# The Parapsychological Association
# 43rd Annual Convention
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# Proceedings of
# Presented Papers

**Kolpinghaus**
**Freiburg, i. Br.**

**Fiona Steinkamp**
**Program Chair**

# The Parapsychological Association
# 43rd Annual Convention

## August 17 – 20, 2000
## Kolpinghaus
## Freiburg i. Br., Germany

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## Acknowledgements

This year's Parapsychological Association Convention also marks the 50th birthday of the Institut für Grenzgebiete der Psychologie und Psychohygiene e.V.(IGPP). I have had the good fortune to be based in Freiburg whilst acting as Program Chair and I am indebted to the IGPP for providing me with a research assistant - Gunda Wössner - to do virtually all of the desktop publishing for the *Proceedings*. The fruits of her labour you can now see as you read. She has done a wonderful job so I would like to give her some special thanks.

A large number of papers were submitted this year which presented some additional challenges. The referees were particularly efficient and thorough with some of them having to referee five or more papers. Thus this year these people too deserve an extra acknowledgement. My advisory committee helped me to solve other difficulties that arose and to advise me on issues such deciding who to ask as invited speaker(s). I have greatly benefited from their variety of views and I would like to thank them for their careful and considered opinions on these matters.

More importantly, there are two people on whom I have relied greatly as informal advisors and who have no credit on the title page. Therefore I would like to take this opportunity to thank them in writing - they are Richard Broughton and Bob Morris. Eberhard Bauer and Kathy Dalton, who are acknowledged on the title page, also deserves to be mentioned in this respect. These four people have saved me from making many errors that fortunately never saw the light of day.

Finally, the arrangements committee have done a great job in organising the conference - there is a lot of unseen work involved here and I really appreciate their efforts in helping me make this convention a success.

Fiona Steinkamp (Program Chair).

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# NEUROPHYSIOLOGICAL AND PSYCHOLOGICAL ASSESSMENT OF AN INDIVIDUAL EXPERIENCING ANOMALOUS MENTAL PHENOMENA: A SECOND CASE STUDY[1]

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## ABSTRACT

Brain electrical activity (19 channels EEG) data were recorded during baseline conditions, psi tasks, and control periods from BSJ, a 53 year-old female subject who has reported previously experiencing anomalous mental phenomena. The raw eyes-closed baseline data were edited for artifacts and then compared to Sterman's adult normative database. The results of this analysis show positive statistically significant deviations from the reference database in the Sensory Motor Rhythm (12-14 Hz), Beta1 (15-18 Hz), and Beta2 (18-24 Hz) bands. This suggests that BSJ has a more active mind and experiences a higher state of physiological arousal than other adults during this condition. Paired *t*-tests were computed on the psi data for the first remote viewing trial and its associated control period. The magnitude and peak amplitude means for each artifact-free epoch for nineteen different electrode sites and for four different frequency bands (delta, 0-4 Hz; theta, 4-8 Hz; alpha, 8-13 Hz; and beta, 13-20 Hz) were compared. The results of the *t*-tests indicate that BSJ has increased electrical activity in the frontal and temporal regions of the left hemisphere, indicative of increased cognitive activity in these regions during the remote viewing trial. The finding of beta activity in the left frontal region, F7, also corresponds with a previous finding by Alexander of activity in this same area by another selected subject during a psi task. A psychological assessment of BSJ and prior research suggests that the following are associated with individuals who score well on laboratory tests of psi: a belief in psi and a belief in scoring well on a laboratory test of psi, prior psi experiences, practice of a mental discipline, participation in creative activities, a Myers-Briggs Type Indicator NF (intuitive/feeling) or NFP (intuitive/feeling/perceiving) categorization, a high score on the Complex Partial Epileptic Sign scale, and a high score on the Highly Sensitive Person questionnaire. The results presented in this paper are exploratory results based on a single subject. Further research with other selected subjects using these same analysis techniques will be required to determine if these results can be replicated.

This case study, of gifted subject BSJ, is considered exploratory research and was undertaken as part of a larger, ongoing data collection effort involving topographic brain mapping of gifted subjects during remote viewing trials. BSJ was recommended for psi testing because of her many different acclaimed psi abilities, and subsequently participated in two days of electroencephalographic (EEG) and psi testing at The Institute for Parapsychology in Durham, North Carolina.

Eyes-open and eyes-closed EEG baseline data were collected from BSJ for comparative purposes with a normative reference database. EEG data were also collected from BSJ during the following psi tasks and their respective control periods: remote viewing, automatic writing, and during a "laying on of hands" healing. These data were collected in order to determine the dominant brain electrical activity during different psi tasks. Additionally, these data were obtained to ascertain if various parameters of the dominant brain electrical activity could differentiate the psi task periods from their respective control periods. The methods, procedures, and data analyses used in this case study were similar to and an expansion upon those used in previous work with selected subject Sean Harribance (Alexander, 2000; Alexander, Persinger, Roll, & Webster, 1998).

[1] This research was conducted at the Institute for Parapsychology.

## METHOD

### *Participant*

BSJ, a very friendly, well-educated woman, resides in the United States and teaches special education children and regular education dyslexic children. She reports having many different psychic abilities, which include, but are not limited to, healing, automatic writing, intuitive readings, channeling the dead, energy work, psychic readings of photographs, and psychometry.

As a young child, BSJ had out-of-body experiences and recognized these as such at the age of eight or nine. Around the age of ten, both BSJ and her brother had what she calls "The Knowing" -- they both knew information they could not have known about with only the use of their normal senses. When BSJ was eleven, she experienced a very difficult year and to this day does not completely understand what she was going through at that time. However, she does feel that she experienced some type of transition at that age. She reports that she was living at a Catholic convent when she experienced this transition, but that she had lived with the nuns off-and-on for a period of four years during her childhood.

The gift of healing first came to BSJ when her husband became ill in 1978. Then six years ago, after the death of her husband, BSJ says she began to have many experiences. For example, the morning after the night her husband died, BSJ describes the room she was in as being filled with a cloud. She actually had to touch the walls of the room to make sure that she was in her mother's house. BSJ interpreted the cloud as a message from her husband that he was in heaven and that he was fine.

BSJ reports seeing other peoples' angels, although she says she doesn't really "see" them with her eyes. However, she says that her father was able to see other forms. Also, she reports that her mother was very intuitive and that her aunt on her mother's side had the ability to heal.

Four years ago, BSJ began automatic writing. Almost always, BSJ performs automatic writing while she is alone. She feels that it is important to be alone as this eliminates energies she picks up on in the presence of others. She views the writings as sacred writings that contain messages which are specific and important to the individual for which the writing pertains. Interestingly, she notes that during automatic writings she does not literally dot her "i's" or cross her "t's." She also feels that her automatic writings are of a very different nature than her psychic readings.

### *Procedures*

#### *EEG Recording Procedure*

EEG data were recorded from 19 electrodes pre-positioned in an elastic skullcap according to the International 10-20 system. A forehead ground was used, and reference electrodes were applied to the left and right earlobes and linked. 10-20 electrode gel was applied to the electrodes and impedances for all electrodes were kept below 5 K ohms. The sampling rate was 128/sec. The 2 HZ cutoff high pass filter was not enabled. Data were acquired using Lexicor's NeuroSearch-24C™ data acquisition unit.

#### *EEG Data Collection*

EEG data were collected from BSJ during two days of testing. Eyes-open and eyes-closed baseline data were recorded on both days prior to psi testing. On the first day of testing, data were collected during an automatic writing task, a writing task control period, a remote viewing trial, and a remote viewing control period.

The second day of psi testing consisted of EEG data collection during a "laying on of hands" healing, three remote viewing trials, and two remote viewing control periods. A remote viewing control period was inadvertently skipped for the second trial.

For each task, BSJ was seated in a comfortable chair at a small table while the EEG data were acquired. During the automatic writing task, BSJ wrote on several sheets of paper a message for the author that BSJ felt was being relayed to her. For a control task, BSJ was asked to write a story. During the four remote viewing trials,[2] BSJ documented her impressions about a remotely located computer-generated target by writing and sketching what she saw in her mind's eye. After the remote viewing trial was completed and judged, BSJ was shown the target picture. For an associated control task, she was asked to write and sketch a description of the target picture she had just been shown. During the "laying on of hands healing," BSJ held her hands over the author's right arm. The author had been experiencing muscle weakness in particular muscles in this arm. The author did not relay this information to BSJ, but just asked BSJ to perform a healing on this arm. A control period for this task was not recorded, since one could not be determined. One to ten minutes of data were collected for each different condition, depending upon the amount of time it took to complete each task.

*EEG Data Analysis*

*Normative Database Comparison of Baseline Data*

The raw EEG eyes-closed baseline data were analyzed using Sterman's Skil (Sterman, 1998) software. This software package accepts raw EEG data acquired using the Lexicor 24C acquisition unit. However, the software requires that its own artifact rejection system be used. Therefore, the raw data were subjected to the software's automatic artifact detection program that identified and marked eye blink and movement artifacts. Additionally, the data were visually inspected and any residual undetected artifacts were manually deleted. The corrected EEG data were analyzed for frequency content using the Fast Fourier Transform. Spectral maps, individual frequency band topometric analysis, topographic maps, and data tables were used to evaluate these data. Statistical analysis compared BSJ's data with Sterman's adult normative database corrected for significant time-of-day variations.

*Psi Task Data*

For each trial, Lexicor's automatic artifact detection program was used to delete epochs containing artifacts. Following this procedure, the raw EEG records where visually inspected and any remaining epochs containing undetected muscle or eye movement artifacts were deleted.

The artifact-free epochs were imported into Lexicor's Exporter (Nahum, 1996) utility software and reports of quantitative EEG parameters were produced. The reports of magnitude and peak amplitude were exported to Excel spreadsheets and the data were analyzed using Systat, a statistical software program. The reports indicated the microvolts of magnitude and peak amplitude for each artifact-free epoch for the nineteen different electrode sites and for four different frequency bands (delta, 0-4 Hz; theta, 4-8 Hz; alpha, 8-13 Hz; and beta, 13-20 Hz). Paired *t*-tests were computed on the data for the first remote viewing trial and its associated control period as this trial produced a direct hit and contained the least amount of artifacts. In order to keep an equal sample size for data analysis purposes, the first 15 artifact-free epochs (30 seconds) for the first remote viewing trial and the first remote viewing control period were compared.

[2]The remote viewing protocol, testing program and target pool that was used was developed by Dr. Ed May (May, Spottiswoode, & Faith, 2000).

## INDIVIDUAL DIFFERENCES MEASURES

*Participant Information Form*

The Participant Information Form (PIF) consists of 30 questions and is a modified version of that used at Honorton's Psychophysical Research Laboratories. The PIF is used to gather general information on subjects, including demographic data, as well as information regarding their psi experiences, and their attitudes and beliefs about psi.

BSJ was given the PIF to complete in order to assess if her responses would be similar to those given by selected subjects in the CL1-Ganzfeld study (Alexander & Broughton, 1999).

*Myers-Briggs Type Indicator*

The Myers-Briggs Type Indicator (MBTI) is a personality assessment tool that identifies people's basic preferences in regard to perception and judgment (Myers & McCaulley, 1985). The MBTI is comprised of four separate indices: Extraversion-Introversion (EI), Sensing-Intuition (SN), Thinking-Feeling (TF), and Judgment-Perception (JP). Preference scores are calculated for each index and indicate which pole of an index a person prefers (e.g., (T) thinking, or (F) feeling). Because the preference scores for each index are independent, there are sixteen possible combinations or "types" which are represented by the four letters derived from the preference scores (e.g., INFP, ESTJ).

BSJ completed Form G of the MBTI, which consists of 126 multiple-choice questions. Based upon her responses to the questions, preference scores for the four indices and an MBTI type were calculated.

The MBTI was administered to BSJ in order to determine if BSJ's MBTI type contains the indices that previous research (Honorton, 1997; Palmer 1998) indicates are associated with positive scores in a psi task.

*Triangle Personality Inventory*[3]

The Triangle Personality Inventory (TPI) is a 50 item questionnaire which measures: (a) the degree to which people become internally absorbed in events, and (b) "complex partial epileptic signs" which may be associated with, among other things, different kinds of paranormal or "dissociated" experiences. The TPI is comprised of two different scales, and items from these two scales are mixed together on the TPI in random order. The first scale (34 items) is called the Tellegen Absorption Scale (TAS), developed by Dr. Auke Tellegen. In general, the scale measures the degree to which people become internally absorbed in events, particularly in their own thought processes. An example would be getting so totally absorbed in a good novel that you don't hear the telephone ring. To use Dr. Tellegen's own words: "Absorption appears to represent a disposition to enter under conducive circumstances psychological states that are characterized by marked restructuring of the phenomenal self and the world. These more or less transient states may have a dissociated or an integrative peak-experience-like quality. They may have a 'sentient' external focus, or may reflect an inner focus on reminiscences, images, and imaginings" (Tellegen, 1982).

Scores obtained from the Tellegen Absorption Scale (TAS) are compared to data collected from large samples of college students. Thus if a TAS score is "very high", it means that the score is very high compared to the average score of this group.

The second scale (16 items), developed by Dr. Michael Persinger (Persinger & Makarec, 1993) is designed to measure what he calls "complex partial epileptic signs" (CPES). Whereas very high scores on the scale are obtained by those who have experienced epileptic seizures, Dr. Persinger maintains that similar

[3] This information on the Triangle Personality Inventory scales was written by Dr. Palmer (with minor paraphrasing by Alexander for this paper), and is the basic text to a result sheet he developed to provide participants with feedback.

patterns occur in many people who are not epileptic. Specifically, Persinger believes that many of us are prone to varying degrees to "micro-seizures" in the temporal lobes of our brains that might be associated with, among other things, different kinds of paranormal or "dissociated" experiences. Therefore, a high score on this scale does NOT mean that an individual has epilepsy or some other neurological disorder.

Scores on the Complex Partial Epileptic Scale are compared to those of a large group of college students. Data indicate that scores on the scale are not influenced by either sex or age.

Listed below are score ranges for both of the scales within the TPI:

Table 1
SCORE RANGES FOR THE TPI SCALES

| TAS | | CPES | |
|---|---|---|---|
| Very High: | 31-34 | Very High: | 12-16 |
| High: | 26-30 | High: | 8-11 |
| Average: | 15-25 | Average: | 3-7 |
| Low: | 10-14 | Low: | 0-2 |
| Very Low: | 0-9 | | |

BSJ was given the TPI to complete in order to assess if she would score in the high or very high range on both of these scales.

*Highly Sensitive Person Questionnaire*

The Highly Sensitive Person (HSP) questionnaire is a short questionnaire (27 questions) developed by Dr. Elaine N. Aron (1998). This questionnaire measures what Aron calls the trait of high sensitivity. A person who is classified as highly sensitive (as assessed by his or her responses to the questionnaire) can be described as follows[4]:

You are a highly sensitive person, a group encompassing 20% of the population. Throughout your life, you have probably been referred to as high-strung, nervous, or even timid. Any new or prolonged stimulation affects you more strongly than those who are not highly sensitive. Noise and light can have a noticeable affect on you, as can hunger and thirst. Being so sensitive to external stimuli, you are more susceptible to stress-related and psychosomatic illnesses. This high sensitivity tends to lead a person to focus more on the internal than on the external. You can be highly intuitive and often "just know" something without knowing how. Right-brained and less linear thinkers, highly sensitive people are able to concentrate deeply, although they work most effectively without distractions, and are highly conscientious in their work.

This questionnaire was administered to examine the idea that gifted psychics or selected subjects are highly sensitive people (HSPs). The rationale behind this idea is that gifted psychics have access to psychic

[4] Ms. Alixe Steinmetz, a Duke work-study student who assisted me at The Institute for Parapsychology, wrote this description based upon information from Elaine N. Aron's book (Aron, 1996). This description was used on a result sheet we developed to provide participants with feedback on the Highly Sensitive Person questionnaire.

information more than their counterparts because being highly sensitive to their environment, and external and sensory stimuli, predisposes them to the ability to obtain and recognize psi "stimuli". Thus it was anticipated that BSJ would be classified, according to this scale, as a highly sensitive person.

## RESULTS

*Participant Information Form*

Following is a synopsis of information obtained from the Participant Information Form

BSJ, a right-handed, Caucasian female, was 53 years old at the time of testing and was employed as a teacher. She had not previously participated in formal laboratory testing of psi phenomena, but was recommended for testing by a prior selected subject who was aware of her abilities. BSJ believed that she would likely score above chance in formal laboratory psi tests, and she acknowledged a very strong belief in psi phenomena. In addition, she reported having often had experiences that she thought involved ESP, as well as having frequently experienced coincidences.

When asked about the practice of any form of mental discipline, such as meditation, biofeedback, hypnosis, or relaxation exercises, BSJ reported having practiced meditation both currently and in the past. Within the last five years, BSJ indicated that she had not taken part in any type of self-improvement program such as Transcendental Meditation, psychotherapy, or the Silva Method, but had practiced the physical regimen of tai chi.

When asked, "Which of the following best describes the way you think, visually (images) or verbally (words)," BSJ answered verbally. She also answered that she often has experienced intense smells that do not have an obvious source.

BSJ reported that she never recalls the specific contents of her dreams, and only once or twice has ever had a dream in which she was aware she was dreaming, or in which she felt as though she were floating or flying through the air. Additionally, BSJ indicated that she rarely daydreams, and that she does not enjoy activities that require an involvement in fantasy. However, she did claim that she almost always becomes so absorbed in an activity that she loses awareness of her surroundings, as well as her sense of time. She acknowledged that it has been important to her to participate in creative activities such as music, art, or creative writing.

In addition, BSJ noted on the PIF that she has a masters degree, and that at the time of testing was not on any prescription or nonprescription medications.

*Other Individual Measures*

BSJ was classified based on her Myers-Briggs Type Indicator (MBTI) preference scores as MBTI type ENFP (extroverted, intuitive, feeling, perceiving). According to her responses on the Triangle Personality Inventory (TPI), she was classified as having an average score on the Tellegen Absorption Scale (TAS), and as having a high score on the Complex Partial Epileptic Signs (CPES) scale. BSJ is also considered a highly sensitive person, based upon her responses to the Highly Sensitive Person questionnaire.

*Psi Tasks*

The remote viewing trials were used as a means of measuring psi in the laboratory. Although BSJ had never participated in remote viewing trials, she scored two direct hits, a second rank hit, and a third rank hit (N=4) for a continuity corrected $ES$=0.795 (z=1.59, $p$=.056).

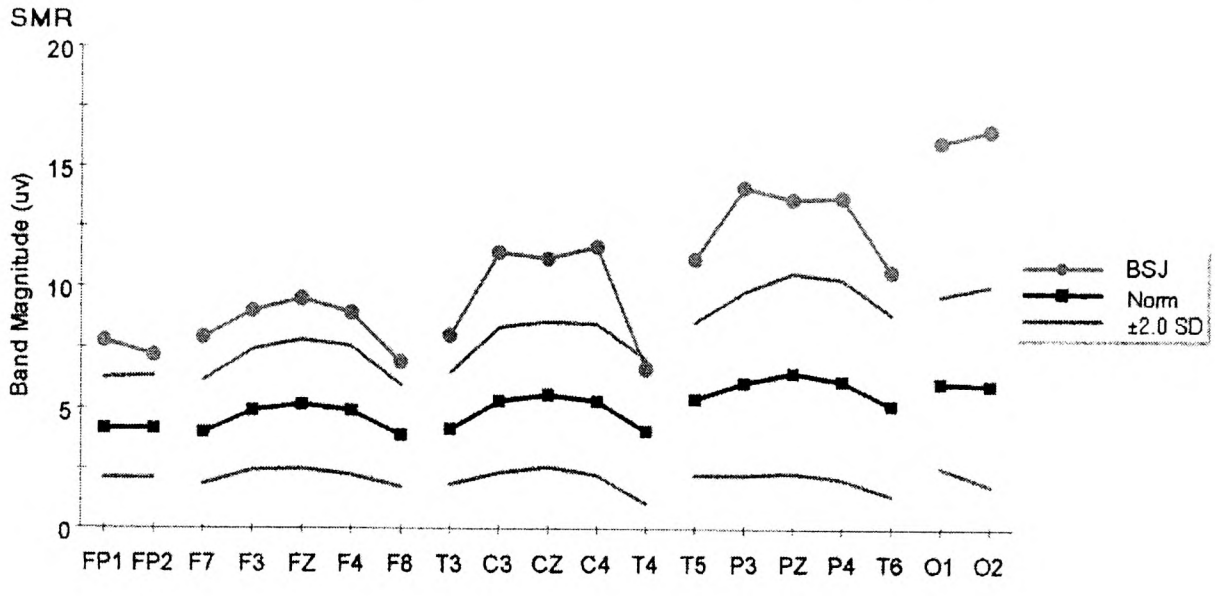
The automatic writing task and the healing task was not objectively measured for psi phenomena, as this would have been very difficult, if not impossible to do. Therefore, EEG measures were obtained from BSJ during these tasks in order to determine if there was a particular brain state associated with these psi tasks regardless of whether or not it could be demonstrated that psi occurred during the tasks. These data were not analyzed for this paper.

*EEG Results*

*Normative Database*

Topometric statistical analysis comparing BSJ's eyes-closed baseline data, recorded on the first day of testing[5], with the SKIL software's adult normative database indicate positive statistically significant deviations in the delta, 1-4 Hz range; SMR, 12-15 Hz range (see Figure 1); Beta1, 15-18 Hz range (see Figure 2); and Beta2, 18-24 Hz range (see Figure 3). Note that BSJ's data is statistically significant for all 19 electrodes in all three plots, except for electrode T4 in the SMR range (Figure 1) and the Beta1 range (Figure 2). Because the EEG data were recorded with the high pass filter off, and since there was an absence of high amplitude, slow wave activity present in the raw EEG record, the delta activity is interpreted as artifact and the topometric plot is not shown.

Figure 1
TOPOMETRIC PLOT OF 12-14 HZ ACTIVITY (WITH EYES CLOSED)
MEASURED IN MICROVOLTS ACROSS 19 ELECTRODES




[5] The results of the eyes-closed baseline data recorded on the second day of testing have been excluded and are not reported herein as they contained too many artifacts to provide a meaningful analysis.

Figure 2
TOPOMETRIC PLOT OF 15-18 HZ ACTIVITY (WITH EYES CLOSED)
MEASURED IN MICROVOLTS ACROSS 19 ELECTRODES

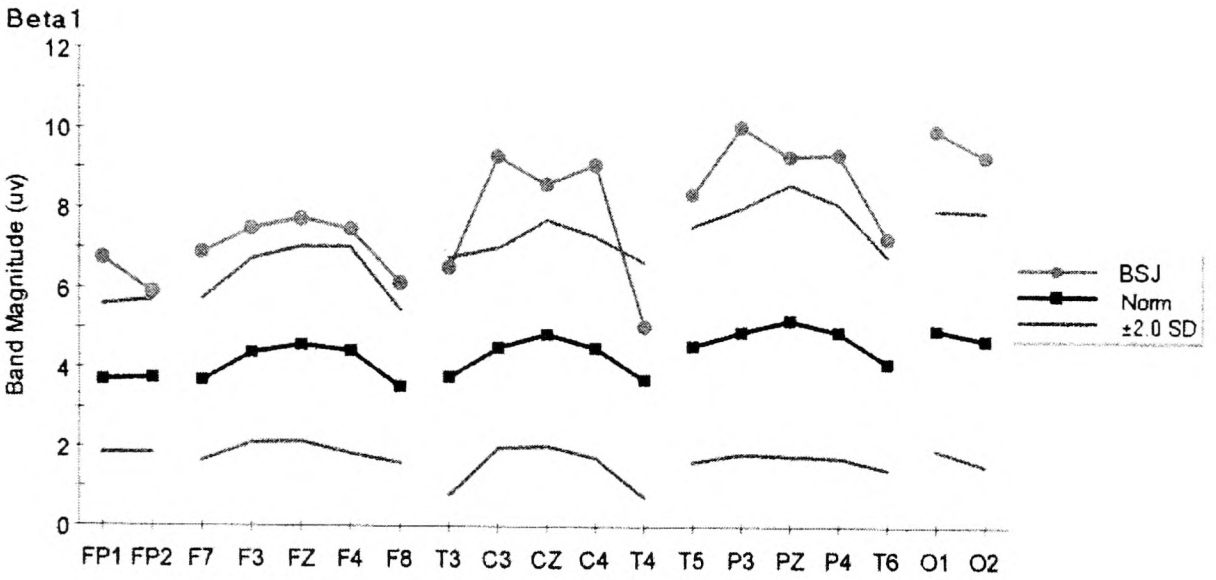
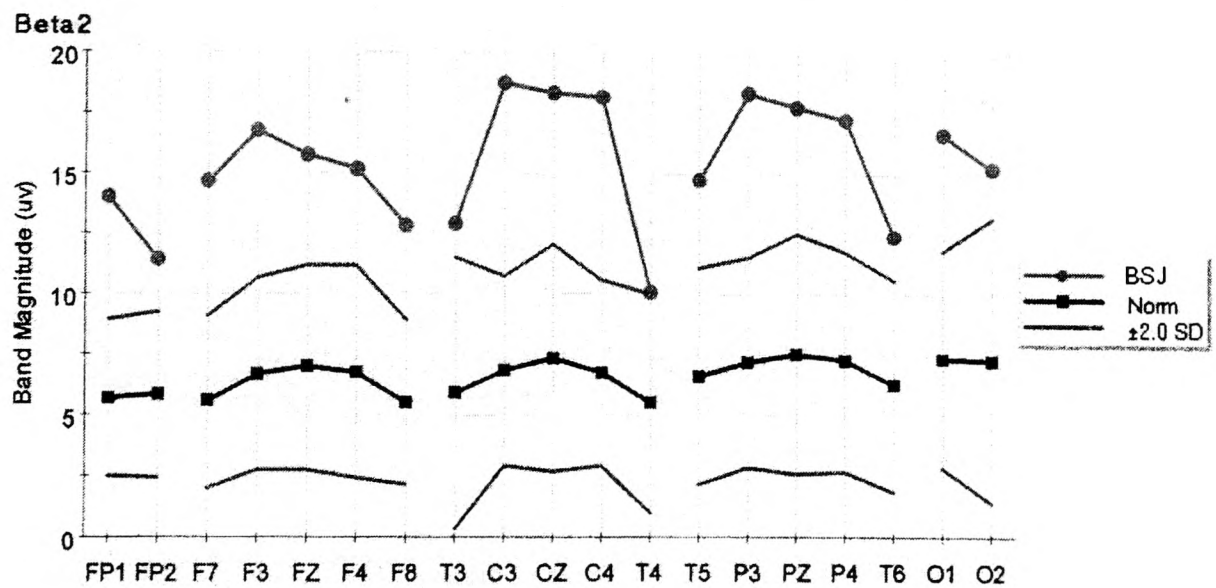



Figure 3
TOPOMETRIC PLOT OF 18-24 HZ ACTIVITY (WITH EYES CLOSED)
MEASURED IN MICROVOLTS ACROSS 19 ELECTRODES



*Remote Viewing Data*

Results of the paired *t*-tests between the means of the peak amplitudes at the 19 different electrode sites for the first remote viewing trial and its associated control period are given in Table 1 where statistically significant differences ($p<.05$) were obtained. The means for these electrodes were higher for the remote viewing trial than for the control period.

Table 1

PEAK AMPLITUDE DIFFERENCES BETWEEN THE REMOTE VIEWING TRIAL AND THE REMOTE VIEWING CONTROL PERIOD

| Electrode Placement | Frequency Band (Hz) | Mean Difference | SD Difference | df | *t* | *p* |
|---|---|---|---|---|---|---|
| F1 | Alpha (8-13) | 0.249 | 0.358 | 14 | 2.696 | 0.017 |
| F2 | Alpha (8-13) | 0.214 | 0.286 | 14 | 2.893 | 0.012 |
| T3 | Alpha (8-13) | 0.413 | 0.380 | 14 | 4.204 | 0.001 |
| T4 | Alpha (8-13) | 0.359 | 0.618 | 14 | 2.251 | 0.041 |
| F7 | Beta (13-20) | 0.351 | 0.470 | 14 | 2.897 | 0.012 |
| T4 | Beta (13-20) | 0.976 | 0.851 | 14 | 4.441 | 0.001 |

Results of the paired *t*-tests between the means of the magnitude at the 19 different electrode sites for the first remote viewing trial and its associated control period are given in Table 2 where statistically significant differences ($p<.05$) were obtained. The means for these electrodes were higher for the remote viewing trial than for the control period, except for electrode T3.

Table 2

MAGNITUDE DIFFERENCES BETWEEN THE REMOTE VIEWING TRIAL AND THE REMOTE VIEWING CONTROL PERIOD

| Electrode Placement | Frequency Band (Hz) | Mean Difference | SD Difference | df | *t* | *p* |
|---|---|---|---|---|---|---|
| T3 | Theta (4-8) | -1.047 | 1.664 | 14 | -2.437 | 0.029 |
| O1 | Alpha (8-13) | 2.150 | 2.851 | 14 | 2.921 | 0.011 |
| T3 | Alpha (8-13) | 2.131 | 2.456 | 14 | 3.361 | 0.005 |
| T4 | Alpha (8-13) | 1.637 | 2.477 | 14 | 2.559 | 0.023 |
| F7 | Beta (13-20) | 1.903 | 3.303 | 14 | 2.231 | 0.043 |
| T3 | Beta (13-20) | 4.025 | 5.288 | 14 | 2.948 | 0.011 |

## DISCUSSION

The results of the four remote viewing trials show that BSJ, who had acclaimed abilities of psi, was able to perform well on laboratory tests of psi. Data from the Participant Information Form (PIF) indicates that BSJ met the inclusion criteria used by Alexander to select potentially high-scoring subjects for the CL1-Ganzfeld study (Alexander & Broughton, 1999). The inclusion criteria were: believing in psi, having had prior ESP experiences, having practiced a mental discipline, and having participated in creative activities. BSJ did not meet the exclusion criteria in that she believed that she would score above chance in laboratory tests of psi phenomena and she was not taking psychotrophic medications. This suggests that the PIF inclusion and exclusion criteria used by Alexander in the CL1-Ganzfeld study in which good ESP scores were obtained (Alexander & Broughton, 1999) is useful for the selection of talented subjects.

BSJ's classification as Myers-Briggs Type ENFP is consistent with the finding by Honorton (1997) that subjects classified as FP showed significant performance in an ESP experiment. It is also consistent with Palmer's finding (1998) that the classification NFP is associated with ESP hitting. This suggests that the MBTI could be used as a prescreening device for the selection of talented subjects using categorization as NF or NFP as selection criteria.

According to her responses on the Triangle Personality Inventory (TPI), BSJ was classified as having an average score on the Tellegen Absorption Scale (TAS). This does not correspond with the idea that people who have high ESP scores will score high or very high on this scale. However, BSJ's score in the high range on the Complex Partial Epileptic Signs (CPES) scale does correspond with the idea that people who score high or very high on this scale are more likely to report experiences of anomalous mental phenomena. BSJ is also considered a highly sensitive person, based upon her responses to the Highly Sensitive Person (HSP) questionnaire. This lends support to the idea that psychics tend to be more sensitive to their environment and have a more sensitive nervous system than those who are not considered psychic.

The results of a topometric analysis of BSJ's eyes closed baseline data with a normative reference database indicate that BSJ has significantly more SMR, Beta1, and Beta2 activity present than one would expect to see in an adult without neurological problems. This suggests that BSJ has a more active mind and experiences a higher state of physiological arousal than other adults. This is consistent with BSJ's HSP questionnaire results.

During the remote viewing trials, BSJ had higher peak alpha amplitudes in the frontal and temporal regions, and higher peak beta amplitudes in the left frontal region and the right temporal region than during the control period. Magnitude in the alpha band was higher in the temporal regions and the left occipital region, while magnitude in the beta band was higher in the left frontal region (F7) and the left temporal region (T3) during the remote viewing trial than during the control period. These results indicate increased activation of the left hemisphere (frontal and temporal regions) during the remote viewing trial. The finding of beta activity in the left frontal region, F7, corresponds with the finding by Alexander (2000) of activity in the same area by another selected subject during a psi task. Previous findings by McDonough, Don and Warren (McDonough, et al., 1989, Don, et al., 1990, & Don, et al., 1992) also indicate involvement of EEG activity in the temporal sites in psi performance.

The results presented in this paper are exploratory results based on a single subject. Nonetheless, the consistency of BSJ's results on the personality assessments with other subjects who have scored well in laboratory ESP tests suggests traits that may help identify psychically talented individuals. EEG data analysis results point to the left frontal region, the temporal regions, and the beta band as being more active than other regions or bands during a successful psi task as compared to a control period. Further

neurophysiological research with other selected subjects using these same analysis techniques will be required to determine if these results can be replicated.

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# COUNSELING AND THERAPY FOR PEOPLE WHO CLAIM EXCEPTIONAL EXPERIENCES

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## ABSTRACT

Every year about 400 people from all over Germany who claim exceptional experiences approach the "Institut für Grenzgebiete der Psychologie und Psychohygiene e.V." (IGPP) in Freiburg asking for advice and help in order to find explanations and means of coping for these experiences.

In April '96 the research project "Counseling and Help for People who claim Exceptional Experiences" was brought into being by the outpatient service of the Psychological Institute of the University of Freiburg and the IGPP with the purpose of meeting these counseling needs with a professional counseling approach. The objective of this research project is the development, implementation and evaluation of an empirically based clinical approach for people who claim these experiences and are irritated by them.

The research group considers the term "Exceptional Experiences" as a collective term, including occurrences such as recurrent spontaneous psychokinesis, passivity experiences, telepathy, clairvoyance, appearances or apparitions, extrasensory perceptions such as precognition, unusual dreams, experiences with occultism, spiritualism or alternative-esoteric practices as well as exceptional experiences in the context of meditation, yoga etc

The presented paper discusses the relevance of these experiences for the average population. Different models trying to explain the development of paranormal beliefs are presented and role of dissociation as a possible key concept for the understanding of exceptional experiences is discussed. The need of counseling for people who claim exceptional experiences and as a result eventually develop emotional problems is illustrated by referring to the latest results of the research project. These results show who claims exceptional experiences and of what kind these experiences are, which people seek information or need counseling or therapy, how many of them can be classified as being mentally disturbed and how the counselors deal with these requests.

The relevant data is collected by means of a special documentary system, developed by the research group which, in addition to transcripts of the counseling sessions, serves as the main source of information. According to these data, half of the people who look for advice can be classified as having a psychological disorder because of the stated symptoms and problems, 45 % report experiences with psychiatry or/and psychotherapy.

In the theoretical and practical guidelines of the developed counseling approach clinical-psychological and parapsychological knowledge are integrated. To avoid early labeling the counselors respect exceptional experiences for what they are, narratives of a truly exceptional experience. Beyond that the counselors consider it important to dedramatize and demythologize the experience. This helps the client to integrate the experience into the client's concept of the self and the world. A further goal of the counseling process is to enhance the flexibility in the cognitive connections to allow not only paranormal but also normal explanations for the exceptional experiences. Regaining self-control and perspective is another counseling goal since many of the clients (26%) feel influenced by external forces or other persons. On the basis of the results of a specially developed evaluative questionnaire which is sent to all clients who received some kind of counseling the actual counseling approach and model will be developed further.

## INTRODUCTION

In this lecture I attempt to find an adequate conceptualizisation for the term Exceptional Experiences especially in the context of counseling. Having defined what we mean by exceptional experiences, I will discuss the relevance of these experiences for the average population. Then I will turn to different models

trying to explain the development of belief in the paranormal and report factors that are likely to contribute to both exceptional experiences and a corresponding belief system. In order to illustrate the need for counseling people who claim exceptional experiences and who eventually develop emotional problems as a result. I will refer to the latest results of our research project. They will show who claims exceptional experiences and of what kind, which people seek information and need counseling or therapy, how many of them can be classified as being mentally disturbed and how we deal with these requests.

## CONCEPTUALIZING EXCEPTIONAL EXPERIENCES

### *Definition of Exceptional Experiences*

In the literature we find terms like "transpersonal", "paranormal", "parapsychic", "spiritual", "mystic experiences" or "transcendence experiences" - to name just a few - which are used to describe happenings, whose quality, onset and progression apparently do not fit into our conventional framework.

Today no standardized, generally accepted definition exists for these terms. Their use differs tremendously according to the beliefsystem or worldview which defines them. All these terms have in common the fact that those individuals who encounter them can't really explain them and can't integrate them into their conception of the world and the self. As a consequence they are refered to as psychic, transcendental, supernatural, mystic, paranormal, psi, spiritual, mystic, transpersonal etc.

In order not to increase the confusion on the one hand and to avoid the amalgamation of these experiences with aspects of mental disorders on the other, we use the term Exceptional Experiences" (EE). This conceptualisation respects the special quality that accompanies these experiences without giving prior judgemental diagnoses or unjustified labels.

Therefore the term "Exceptional Experiences" is considered as a collective term. It includes occurrences such as recurrent spontaneous psychokinesis (RSPK), passivity experiences, telepathy, clairvoyance, appearances or apparitions, extrasensory perceptions (ESP) such as precognition, unusual dreams, experiences with occultism, spiritualism or alternative-esoteric practices as well as experiences in the context of meditation, yoga etc.

### *Phenomenology of exceptional experiences*

In accordance with the trigger mechansim of the exceptional experiences we can put them into three basic categories:

- *Spontaneous* experiences (not deliberately instigated, e.g. synchronicity, meaningful coincidence of events, precognitive dreams, clock cases, poltergeist cases etc.)
- *Self-induced* experiences (phenomena that are voluntarily induced by the persons themselves by means of occult practices etc.)
- *Externally induced* experiences (including the work of psychic healers, fortune tellers, paragnosts, hypnotists etc.)

This distinction helps us to classify and understand these experiences with regard to factors such as estimated internal vs external control, motivation for and function of the experience and the context of the experience, all of which are relevant factors for advice and help.

Exceptional experiences can happen once or several times and are not necessarily problematic. People affected by these experiences react quite differently. Some experience these events positively and assimilate them quite well. Others feel irritated and confused. These experiences may also set off deep anxieties and worries or the feeling of loosing control.

Evidence for the epidemiological spread of reports about such experiences can be found in studies by Greely (1975), Palmer (1979), Haraldsson (1985), Clarke (1991), Haraldsson & Houtkooper (1991), Sobal & Emmons (1982) and recently Knoblauch (1999). An important source of information is the "Multinational Human Values Study" that was conducted on large representative samples in 13 European countries, the U.S. and South Corea. Cross-national comparisons of the frequency of reports of various exceptional experiences and beliefs (Haraldsson & Houtkooper, 1991) show that 46% in Europe and 60% in the US report having had a paranormal experience (telepathy, clairvoyance, contact with the dead etc.). According to Gallup poll data (Sobal & Emmons, 1982) the majority of the American population believes in one or more paranormal phenomena. 1/6 of the German population claim exceptional experiences in the context of a near-death-experience (Knoblauch, 1999).

All in all we find that there exists a wide range of numbers depending on the cultural or subcultural background of the sample, the way of questioning, the kind of phenomenon and whether people report that they believe in the existence of the paranormal or if they claim own exceptional experiences which they call paranormal.

*Correlates of paranormal belief and exceptional experiences*

Within the last twenty years a considerable amount of research has been undertaken to find out significant correlates between paranormal belief, exceptional experiences and personal characteristics. So far we don't know if it is necessary to experience something exceptional in order to develop a paranormal belief system or if it is the other way around, i.e. if it is necessary to believe in the paranormal already in order to be able to explain and understand exceptional experiences as paranormal. Maybe both ways of developing and maintaining a paranormal belief system are possible.

Parapsychologists have always seen it as their main task to find firm direct evidence for paranormal phenomena. But this is only half the story. Irrespective of the results of the debate on the reality of the paranormal, it is relevant to find out more about the question why some individuals are more prone to exceptional experiences and why they react differently to these experiences. So what we should do is look at the empirically found results between paranormal belief, exceptional experiences and different personal characteristics.

According to Irwin (1993) you can seperate the results into four sections: demographic correlates, other belief systems, cognitive variables, and dimensions of personality. Research that has been done in the section on *demographic correlates* of paranormal belief is mainly based on testing the marginality hypothesis, which claims that members of social marginal groups are the people who are most susceptible to paranormal belief. Research in the field of *other belief systems* is triggered by the idea that paranormal belief goes along with other beliefs that have a subjective and often esoteric basis. Research in the area of *cognitive variables* comes from the cognitive deficit hypothesis which claims that people who believe in the paranormal are uncritical, illogical and irrational in thinking and at best are creative phantasizers. The tested *personality variables* seem to test the hypothesis that people who claim paranormal and exceptional experiences are psychologically deviant and socially withdrawn eccentrics.

As will be shown in a later section of this lecture other models exist in the meantime which are able to explain the results far better and in a much more differentiated way.

What we finally find is that there is no clear picture of who believes in the paranormal but that all kinds of people have paranormal beliefs. This is not surprising when we consider the remarkable epidemiological spread of these beliefs. Perhaps we should be more specific with our questions. This could be done by looking for subgroups, which has been done by differentiating between different dimensions of paranormal

belief. It seems evident that people who, for example, report ESP belief can be characterized by other attributes than people who believe in UFOs or the Loch Ness monster. In the meantime it is clear that the variety of measures used to assess paranormal beliefs are heterogeneous and can be characterized by their lack of consistency. This presents considerable problems for the interpretation of results drawn from the literature since the results of the empirical studies are not really comparable. Measures of paranormal belief range from very narrow (e.g. Sheils & Berg, 1977) to all-encompassing (e.g. Tobacyk, 1988). Furthermore it has been shown that paranormal belief is multidimensional (Irwin, 1993, Lawrence, 1998). This makes it necessary to differentiate between different belief areas in order to be able to make more precise statements for a basis for developing models of the origins and function of paranormal belief.

In my opinion it would also be worthwhile to compare within the group of people who claim exceptional experiences those who who can integrate them well in their world-view and those who are stressed and irritated and therefore look for help and advice.

## MODELS TO EXPLAIN CAUSES, FUNCTION AND CONSEQUENCES OF PARANORMAL BELIEFS AND EXCEPTIONAL EXPERIENCES

On the basis of the core characteristics of the correlational data Irwin (1993) presented a developmental model of paranormal beliefs. In this model he suggests that the factors childhood trauma, need for control, fantasy proneness, and illusion of control over life play a central role in explaining the development and preservation of paranormal belief. According to Irwin, as a consequence of childhood trauma a person develops a strong need for a sense of control and fantasy as a coping strategy. This might also be the case if fantasy in general is encouraged during childhood. So in Irwin's model, fantasy, which for its part is mediated by the cultural and social environment, is the central mediating variable in the development of paranormal belief and experience. Fantasy proneness then will facilitate the development of a paranormal belief system. Irwin suggests that this way a paranormal belief provides the individual with a sense of coping with an otherwise uncontrollable event. The association between paranormal belief and exceptional experiences may be directional or circular. Beliefs might encourage exceptional experiences and experiences might reinforce paranormal beliefs. Irwin's model is one of the first attempts to integrate merely correlational data into a heuristic that is able to include many of the key findings in research.

Lawrence et al. (1995) and Lawrence (1998) tested Irwin's model using covariance structure modeling (CSM) to test the causal structure underlying the relations between childhood trauma, childhood fantasy, paranormal experiences and paranormal belief. Based on three of his own studies, he extended Irwin's original model of the causes and consequences of paranormal belief. According to this Lawrence suggests two routes to the development of paranormal experience: one through fantasy due to the loss of control trauma and one direct route from bereavement related trauma.

One basic problem in Irwin's model can be seen in reducing traumatic experiences to childhood. What we know today is that what people consider as a stressful or even traumatic life-event differs tremendously. As has been shown in the research about post-traumatic stress disorder, traumatic life-events can happen any time during life and are not restricted to childhood and sexual abuse. They encompass experiences such as deprivation as a child, natural disasters, assault, rape, being the victim of a crime or a car accident, loss of home, extreme psychosocial stress etc. (Maercker, 1997; Davidson & Foa, 1993; Wolf & Mosniam, 1990). All these experiences have in common the fact that they are so exceptional that it is difficult to process, organize, make sense of them and "file it in the right drawer" because we don't have a fitting schema. As a consequence exceptional experiences themselves may also be assessed as traumatic events. This might be

true for *spontaneous* experiences like synchronicity, meaningful coincidence of events or precognitive dreams. Moreover for *self-induced* experiences which occur in the context of occult practices. Also *externally induced* experiences which are often connected with altered states of consciousness and can happen when contacting psychic healers, fortune tellers, paragnosts, hypnotists etc. can be assessed like.

An interesting addition to Irwin's model can be drawn from different studies which investigated the relationship between dissociative experiences and paranomal beliefs (Richards, 1991; Irwin, 1994; Steinfurth, 1996; Wolfradt, 1997). The results show that people who hold a paranormal belief system have a tendency to dissociate and have dissociative experiences. Clinical groups show an even stronger relationship between dissociative experiences and paranormal beliefs (Wolfradt & Dorsch, 1995; Wolfradt & Guerra, 1997), but this is not a necessary condition.

In the meantime we also have evidence that absorption (Spiegel & Cardena, 1991), fantasy proneness (Lynn & Rhue, 1988; Lynn & Sivec, 1992), hypnotizability (Frischholz et al., 1992) and imagery (Lynn & Rhue, 1987) are all constructs that are related to dissociation.

As we have already shown before, all these constructs are not only associated with dissociation but are also significantly related to paranormal belief. So what we should do is try to integrate these findings in a model that links up traumatic life events, dissociative (vulner)ability, paranormal beliefs and exceptional experiences. The following dimensions of normal personality function as predictors or mediators are absorption, fantasy proneness, hypnotizeability and imagery.

## DISSOCIATION - A KEY CONCEPT FOR EXCEPTIONAL EXPERIENCES?

If we look at research in the field of exceptional experiences, we can't go further without taking note of research that has been done not only in the area of dissociative disorders, but also normal dissociative phenomena and processes and discuss it in the context of identity and memory. Yet an overview like this can hardly do justice to our current knowledge in such diverse scientific disciplines as memory processing, neurobiology, developmental psychology and the human response to trauma. However I will try to illustrate some of the ideas, which may serve as a guide toward a better understanding of how some of the data may be related and which questions still remain unanswered.

### *Dissociation – order and disorder*

Current theories about memory discarded the idea of the existence of a unified system of recollection. Central to our current understanding of dissociation is the idea that neuronal information processing works parallell, so that processes of encoding and decoding might work separately and finally dissociate to different sensory areas. This includes the idea that there is not necessarily a transference between the different memory systems (Schacter, 1995). Something else we have learned is that especially in traumatic situations implicit and explicit memory systems not only work parallel, but are extensively independent of each other. In periods of stress and absorbed attention memory functions are more or less restricted. In cases of extreme stress explicit memory functions stop working, so that no reproducable information could be learned. This is when dissociation sets in. To what extent dissociative processes influence cognitive mechansims depends on different factors. These are characteristic of the situation (stress or creative absorption), the amount of perceived control (selective unattentiveness or automatic process), characteristics of the people involved (self or others) and individual factors (age, creativity, fantasy proneness, hypnotic susceptibility), and, in case of a stressful event, the duration of the stress (single vs. repeated, short vs. prolonged). For these situations either no explicit memories exist or they are very weak and fragmentary.

Some researchers assume that people have a innate completion tendency (Horowitz, 1986). This is a basic need to integrate new information as well as emotionally unclear perceptions and experiences into existing cognitive-emotional schemata. So in order to be able to integrate dissociative experiences for which we have no explicit memory, we have to make up our own narrative.

At this point it is important to note that dissociation should not only be regarded as a psychopathological disorder but also as a protective factor which enables human beings to survive extremely stressful situations and postpone the processing of overwhelming experiences to the time when the person has recovered from a stressful life-event and the acute information overflow is over. Beyond that we find ample evidence documented by surveys of the general population that dissociative experiences are a familiar part of everyday life (Ross et al., 1990).

This is in accordance with the widely accepted definition of dissociation by Spiegel & Cardena (1991) as "a structured seperation of mental processes (e.g. thoughts, emotions, conation, memory, and identity) that are ordinarily integrated", which says nothing about the pathology or normality of dissociative processes.

Hilgard (1977, 1994) assumes that the capacity for dissociation develops as a normal psychological process and exists as a constitutional predisposition, which contains two different aspects:

- A competence for acting and coping which uses dissociative experiences, especially in complex situations, which are highly routinized while the person focuses on awareness of something else. This can also be observed as dissociated absorption as a flow experience of creative processes.
- A vulnerability to the development of dissociative disorders (e.g. escape into a world of fantasy because of external predicaments and traumatic experience in different aspects of identity).

If we transfer these findings to the area of exceptional experiences we can fulfill a little bit of our own completion tendency and find a heuristic for people who seek help and advice on exceptional experiences.

Based on Irwin's model and the extension of the model by Lawrence we find some evidence that traumatic life events, as well as fantasy proneness, play an important role for the development of a paranormal belief system. Traumata as well as fantasy are processes that are connected with dissociative information processing. This is also true for different dimensions of normal personality like absorption, hypnotizeability and imagery. These aspects might all be connected to a basic constitutional ability to dissociate and the development of a dissociative coping style as a consequence.

So our starting point might be a person with a dissociative (vulner)ability and coping style. If this person is confronted at any time in his life with a frightening or novel experience that does not fit into his existing cognitve-emotional schemes, he will probably try to use dissociation as a coping strategy. If dissociation works, the experience remains unintegrated and can't be explicitly processed and recalled. At the same time we might find people who, in accordance with the empirical work mentioned above, can be described as creative and sensation-seeking and use their dissociative ability in order to generate self-induced or externally induced exceptional experiences. In both instances paranormal explanations might be used to find a narrative for an exceptional experience. A paranormal story can help us to find a way to reproduce memories verbally so that the personal perception recognizes this image and attaches it to other memories. So telling tales of the unexpected might be used by both groups as a strategy to generate a complete story and integrate it in our memory.

Claiming an exceptional experience and describing it with a paranormal world view might therefore serve completion tendency in some instances. The question whether we are especially sensitive when in a dissociative state and therefore in a state of consciousness that enables us for exceptional experience must remain unanswered at this point.

## SPECIFIC EE-COUNSELING

For as long as people have reported exceptional experiences there must have been many who have suffered from these experiences. The emotional problems related to such exceptional experiences were not recognized. Instead they were often classified either as exaggerated behavior or as part of traditional psychiatric patterns and hence treated accordingly.

When dealing with people, who claim EE we usually find an individual who is troubled and confused seeking an explanation of a reported psi experience or coming with the idea that he or she must be a psychic because he is troubled by the explanation of an expert.

Traditionally parapsychologists are research orientated and consider as their main goal to "isolate" phenomena and to obtain evidence for their existence.

In connection with exceptional experiences, the question of factuality is asked quite often by affected lay people as well as health professionals. As of today we can't really answer it. Even if meta-analytic results of experimental parapsychological research or of numerous laboratory-experiments sometimes show significant so-called psi-effects, the effects are so minimal that they are hardly relevant for our every-day-life. That means even if we can prove certain anomalies like precognition or telepathy in the laboratory, this is, at best, of only marginal importance for a single client and their counseling.

On the contrary, I'm convinced that a counselor should not get tangled up with the question whether the clients report is "true" or not . The story we finally hear in the counseling situation can be understood as a subjective reconstruction of personal experiences which are being put in a paranormal context of meaning. So the question we finally have to deal with is what gets what kind of people to the point that they use paranormal models of explanation to categorize personally exceptional experiences. The results of research in memory and identity show that we have to be careful with the stories we hear and eventually provoke in counseling and therapy. We know that it is possible to provoke false-memory-syndrome when asking clients about traumatic life-events. This could also be the case if we insist on hearing stories about exceptional experiences. It seems almost impossible to reconstruct the past and the development of people truthfully. Narratives in counseling and therapy represent much more the current cognitive development and they serve to keep and support a sense of coherence in the present and self-confidence for the future. So, stories about exceptional experiences should be considered as subjective references for our personal past and not as objectively truthful representations of the past.

### *Counseling at the IGPP for people who claim exceptional experiences*

During the last few years the clinical relevance of subjective exceptional experiences has become more and more of an issue (Bauer & Lucadou, 1992; Coly & McMahon, 1993; Solvin et al., 1995). But this is not completely new.

50 years ago the *Institut für Grenzgebiete der Psychologie und Psychohygiene e.V.* (Institute for Border Areas of Psychology and Psychohygiene) was founded by Hans Bender in Freiburg, Germany. As you can tell from the term *psychohygiene* Bender already knew that people who claim exceptional experiences sometimes feel irritated and burdended by these experiences. Bender (1958/1959) already referred in 1958 to the connection between occult practices or spiritualist influences (e.g. Oui-Ja-Board, Automatic writing, Pendulum) and dissociative disorders in his article about mediumistic psychoses. So it has always been one of the Institute's goals to offer help and advice. But it was not before 1992 that a clinical psychologist was employed whose only responsibility it was to offer a counseling service for people seeking advice.

In 1996 our research group "Counseling and help for people with EE" started working. It was specially set up to analyse the counseling demand for people who claim exceptional experiences, to classify

exceptional experiences, to develop an explicit counseling approach and to evaluate the counseling process and outcome.

Today every year about 700 enquiries for information and counseling reach the IGPP from all over Germany. About 350-400 requests are transferred to the counseling department. Half of these clients are taken care of by our research group. The following results refer only to this group of clients. They are typical for the work we do during one year.

Over a period of 12 months from December 1998 until November 1999, 171 people seeking advice were given treatment by the counselors of the research project. The following numbers are based on data, which were recorded by a specially developed documentary system for people who claim exceptional experiences. The results can be regarded as typical for the years from onwards 1996. Since 1996 systematic records have been made with the documentary system and analyzed.

As in previous years 60% of the clients are women and the average age is 39 years.

Table 1 gives an overview of the sociodemographic characteristics of the clients. Because of the setting (mainly telephone counseling, counseling by mail, and a lot of single-session counseling) the data are often times incomplete, so that the number of people included in the analysis differs for most of the variables. The correct frequencies are shown seperately for every table.

As in previous years, the level of education is comparatively high. About half the clients have obtained a high-school diploma, almost one third are university graduates. But less than half of the people seeking advice have a job, one fourth are retired or on incapacity benefit.

In the meantime the clients hear about the IGPP mainly through the internet (22%). Other important media are the press (11%), television (9%) and sometimes through a radio-station. Doctors and psychologists (8%) refer clients to the institute as well as ministers or friends.

63% of the clients use the telephone for their *first* contact with the counseling team, 19% send a letter, 14% of the clients use the internet, 1% use a fax and only 3% just drop by without prior notice. 45% of the people seeking advice used our counseling service just once. The average frequency of the remaining 55% is five contacts (for letters and e-mails we count one correspondence back and forth as one contact). Only 14% of our clients were seen personally either in our advice center or at home.

Altogether there were 570 contacts between counselors and clients during one year. Table 2 shows the proportions of the different types of counseling. The shift towards counseling by letter during the counseling process is due to the fact that after the initial telephone call we often send information material and questionnaires to the clients (47%).

The average time needed for counseling over the telephone or in the counseling center was 68 minutes per client. This is due to the fact that some phone calls may last only five minutes or as long as 38 hours of psychotherapy in one case.

The following results refer exclusively to "genuine" counseling cases. 50 of the 171 cases were enquiries for information only. These are contacts where people only ask for some kind of general or educational information. This is the case when no exceptional experiences or psychosocial problems are reported or the clients are not interested or are unwilling to make it an issue.

Table 1
SOCIODEMOGRAPHIC DATA

| | % |
|---|---|
| **Religion (N=52)** | |
| Protestant | 25 |
| Catholic | 33 |
| Other | 11 |
| None | 31 |
| **Marital Status (N=87)** | |
| Single | 50 |
| Married | 34 |
| Divorced | 14 |
| Widowed | 2 |
| **Domestic situation (N=84)** | |
| Alone | 43 |
| With (married) partner | 38 |
| With parents | 12 |
| Shared lodging / other | 7 |
| **Education (N=55)** | |
| Primary School only | 15 |
| GCSEs | 22 |
| A Level / Higher / 6th Year Studies | 49 |
| None / Still at school | 13 |
| **Professional Training (N=58)** | |
| Apprencticeship | 38 |
| Mastership / Technical college | 2 |
| University | 31 |
| Currently training / no professional training / other | 29 |
| **Employment status (N=65)** | |
| Self-employed | 9 |
| Full-time | 23 |
| Part-time / casual | 14 |
| Unemployed | 12 |
| Retired / on incapacity benefit | 25 |
| Housewife / husband / other | 17 |

Table 2
TYPE OF FOLLOW-UP CONTACTS AND FREQUENCIES (N=171)

| Type of contact | Frequencies | % |
|---|---|---|
| Telephone | 288 | 51 |
| Letter | 145 | 25 |
| Email | 73 | 13 |
| Personal counseling | 61 | 10 |
| Housecalls | 3 | 1 |
| TOTAL | 570 | 100 |

People who feel irritated by exceptional experiences often report other psychosocial factors affecting health and well-being. Table 3 gives an overview of the reported general problems associated with exceptional experiences. 67% of the clients name at least one factor which presently has destabelizing effects on the person. Especially in single session counseling we often don't get all the information we would like. So in 40-50% of the cases we have either no or only partial information about general problems, current illnesses or other relevant stress factors which the client is experiencing. 40% of the clients explicitly say that they feel generally, stressed and burdened independently of the exceptional experiences. 23% say this is not the case and for 37% there are no data.

Table 3
GENERAL PROBLEMS OF THE CLIENTS (N=121)

| Type of reported problems | Yes | No | ? |
|---|---|---|---|
| Socially affected | 45% | 12 | 44% |
| Physically affected | 28% | 19% | 53% |
| Emotionally affected | 47% | 12% | 41% |
| Generally affected | 40% | 23% | 37% |

43% of all clients report having had psychotherapy and/or psychiatric experiences, 14% said this is definitely not the case, and again for 43% of the clients there is no data.

Based on the counselors' global clinical rating, 49% of the clients were estimated as mentally disrupted. These results correspond with the ratings of the previous years, as well as with global estimations reported, for times without systematic documentation and the results are independent of the different counselors.

Table 4

PSYCHOTHERAPY/PSYCHIATRIC EXPERIENCE AND PSYCHOLOGICAL DISRUPTION (N=121)

| | Psychologically Disrupted | Not Psychologically Disrupted | ? | Total |
|---|---|---|---|---|
| Psychotherapy and/or Psychiatric experience | 29% | 11% | 3% | 43% |
| No Psychotherapy and/or Psychiatric experience | 4% | 10% | 0% | 14% |
| Missing data | 15% | 23% | 5% | 43% |
| TOTAL | 49% | 43% | 8% | 100% |

Figure 1

FREQUENCIES OF EXCEPTIONAL EXPERIENCES (N=121, MULTIPLE CHOICE POSSIBLE)

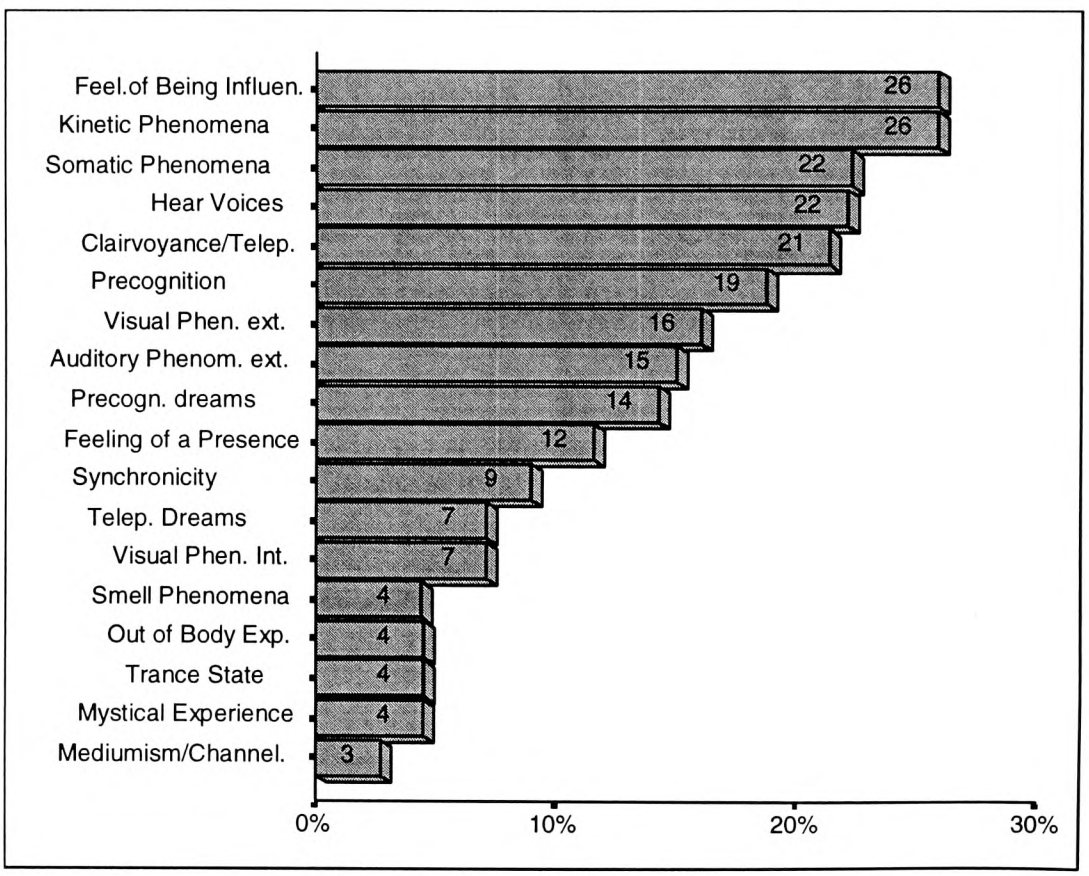

Table 4 shows the correlation between psychological disruption and psychiatric or psychotherapy experience

Figure 1 shows the frequencies of different exceptional experiences as mentioned by the clients. Every client reports an average of three different categories.

16% of the clients do not know how the exceptional experiences happened the first time. 71% report that they happened spontaneously. 7% say it was externally induced (e.g., psychic, healer). 6% report self-induced (e.g., occult practices).

The most frequently mentioned experiences were feelings of being influenced. One quarter of the clients believe themselves to be paranormally influenced by a secret power or supernatural forces. This experience is often connected with somatic phenomena and hearing voices. Compared to other exceptional experiences, it is here where we find strongest evidence for psychological disruption.

Table 5 shows all reported exceptional experiences with frequencies of more than 8% in connection with psychological disruption. 23 of the 28 clients who reported feelings of being influenced were categorized as mentally disrupted. Less affected were clients who reported precognitive dreams.

Table 5
EXCEPTIONAL EXPERIENCES AND PSYCHOLOGICAL DISRUPTION (N=121)

| Type of experience | Psychologically not Disrupted | Psychologically Disrupted | ? | N |
|---|---|---|---|---|
| Feelings of being influenced | 2 | 23 | 3 | 28 |
| Kinetic Phenomena | 10 | 12 | 2 | 24 |
| Clairvoyance/Telepathy | 10 | 10 | 2 | 22 |
| Hearing voices (internal) | 7 | 13 | 2 | 22 |
| Somatic Phenomena | 5 | 15 | 2 | 22 |
| Precognition | 8 | 9 | 0 | 17 |
| Visual Phenomena (external) | 6 | 7 | 3 | 16 |
| Precognitive dreams | 7 | 6 | 0 | 13 |
| Acustic Phenomena (external) | 7 | 6 | 0 | 13 |
| Feeling of a presence | 4 | 5 | 1 | 10 |
| Synchronicity | 3 | 6 | 0 | 9 |

## BASIC ASSUMPTIONS IN EE-COUNSELING

Right now we are at a point where we have correlative data about characteristics we find in people who report exceptional experiences and, based on that, some preliminary ideas about a possible model for the development of a paranormal belief system. As a second element, we have systematically documented data about clients who report exceptional experiences and seek help and advice because they feel irritated and affected. Third, we have descriptions about counseling with these people as well as clinical experience in this field. This knowledge can be used as a starting point for guidelines for a specific counseling approach.

The fundamental principal of our counseling work is to accept the clients and their reports about exceptional experiences for what they are: subjective reconstructions and models of explanation of the exceptional experiences and their consequences. We avoid labeling the experience as a symptom of a mental disorder.

## THE COUNSELING PROCESS

### *Building a relationship*

Working with people who claim EE and seek help and advice requires special caution and, at the same time, clarity when building a relationship with the clients.

People who come for counseling because of their exceptional experiences often have prior experiences with different medical and psychosocial institutions. Very often these experiences have been of a negative kind. The affected persons feel that they are not taken seriously, their experiences are categorized as illusion, halluzination, craziness or mental disorder. Because of this, many clients approach us with caution, fear and mistrust on the one side and high hopes of finding a competent and understanding expert this time on the other. So from the very beginning the counselors' primary goal is to establish a workable and positive relationship with the affected person.

### *Gathering information*

During the first contact we try to gain an understanding of the reported phenomena: how, when and in which context they developed and the subjective ideas, representations and theory about the exceptional experiences expressed by the clients.

At the same time, we gather data of the life history, sociodemographic data and information about (traumatic) life events. In order to filter out people with a mental disorder according to DSM IV or ICD 10, the information is screened symptom oriented. The data are categorized from our documentary system, which registers sociodemographic data, screening data about social, physical or emotional stress factors, clients and counselors assessment of mental disruption and subjective descriptions of exceptional experiences. In a weekly case conference, the enquiries of the past week are discussed and ways of proceeding are considered and determined.

### *Agreement on Counseling Goals*

The next step in counseling is to reach an agreement on the goals of counseling and the general procedure. This way misdirected expectations (arranging adresses for healers or mediums, application of paranormal techniques etc.) can be clarified and our possibilities can be presented. At this point it is important for us to transmit our work methods, which integrate clinical and parapsychological aspects. The utmost goal of the

counseling is to dedramatize and demythologize the events and to support a process of assimilation and integration of the experiences into the self-concept.

In counseling we differentiate between global and specific goals. Global goals function as guidelines for every counseling process and also as outcome and quality measures regarding our work. Specific goals are individually determined.

*Setting variables for EE-Counseling*

The counseling programme is based on the integration of clinical psychological and parapsychological knowledge. It ranges from single informational and educational sessions to long-time psychotherapy.

The kind of setting we choose for counseling depends on several internal and external variables. These parameters are e.g. the extent of the client's report about his feelings of being affected by EE, his motivation in looking at the EE in connection with his life situation and history vs. the request for mere information. Additional parameters are: organisational aspects such as the distance between our advice center and the clients' place of residence, his/her motivation to invest time and money to come for counseling or just to call us or write letters and e-mails. This means that often a classical counseling or therapy setting cannot be realized. Thus, since we often help and give advice to people who live far away, a great deal of our inquiries come in by telephone or mail. However, sometimes people prefer to visit our advice centre in person even if they have to come from far away. Especially in these cases we make appointments that last for several hours. In these cases the counselors take short breaks to discuss their hypotheses and further actions. These single session interventions aim at giving the clients concrete suggestions and advice as to how to handle the problem and the EE.

If people come for personal counseling they often bring along their partners or other family members, friends or witnesses of their exceptional experiences. Here it is also of help to be able to work in a setting with two counselors. This is realized by having two counselors work as a team, one of whom has a specialized training in parapsychology, the other one in clinical psychology and psychotherapy. This way we try to avoid an early fixing on either one of the perspectives. Instead we try to obtain synergetic effects of the two views in the counseling process.

*Counseling strategies:*

In the following section I will explain the strategies we follow in order to reach the above mentioned goals:

*Dedramatizing and demythologizing the experience:*
People seeking advice in the context of EE are usually stressed and show some kind of an adjustment problem independent of the EE. As we have seen from analyzing our data, our clients are often affected by earlier life-events which were sometimes traumatic and/or actual distress. Experiencing an exceptional event is usually seen as another stressful life-event.

So what we have to do first is to explain to our clients that their experiences are not completely new and unusual. We inform them about the epidemiological spread of exceptional events and that we have heard about quite a few similar experiences in our work. If we consider it fruitful we add results from parapsychological research outside of the laboratory. We also tell them that the fact that it happened to them now doesen't mean that it will happen for the rest of their life. In some cases we can also offer natural, physical or physiological and neurobiological explanations which can normalize the event tremendously (e.g. consequences of meditation, yoga, drugs, parasomnias). At any rate, the occurrence of the reported event is not questioned, as we start from the assumption that psi exists as a narrative for a truly exceptional experience rather than a phenomenon.

At this point we have to be extremely careful not to produce any false memory syndrome, not only with respect to traumatic life events but also to exceptional experiences. This might be generated if we show more interest in the phenomena than in the person and his request.

*Enhance flexibility of the cognitive connections:*
Many of our clients come with a relatively fixed idea or even a rather elaborate subjective theory about their EE. We tell them that their explanation is just one way to understand the experience and that there might be others that work just as well or even better. We also encourage clients to experiment with alternative explanations for the exceptional experiences and even to try out completely absurd ideas as possible explanatory models. This aims at disconnecting stereotypic images, ideas and emotions and enables a more flexible structure of memory and identity.

This is being done using elements from cognitive therapy in order to disconnect dysfunctional cognitve structures and prepare the person to organize memory and identity anew. We assume that a dissociative process has led to a change in memory and identity, so that two or more mental processes or contents are not associated with each other.

This requires good counseling skills because at this point we have to balance a validation of the client with his exceptional experience and the reality testing and verbal challenging of the paranormal explanation.

*Help to integrate the EE in the concept of the self and the world*
One of our basic goals is to find a narrative of the experience that fits into the individual's concept of himself and the world. Depending on the amount of time we have for the counseling (single-session or long term), we take a more or less detailed personal history of the phenomena and corresponding important life events. This enables us, together with the client, to rebuild a record of autobiographical memory that is continuous within his self and world-view and that is connected to important life events.

*Regaining self-controll and perspective*
Many of our clients feel influenced by external forces or other persons. Here it is important not to try to convince the client that this is not the case but instead to help him regain self-control or psychological immunization. Keeping records or a diary of the exceptional experiences helps people to detect a system in the reported experiences, if they are connected to certain places, situations, physical sensations, emotions or cognitions. In poltergeist cases the phenomena usually disappear as soon as people try to write it down and get a hold of it.

## PROBLEMS AND LIMITATIONS IN COUNSELING PEOPLE WHO CLAIM EE

As we have seen from the documentation of our work there are certain *common characteristics in the counseling structure:*

- Counseling by telephone, letter and e-mail are the dominant media
- Single session counseling (45%) and short time interventions (max. 5 contacts) are predominant
- Limited time, especially for people who live far away form our counseling centre
- High stress levels caused by irriations due to the EE or being affected by life events demands acute relief and solution oriented intervention
- Clients expect paranormal not psychological questions and solutions

The existence of these requirements has consequences for the basics, as well as for the limitations, of counseling and the possibilities of diagnostics and evaluation. So the actual concept of EE-counseling follows certain *guidelines*:

- Counseling must be orientated at strategies of single session and short-time-therapy
- A counseling model has to be developed that consists of global strategies, as well as specific strategies, according to the different media used (personal, letter, telephone)
- The counseling concept must be independent of psychological disorders
- The counseling model has to integrate educational parts with information about exceptional experiences and stress inoculation
- The counselors' attitude is active, solution-oriented and structured
- Quick and competent screening for clients who are suicidal, psychotic or heavily traumatized is essential. They need long term therapy!

Considering these guidelines, we know that we need highly qualified counselors to work with people who claim EE. The *job description* can be summarized in the following way:

- High complexity of setting, request and field of work (i.e. people seeking advice use different media for contact, have heterogenous requests and topics and ask for all kinds of services)
- High expectations on behalf of the client (because of frequent and numerous negative experiences with other health professionals and institutions)
- Diffusion in role expectations (counselors are researchers and psychotherapists at the same time)
- Pressure of time (because of high costs in telephone counseling or travelling expenses for clients; concentration problems if clients are very stressed; means of communication are limited on the telephone)

So what kind of knowledge, background and education is necessary for succesful counseling with people who claim EE? With the following list, we make *recommendations* and know at the same time that we formulate a high standard:

- Theoretical knowledge about the phenomena (physical, psychological and cultural/ethnological)
- Knowledge in clinical psychology
- Competence in counseling and psychotherapy
- Self-exploration and self-awareness regarding EE, suicide and mental disorder
- Knowledge of the regular and alternative health care system
- Supervision of counsellors

In dealing with exceptional experiences, the challenge is the same for counsellors as for clients. We need a lot of personal and material ressources to keep on developing our concepts. I sincerely hope that further research in the field of dissociation, memory, and identity will be a link between clinical psychology and parapsychology and help bring the topic back into our textbooks.

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# ANOMALOUS BASELINE EFFECTS IN MAINSTREAM EMOTION RESEARCH USING PSYCHOPHYSIOLOGICAL VARIABLES[1]

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## ABSTRACT

The goal of this study was to see whether anomalies observed in physiological baseline measurements could be found in data from previously published studies. Three datasets were reanalyzed. The first dataset was from a study on the speed with which fear arises in animal phobic participants vs. controls. The second study was concerned with the difference in anticipatory responses prior to choosing cards from risky vs. non-risky decks of cards in a gambling task. The third dataset was from a study investigating the effect of emotional priming on the evaluation of Japanese characters.

In all three studies marginally significant anomalous effects were found. The anomaly was an unexpected difference in the baselines preceding randomized emotional vs. calm stimuli. In the studies using emotional pictures this was mostly due to the baselines preceding erotic pictures. The combined result across the three studies was significant ($z = 2.748$, $p = 0.003$).

A secondary goal of this study was to estimate, independent of the reason for the anomalous baseline effect, how much this effect might have influenced measurement of the response values. It is shown that the error introduced by taking a baseline value at or just before the start of the stimulus ranges from 10% to 30% of the main effect, at least in the three studies investigated here. This finding carries implications for the interpretation of results in mainstream psychophysiological research.

## 1. INTRODUCTION

In psychophysiological research on emotions, subjects are typically presented with emotional or calm stimuli while psychophysiological measures are continuously monitored. The dependent variable in studies of this kind is generally the post-stimulus response to the aforementioned stimuli. In this article we will restrict ourselves to skin-conductance measures as the dependent variable of interest. The response value of this variable can be operationalized in many ways. One could use the peak value obtained in a specified time period following the stimulus, or the integral over the signal during this period, etc. (Boucsein, 1992). In the majority of studies a baseline value, usually derived from the signal just before presentation of the stimulus, is subtracted. The reason for this baseline correction is to reduce variance in the signal that is not related to the stimulus *per se*, but to previous exposures or to habituation to the target sequence.

In a study where subjects were presented with a randomized sequence of emotional and calm visual stimuli, Radin (1997) found suggestive evidence that the baseline values appeared to be related to the subsequent stimuli. Most notably the baseline level of skin conductance preceding highly emotional stimuli was higher than the baseline level preceding calm stimuli. This anomaly appeared to be experimentally

[1] I wish to express my gratitude to A. Hamm and M. Durieux for providing me with the raw data of their experiments. A.Bechara was helpful in pointing out that the randomization used in their study was not appropriate for drawing strong conclusions about the true anomalous nature of the effects. Last, I thank my daughter Jet Bierman for the conscientious way in which she obtained the data from the gambling study.

robust, but also rather surprising, because if the effect was real it would imply that a commonly used procedure for calculating response values in psychophysiological studies was biased in an unknown way.

To determine whether these anomalous baseline effects might have been caused by a problem with the instrumentation, we decided to replicate the original study with entirely different hardware and software. The results were basically similar, albeit slightly smaller in magnitude, in three independent experiments (Bierman & Radin, in press). Given the possible relevance for mainstream emotion research, we reported these findings as a note in *Perceptual and Motor Skills,* concluding that the reported effects might indicate that commonly employed double-blind, randomized protocols still allowed subjects to (unconsciously) infer the category of the forthcoming stimulus (Bierman & Radin, 1997).

The questions asked in the current investigation were: 1) Are these apparently anomalous baseline effects also present in paradigms that are not specifically designed to measure them, and 2) if so, how serious an error would this constitute in the calculation of the response values or other normal variables of interest?

To answer these questions we reanalyzed data from three previously published psychophysiological experiments by researchers who were unaware of this anomaly, and with completely different research goals in mind. The advantage of using these independent datasets is that they can shed light directly on the prevalence and magnitude of the effect in generally accepted research paradigms where randomization procedures are used to prevent the subject from out-guessing the category of the upcoming stimuli. The disadvantage is that the experiments were not intended to exclude all normal explanations of a possible anomalous baseline effect, including inappropriate randomization. As a consequence, we cannot draw generalized conclusions about the reality of the anomaly, but we can identify whether these anomalous baseline differences appear in "unsuspected" data. Thus, if the effect is found, it may stimulate other researchers to investigate this issue, and in the process either find a normal explanation or establish a true anomaly.

## 2. GLOBAL DESCRIPTION OF DATASETS USED IN THE REANALYSIS.

Three datasets from three different paradigms in psychophysiological emotion research were selected for reanalysis. The necessary data was retrieved for each of these three experiments, all of which used strong emotional stimuli and skin conductance as the dependent measure.

The first dataset was obtained by request from Prof. Alfons Hamm (of the University of Greifswald, Germany). The data were skin conductance samples from an experiment exploring the speed with which fear arises in animal-phobic subjects after a picture with the fear-inducing animal is shown. The data for the control group were also made available. The experiment was reported by members of Hamm's research group (Globisch et al, 1999). The setup and especially the timing of the stimuli were close to the experimental setup used in the original studies suggesting the anomalous baseline effect (Radin, 1997; Bierman & Radin, 1997). We refer to this study as the "animal-fear study."

The second dataset was obtained from graphs published by Prof. Antonio Damasio's group from the University of Iowa Medical School, in *Cognition* and *Cerebral Cortex* (Bechara et al, 1994, 1996). These data concerned the skin conductance of brain-damaged and normal subjects while they participated in a gambling task. Specifically, skin conductance was measured just before subjects took a winning or losing card from one of four randomized decks of cards. These decks were designed to be more or less advantageous in the long run. The goal of the study was to investigate if subjects' physiology reflected learned, unconscious knowledge about the decks before the subjects were consciously aware that the decks

were biased. This study differed considerably from the studies originally suggesting the anomalous baseline differences. Most notably, the emotional event was not induced by a well timed pictorial stimulus but by a less well-controlled feedback of the sum of money that was won or lost. We refer to this experiment as the "gambling study."

The third dataset was obtained from a master thesis experiment at the University of Amsterdam investigating the effect of emotional primes on the evaluation of Japanese characters (Durieux, 1999). During this experiment, which was essentially a replication of a study by Murphy and Zajonc (1993), skin conductance was measured because certain theoretical frameworks (e.g., LeDoux, 1996) suggested that the conscious evaluation of the Japanese character is driven by non-conscious processes which might be reflected in the subject's physiology. The experimenter provided the raw dataset directly to the present author. We refer to this study as the "emotional priming" study.

For all three studies the global hypothesis was that the baseline (anticipatory skin conductance) preceding emotional events would be greater than baselines preceding non- or less-emotional events. For details of the studies that are not relevant for the understanding and evaluation of our reanalysis, refer to the original publications.

## 3. THE ANIMAL FEAR STUDY [2]

### *3.1 Participants*

Eighty six participants (54 women; 32 men; ages 18-41) were selected from a student population. Subjects were included in the high animal fear group if they scored above the 85$^{th}$ percentile of the distribution in their gender group on either a spider or a snake fear questionnaire. Volunteers were assigned to the control group if their scores fell below the 50$^{th}$ percentile on either of these questionnaires.

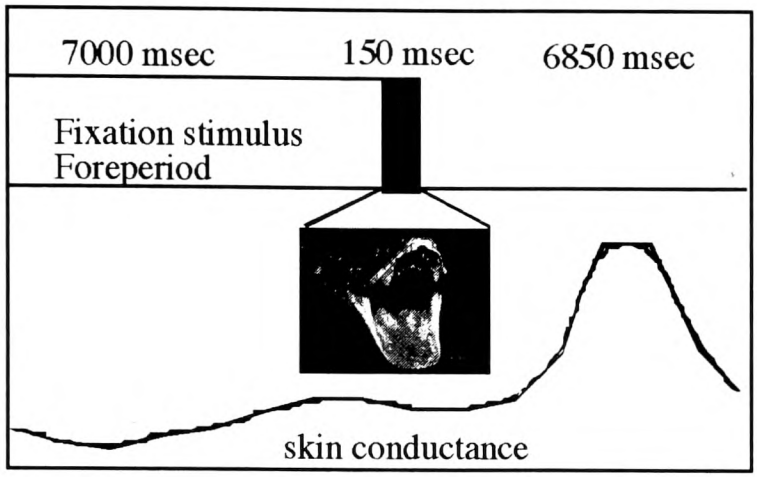
### *3.2 Procedure & materials*

Each participant viewed 60 color slides, in part selected from the International Affective Picture system (IAPS, Center for Study of Emotion and Attention, 1995). From these 60 slides, twenty were snakes or spiders, depending on the scores on the animal fear questionnaires, 8 were erotic pictures, and 32 were calm pictures like mushrooms, household, animals or flowers. For 38 subjects (14 animal fearful) the pictures were presented for 150 msec preceded by a fore-period of 7 seconds during which a fixation point was shown (see Figure 1).

For the remaining 48 subjects the presentation time of the stimulus was 6 seconds, but in order to keep the total measuring time similar, the fore-period was reduced to 2 seconds. The data of these subjects could not be used for the analysis of the baseline effects because the fore-period was too short to investigate differences. (However, we will consider these data when explaining the importance of having a longer fore-period when establishing true baselines in the results section.) Skin conductance was sampled with a sampling rate of 10 Hz and a resolution of 0.001 microSiemens.

[2] The description of this experiment closely follows the description in the original publication.

Figure 1:
TIMING OF STIMULI IN ANIMAL FEAR STUDY




*3.3 Data reduction*

To prevent potential bias from selective analysis of a specific period before stimulus onset, we deliberately defined the "baseline conductance" as the average of the conductance over the *whole* fore-period of 7 seconds. Thus all 70 samples before stimulus onset were reduced to a single value (by averaging) as opposed to using a optimal period based upon visual inspection of the graphs. For each subject, we compared these average values for the erotic pictures with the values for the calm pictures, and then calculated a z-score using the random permutation method (Blair & Kaminski, 1993)[3]. This was also done for the difference between the baseline preceding the snake/spider stimuli and the calm stimuli.

*3.4 Data analysis*

The hypothesis was tested by comparing the *z*-scores obtained from each subject with the expected mean z-score of 0 using a simple one-sample *t*-test.

*3.5 Results*

Figure 2 shows skin-conductance as a function of sample number in a superposed epoch analysis graph for all subjects combined.

As can be seen from Fig. 2 it appears as though skin conductance preceding the erotic pictures was larger than skin conductance preceding the snake/spider pictures as well as the level preceding the calm pictures. The skin conductance data were clamped at "-7" seconds (7 seconds before stimulus onset or sample number 1).

[3] The RPA method, also known as bootstrap analysis, makes no assumptions about the distribution or the interdependence of the data because it uses the empirical distribution derived from the actual data of each subject. Two procedures may be used to calculate a z-score using this RPA method. In the first method, the empirical mean and standard deviation obtained by repeated simulation of the experiment are used. In the second method, the *z*-score is calculated from the *p*-value that arises through counting the number of times the same or a higher score arises in the simulations. We used the latter method because the former method assumes normality. The two methods applied to our data yield *z*-scores that correlate with a correlation coefficient of ~ 0.99 and thus will produce over-all results which are almost identical.

*3.5.1 erotic versus calm baselines*

Out of the 38 subjects, 3 did not show any response at all. They were removed from the statistical analysis. Table 1 shows the calm vs. erotic results. To illustrate the possible impact of person-variables on the anomalous baseline differences, the results are split for male and female.

*3.5.2 Animals (spider/snake) versus calm baselines*

Table 2 gives the calm versus spider/snake results split for male and female.

*3.5.3 Clamping at -2 seconds*

To illustrate the relevance of taking a baseline value at the right moment, and moreover that it is quite difficult to assess anomalous baseline differences if the sampling starts immediately before stimulus onset, we examined the data from subjects that got 6 second exposures in the Animal Fear study (fig 2a). For these subjects the sampling started 2 seconds before stimulus-onset. We present this plot together with the plot given in Figure 2, but now starting and clamped at 2 seconds before stimulus onset (fig 2b). Although

Figure 2

AVERAGE SKIN CONDUCTANCE FOR THE THREE TYPE OF STIMULI.

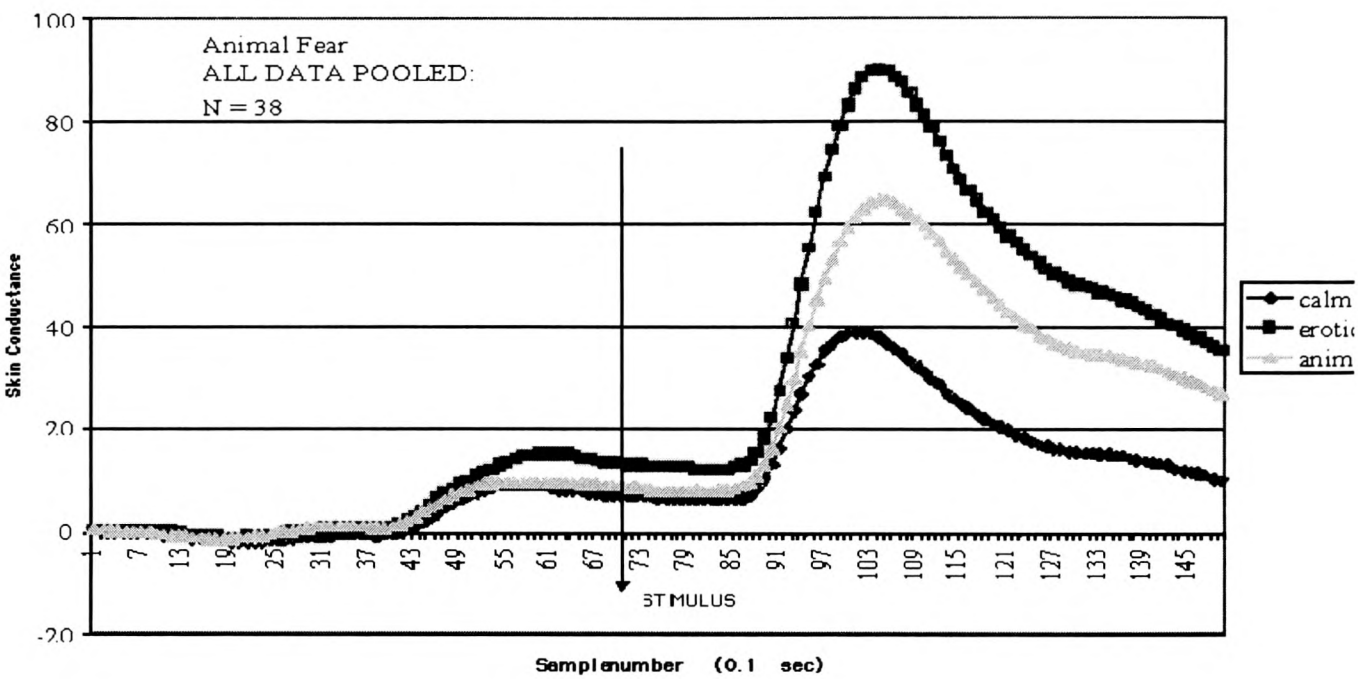


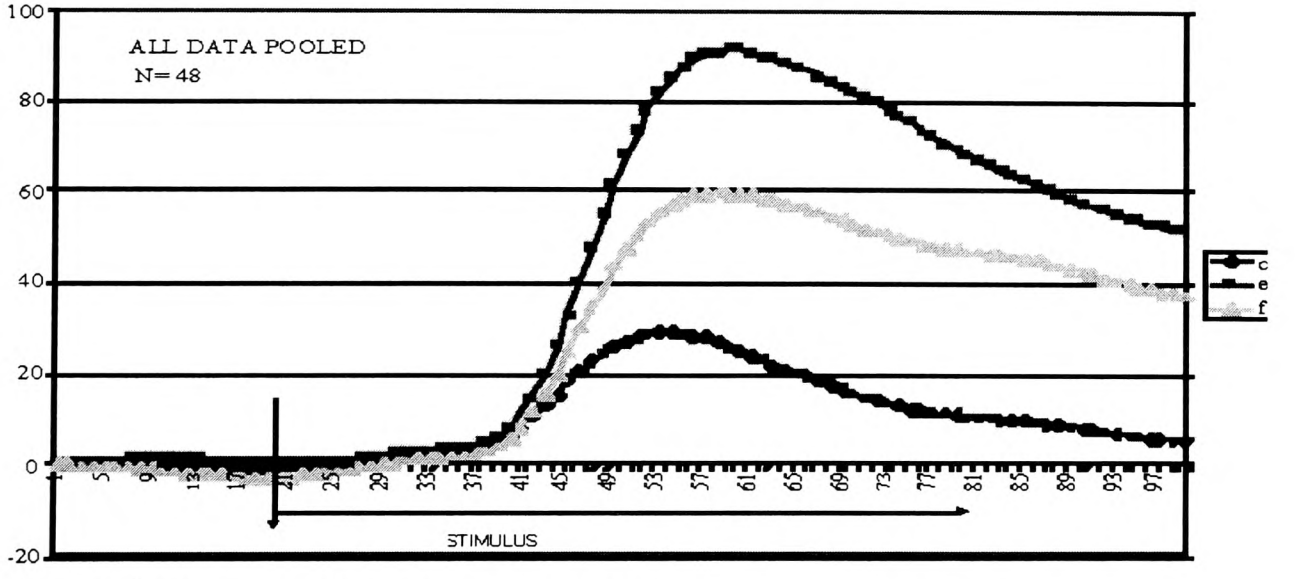
Table 1

| | Mean *z*-score | df | *t* | *p*[4] |
|---|---|---|---|---|
| Female | 0.320 | 21 | 1.903 | 0.0354 |
| Male | 0.062 | 12 | 0.215 | 0.4168 |
| TOTAL | 0.225 | 34 | 1.497 | 0.0718 |

Table 2

| | Mean z-score | df | t | p |
|---|---|---|---|---|
| Female | -0.020 | 21 | -0.135 | 0.553 |
| Male | 0.188 | 12 | 0.779 | 0.226 |
| TOTAL | 0.058 | 34 | 0.455 | 0.326 |

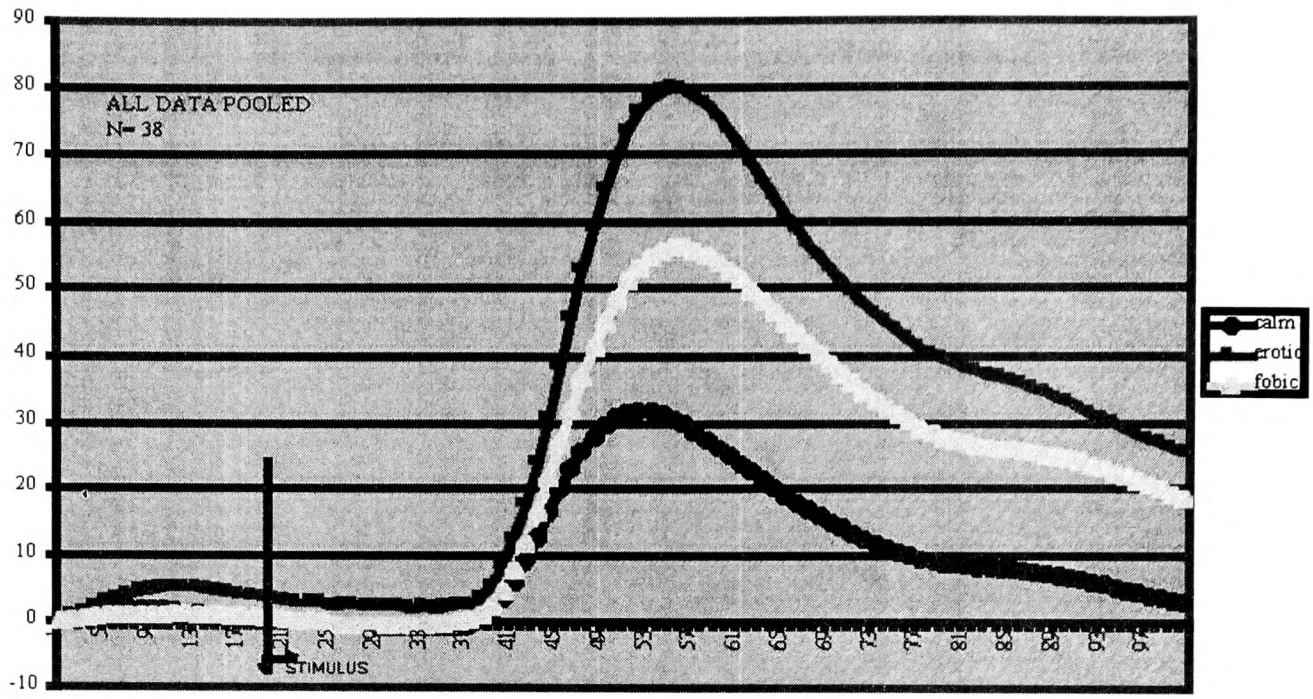
Figure 2a




top line=erotic, middle line=fobic, bottom line=calm

[4] All *p*-values are one-tailed because a direction of the expected effect was specified.

Figure 2b




a slightly larger baseline difference is seen in the 150 msec exposure graph, both graphs look quite similar during the 2 seconds before the stimulus, and it is only because we were fortunate that sampling started much earlier before stimulus onset in the 150 msec exposure that the anomalous baseline differences could be detected.

## 4. THE GAMBLING STUDY

### *4.1 Participants*

Seven of the participants (4 male, 3 female) were patients with a normal IQ but with bilateral damage to the ventromedial prefrontal cortices. Twelve (5 male and 7 female) were normal control subjects.

### *4.2 Procedure*[5]

In a gambling task simulating real-life decision-making in the way it factors uncertainty, rewards, and penalties, the players (participants) are given four decks of cards, a loan of $2,000 facsimile U.S. bills, and asked to play so that they would lose the least amount of money and win the most. Turning each card carries an immediate reward ($100 in decks A and B and $50 in decks C and D). Unpredictably, however, the turning of some cards also carries a penalty (which is large in decks A and B and small in decks C and D). Playing mostly from the disadvantageous decks (A and B) would lead to an overall loss. Playing from the advantageous decks (C and D) would lead to an overall gain. The players have no way of predicting when a penalty would arise in a given deck, no way to calculate with precision the net gain or loss from

[5] The description given here is a verbatim copy of the description given by the original authors (Bechara et al, 1997).

each deck, and no knowledge of how many cards they would have to turn to end the game (the game was stopped after 100 card selections). After encountering a few losses, normal participants begin to generate skin conductance responses before selecting a card from the bad decks, and they also begin to avoid the decks with large losses. Patients with stable focal lesions as described above do neither.

*4.3 Data extraction and analysis*

The data we are interested in are identical to the data used in Bechara's (1997) analyses. This data led to the conclusion that normal participants began to generate anticipatory responses prior to taking a card from one of the disadvantageous decks. From our perspective this anticipatory response is the "baseline" for the response that will follow upon feedback of the actual amount that the participant wins or loses. Rather than evaluating these data as a function of the riskiness of the deck, as was the original goal of the study, we are interested in these baselines as a function of the forthcoming winning or losing card. The baseline effect found by Bechara et al can be explained in a normal causal way under the assumption of implicit learning of the riskiness of the decks. However if different baselines are found preceding good or bad cards this would be another example of an anomalous baseline effect. As Bechara et al state explicitly, *"the players have no way of predicting when a penalty will arise..."* (Bechara et al, 1997).

The relevant data of the 12 healthy subjects were extracted (using a graphics pointing device which gives the precise values of the coordinates) from Figure 4 in an article in *Cerebral Cortex* (Bechara et al, 1996), which describes their results. Although this figure gives the values only as a function of sequential order of the card within the deck, we could reconstruct the win/loss amount for each of these cards by using Figure 1 from the article in *Cognition* (Bechara et al, 1994). The data extraction was done by a person blind to the hypothesis. Since the original analyses used parametric tests, we employed a simple t-test to evaluate our hypothesis that baseline levels preceding the losing cards would be higher than those preceding the winning cards.

*4.4 Results*

Only the data for the normal subjects were used because the brain damaged patients typically did not develop anticipatory responses. Table 3 gives the results of the t-test comparing the baseline skin conductance before winning and before losing cards. The results are also given for each individual deck.

Table 3

DIFFERENCES BETWEEN BASELINE PRECEDING WINNING AND LOSING CARDS

| Deck | Mean Diff | df | t | P-value |
|---|---|---|---|---|
| Deck A | 0.176 | 20 | 1.214 | 0.1195 |
| Deck B | -0.017 | 25 | -0.102 | 0.5400 |
| Deck C | 0.016 | 33 | 0.256 | 0.3996 |
| Deck D | 0.028 | 33 | 0.571 | 0.2860 |
| All Decks | 0.085 | 117 | 1.634 | 0.0525 |

In 3 of the 4 decks the differences are in the expected direction and the decks pooled give a marginally significant difference in the expected direction.

## 5. THE EMOTIONAL PRIMING STUDY

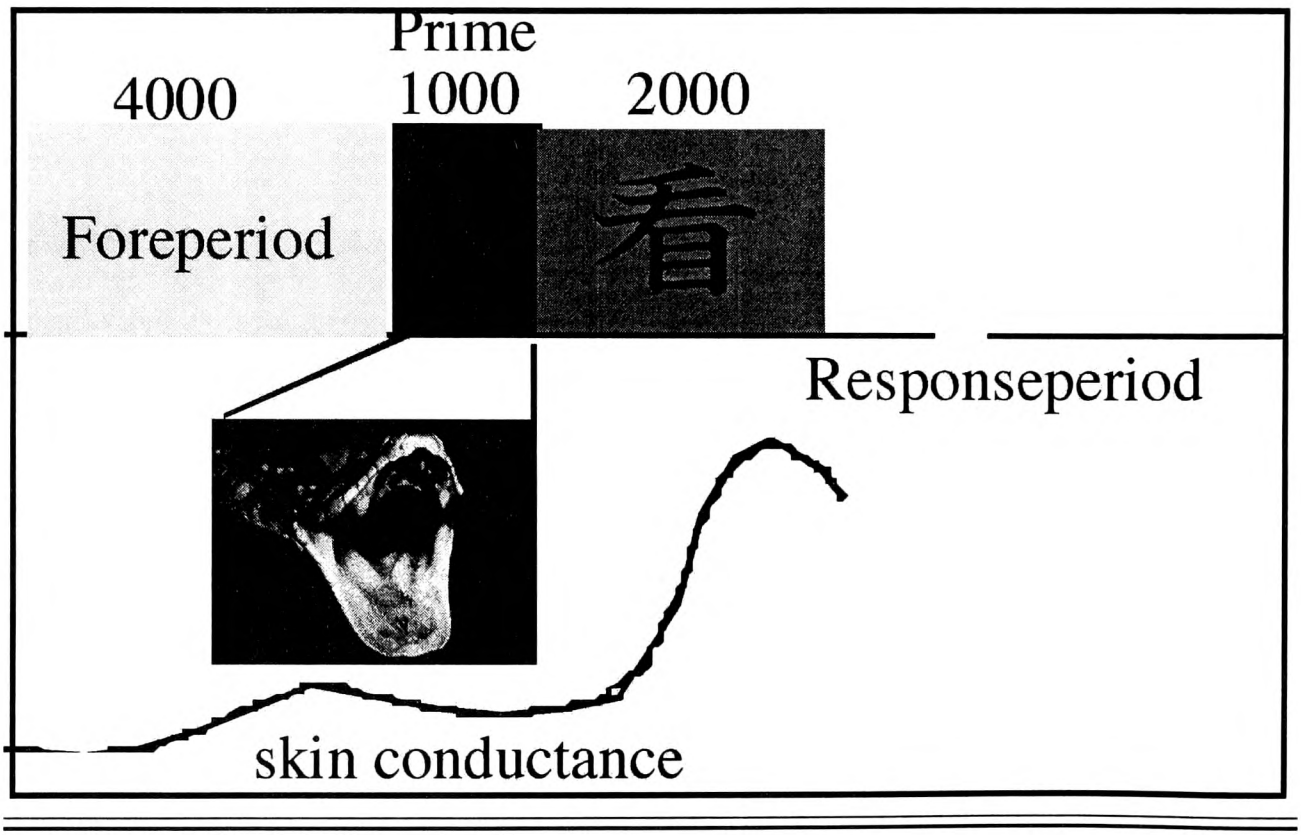
### *5.1 Participants*

Thirty-two freshman psychology students, 19 female and 13 male, participated in this study.

### *5.2 Procedure*

Each trial consisted of three distinct phases. First, there was a blank screen for 4000 msec, followed by a randomly selected prime which lasted 1000 msec[6]. This was followed immediately by a random Japanese character which lasted for 2000 msec after which the subject had to give an evaluation of this character on a 4 point Likert scale (see Figure 3). Skin conductance was sampled with a sampling frequency of 10 Hz and a resolution of 0.005 microSiemens.

Figure 3.
TIMING OF STIMULI IN 'EMOTIONAL PRIMING' STUDY




[6] It should be noted that in half of the trials there was a masked prime with an exposure time of 15 msec. We did not use these data because this prime was not consciously perceived and thus this condition was basically different from the circumstances under which the anomalous baseline effects were originally found.

*5.3 Categories of stimulus material*

This study had 5 stimulus categories, not all of which are relevant for the present reanalysis. We removed 2 stimulus categories involving positive and negative faces. These are often used in this type of research, but the emotional content of these is quite moderate compared to the erotic and the fear-inducing stimuli. The three remaining categories more closely match the three categories used in the Animal Fear study, namely, 'erotic', 'threatening animals', and 'neutral' stimuli. The emotional stimuli were each used 6 times and there were 12 neutral stimuli per subject. The presentation order was newly randomized for each subject.

*5.4. Data reduction*

As in the analysis of the 'Animal Fear study', we used the average of all data preceding the prime as the baseline value. This value was then used to calculate two z-scores per subject in the same way as described before. One z-score represented the mean difference in baseline before the erotic and neutral primes, and the other represented the mean difference in baseline before the threatening animals, primes, and neutral primes.

*5.5. Data analysis*

A t-test was used to test our main hypothesis that the baselines preceding the emotional primes would be larger than those preceding the neutral primes.

*5.6. Results*

All data for the 32 subjects and the relevant stimulus categories are shown in Figure 4. The graphic difference between the mean skin conductance records belonging to erotic and neutral primes is quite impressive, but of course they must be tested statistically. It is interesting to note that in this case, as in the Animal Fear study, there is little difference between the records from the fear-inducing primes and the neutral primes. Unlike the Animal Fear study, this also holds for the response part of the records. It should be noted, however, that in the present study no selection of participants was made based on specific animal fear phobias.

*5.6.1. Erotic versus Calm baselines*

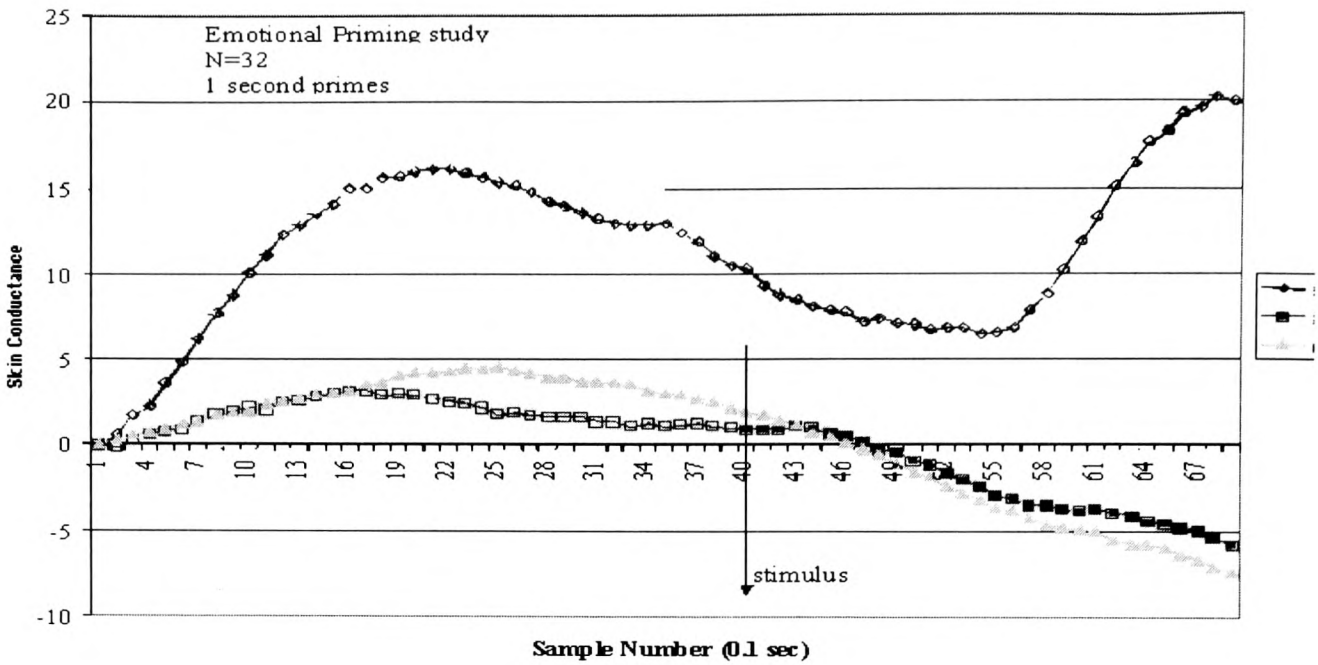
Table 4 shows the result of the t-test when comparing the mean baseline values for erotic stimuli with those for the neutral stimuli.

Table 4

RESULTS FOR COMPARISON OF BASELINES PRECEDING EROTIC AND CALM PICTURES.

| Stimuli | Mean diff | df | t | p |
|---|---|---|---|---|
| Erotic - Calm | 0.307 | 31 | 1.844 | 0.0374 |

Figure 4:
AVERAGE SKIN CONDUCTANCE FOR THE THREE TYPE OF STIMULI.




top line=erotic, lowest line at end=neutral, middle line at end=animal

*5.6.2. Evolutionary relevant vs calm baselines*

Table 5
RESULTS FOR COMPARISON BASELINES PRECEDING 'ANIMAL FEAR INDUCING' AND CALM PICTURES.

| Stimuli | Mean diff | df | t | p |
|---|---|---|---|---|
| Animal – Calm | 0.131 | 31 | 0.691 | 0.2472 |

## 6. CONCLUSIONS

*6.1 Is there an anomalous baseline effect in the data?*

In order to answer whether there is an anomalous differential effect that is detectable *prior* to the stimulus presentation, we pooled the results of the three studies using all trials, erotic, animal fear, and calm data. Table VI summarizes all data from the individual experiments, and gives the composite result across the three experiments, calculated by the standard Stouffer Z procedure (Rosenthal, 1978).

Table 6
OVERVIEW OF 'ANOMALOUS' BASELINE EFFECTS IN THREE STUDIES

| Study | *t* (ALL emotional – calm) | df | *p* | Corresponding *z* |
|---|---|---|---|---|
| Animal-fear study | 1.44 | 69 | 0.0773 | 1.423 |
| Gambling study | 1.634 | 117 | 0.0525 | 1.620 |
| Emotional Priming | 1.73 | 63 | 0.0431 | 1.716 |
| OVER-ALL | | | | 2.748 |

Although only one of the studies reached the traditional 5% level for significance, together they certainly seem to support the earlier findings that skin conductance baselines preceding emotional events are higher than those preceding calm events.

The question if this constitutes a genuine anomalous effect in the sense that it cannot be explained within standard scientific models, can be answered only in specifically designed research. All three of these experiments used a randomization method without replacement. This allows for the possibility that subjects might have implicitly learned the ratio between emotional and calm events over the course of the experiment and then they applied this knowledge later in the experiment. Computer simulations modeling this behavior reveal that in the case of randomization without replacement that anticipatory effects as large as a few percent of the main effect can be obtained artifactually (Bierman & Radin, in press).

An argument against this explanation is that such behavior is not observed in practice, especially not the perfectly systematic behavior required to produce slight statistical artifacts. Also, the 'anomalous' effects reported here are much larger than any effect that was obtained in the aforementioned simulations of the effect of randomization without replacement. One further argument could be found in the apparent consistent difference between the baselines preceding emotional stimuli of a different nature, like erotic and animal fear inducing stimuli.

Since it is not the primary goal of this reanalysis to demonstrate the existence of an anomaly, we will not further evaluate this question. Nevertheless, we may conclude that baseline differences prior to a stimulus do occur under generally accepted randomization procedures in psychophysiology. Thus the calculation of response values using such baselines might be in error.

*6.2 Assessment of impact of baseline effect on response values*[7]

In most psychophysiological research on emotions the variable of interest is the difference in response values after exposure to either emotional or control stimuli. If the response value is calculated as the difference in conductance value at stimulus on-set and the maximum value after some latency time, then the underlying assumption is that the baselines at stimulus onset are not correlated with the emotionality of the

[7] It should be noted that the normal anticipatory increase in skin conductance that occurs in paradigms where the subject knows when the stimulus is coming is assumed to be additive to the response when calculating response values by subtracting the baseline at stimulus onset. From the graphs in figure 2 and certainly from the graph in figure 4 we can see that this assumption is suspect. There is a strong indication that the anticipatory contribution declines at stimulus onset and that the contribution to the peak value might be very small. Thus, even without anomalous baseline differences, the assessment of true response values might be contaminated by general anticipation, which influences skin conductance levels at stimulus onset.

upcoming stimulus. As we have shown in the preceding paragraph, this assumption may not be warranted. How serious is this anomalous baseline problem?

In table 7 we have calculated the differences in baseline preceding calm and emotional stimuli at stimulus-onset versus the differences in the peak values after the latency times for the Animal Fear study and the Emotional Priming study. For the Gambling study we have calculated the differences in anticipatory values before taking winning and losing cards versus the differences preceding taking cards from 'good' or 'bad' decks.

Table 7

COMPARISON OF 'ANOMALOUS' BASELINE DIFFERENCES AND NORMAL EFFECTS

| Study | Baseline difference | 'Peak value' difference | Baselinediff./ 'Peakvalue' diff. |
|---|---|---|---|
| Animal Fear (erotic-calm) | 5.87 | 51.02 | 11.5% |
| Gambling (losing-winning) | 0.085 | 0.287 | 29.6% |
| Emotional priming (erotic-calm) | 8.33 | 25.53 | 32.6% |

For the Animal Fear study and the Emotional Priming study this would imply that the response effects of emotionality are *underestimated* by 11.5% and 32.6% respectively if the baselines are assessed at stimulus onset.

The impact of the difference between winning and losing cards on the main effect of interest in the gambling study is more difficult to evaluate. This is because the variable of interest is the anticipatory skin conductance (or what elsewhere would be called the baseline) itself. Here we have an anomalous effect embedded in the "normal" effect. The 29.6% is therefore not an estimate of the error in the calculation of the effect of selecting "good" versus "bad decks. Detailed examination shows that the 'anomalous' contribution was not evenly distributed over the decks as can be seen in table 8.

Table 8

ANOMALOUS WINNING-LOSING CARD EFFECT SPLIT FOR GOOD AND BAD DECKS.

| Type of Deck | Mean difference lose-win | df | t-value | p-value |
|---|---|---|---|---|
| Good | 0.043 | 68 | 1.246 | 0.108 |
| Bad | 0.160 | 47 | 1.675 | 0.050 |
| TOTAL | 0.085 | 117 | 1.634 | 0.052 |

Most of this effect is concentrated in the bad decks (0.16 vs 0.043 for the good decks). Thus the difference between the contribution of the anomalous component is about 0.11, which certainly suggests that the anomalous effect has contributed to some degree to the overall effect.

In conclusion, the analyses provided in this article suggest that whatever the true nature of these apparently anomalous effects, they seem to play a non-trivial role in present day psychophysiological research on emotions.

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# PERIODICITIES IN ARCHIVED CARD-GUESSING DATA: PRELIMINARY REPORT ON A LARGE DATABASE[1]

Richard S. Broughton & S. James P. Spottiswoode


## ABSTRACT

Previous investigations by Spottiswoode have shown a) that anomalous cognition or ESP is greatly enhanced during a narrow window of local sidereal time (LST), an astronomical measure which indicates which slice of heavens is overhead at that time and b) an expected negative correlation between ESP and geomagnetic fluctuation (the *ap* index) is significantly strengthened during that same window of LST time. Less dramatic effects in the data indicate possible additional periodicities, such as a reduction of scoring during other LST periods. These findings suggest that there may be physical moderators of ESP performance of unknown, but possibly celestial or solar/geomagnetic origin. These findings were based on a database of nearly 3,000 trials of free-response data from remote viewing and ganzfeld experiments.

To follow up on these findings the authors drew upon the archives of the Duke University Parapsychology Laboratory to compile a database of good quality, relatively standard ESP experiments that exhibited strong overall evidence of ESP. Sixteen datasets from recognized card-guessing experiments of 1930s contributed a total of 7,167 runs, mostly from two laboratories. The combined *z*-score for these data is 18.79.

Effect sizes were calculated and plotted in LST space using a sliding two-hour window as in the previous investigations. Similarly, Spearman's ρ was calculated in a two-hour sliding window and plotted in LST space. The effect size (ESP scoring) data revealed two periods of significantly enhanced scoring and two periods of depressed scoring that were similar, but not exactly the same as those found in the free-response data. The correlation with *ap* was $\rho = .036$ ($p(2t) = .002$). This positive correlation is contrary to the expected weak negative correlation found in other ESP data, however the plot in LST space revealed that the correlation turns negative opposite the main peaks of ESP scoring, similar to what Spottiswoode had observed earlier. These findings do not confirm Spottiswoode's specific finding of a high-scoring window centered on LST 13.5±1h but they do suggest the presence of an LST-related influence on ESP performance that needs further elucidation.

Several additional analyses made possible by the large database explored more common periodicities as the month, day of the week, and hour of the day in which the tests were conducted. May and September stood out as the best months for ESP testing while January and February were the poorest. Monday held a strong advantage among the weekdays and early afternoon seems the best time of day for testing. These suggestive findings make sense in terms of human performance.

Further investigations are continuing and caution is noted regarding the need to disentangle the time of day and time of year effects from LST effects to avoid artifacts.


## INTRODUCTION

As part of a continuing search for physical modulators of ESP (anomalous cognition in his terminology) (Spottiswoode, 1997a) examined an existing database of 1,468 free response trials from a variety of laboratories in relation to a component of the celestial coordinate system used to locate objects in the heavens. Local sidereal time (LST) is a longitudinal-like astronomical coordinate that points to a specific portion or slice of the celestial sphere that is directly overhead. For a given hour of LST, the same slice of the heavens is over the observer wherever he or she is located. Since the sidereal day is approximately 3′56″ shorter than the solar day, a given hour of LST slowly moves across all hours of the solar day. The studies Spottiswoode had accumulated were conducted under the remote viewing or the ganzfeld protocols. His initial examination revealed that trials within one hour either side of 13.5 LST showed a gain in effect

[1] This work was supported in part by a grant from John Björkhem Memorial Foundation.

size of 340% over the mean. A confirmatory data set of 1,015 trials was obtained from various investigators (who were blind to the initial findings) and these data showed an increase in effect size of 450% in the 13.5±1h window. Plotted against the 24 hours of the sidereal day, each data set exhibited a strikingly similar overall pattern suggesting that there may also be "bad" times for ESP as well as a second "good" time of lesser magnitude. Combining the two data sets gave an effect-size increase of 380% for trials conducted within a window of ±1 hour of 13.5 LST. Although Spottiswoode could offer no explanation for the effect, he did examine a number of potential artifacts and determined that they did not explain what he had found.

In a second investigation Spottiswoode (1997b) examined a question that has intrigued parapsychologists for some time, the relationship between geomagnetic fluctuations and ESP performance. Sparked by the work of Persinger (Persinger & Krippner, 1989; Persinger & Schaut, 1988), numerous investigators have reported results indicating that there may be a weak negative correlation between global geomagnetic activity and ESP, both in spontaneous cases and in laboratory research. Other investigators have failed to find this correlation. If valid, the negative correlation suggests that ESP is better when the earth's geomagnetic field is relatively quiet. Using the now substantial database of 2,879 free response trials from 51 studies, Spottiswoode calculated the correlation between the three-hour *ap* index of geomagnetic activity and the trial effect size in a two-hour sliding window across LST. From an overall correlation of $\rho = -.029$ ($N = 2{,}879$, $p = .06$), the correlation within the two-hour window centered at approximately 13h LST jumped to $\rho = -.33$ ($N = 134$, $p = .0001$). Plotted along the sidereal day, the negative correlation with geomagnetism displays practically a mirror image of the effect size plot from Spottiswoode's first investigation (See Figure 1.).

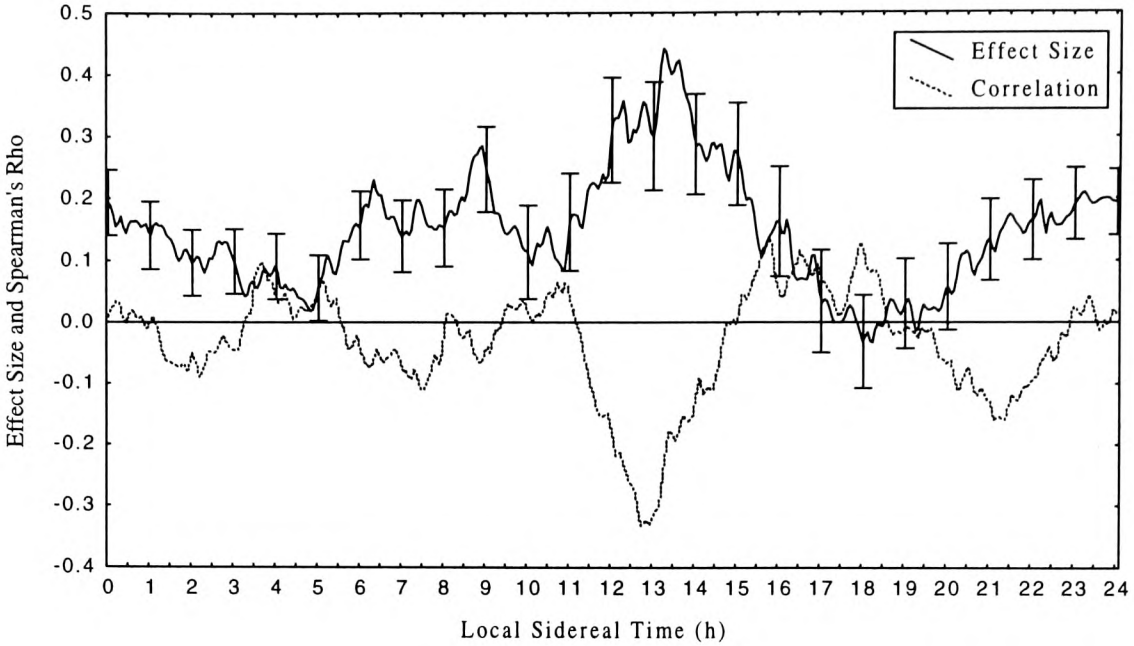
Although several additional sets of free-response data have generally conformed to the observed pattern (e.g., Alexander & Broughton, 1999) there have been no formal replications of these findings. This is at least in part due to need for a large data base since, unless deliberate efforts to schedule trials according to LST are made, only a small percentage of trials fall into the LST windows of interest.

In an innovative attempt to confirm the LST and geomagnetic findings, Westerlund and Dalkvist (1999) examined a very large database of traffic accidents in Sweden. Reasoning that if ESP is a useful human ability, one would expect it to be used to avoid traffic accidents, and if ESP is better or worse during certain LST periods, then one might expect traffic accidents to vary according to LST. Their analyses did not reveal any clear-cut effects of LST or geomagnetic fluctuation on traffic accidents, and the authors noted that it was premature to relate their findings to Spottiswoode's findings since the data sets were so different.

Spottiswoode had initially selected free-response data for his investigations because of all current ESP data, these display the most robust effect sizes. Other current experimental methods such as forced-choice guessing or RNG experiments yield relatively weak effect sizes. This was not always true, however. When Rhine's card-guessing experiments were newly introduced researchers frequently obtained stunningly high effect sizes under reasonably well-controlled conditions. A perusal of the experiments listed in Appendix 17, Table 29 in *Extra-sensory Perception after Sixty Years,* (Pratt, Rhine, Smith, Stuart, & Greenwood, 1940) reveals that card guessing experiments, in their day, produced z-scores quite unheard of today.

It should be noted at the outset that there are important methodological differences between free-response and forced-choice testing methods that are at least potentially relevant to these investigations. In free-response testing, the subject is given an instruction set heavily weighted toward acquiring visual imagery and, of course, the process *for each response* is extended in time, ranging from about 10 or 15 minutes for

Figure 1
EFFECT SIZE FROM 2,483 FREE RESPONSE TRIALS (2-HOUR MOVING AVERAGE) PLOTTED AGAINST LST AND CORRELATION WITH GEOMAGNETIC ACTIVITY (*AP*) FROM 2,879 TRIALS. FROM SPOTTISWOODE (1997B).




some remote viewing to 30 or more minutes for ganzfeld experiments. The ganzfeld free-response experiments have the added feature of sensory isolation. In forced-choice experiments the general instruction set was that of guessing, and the process was generally a "rapid-fire" response mode in which each response took only a matter of seconds. Twenty-five such rapid responses are combined into the standard unit of analysis, the run, for forced-choice experiments. Since it is conceivable that the LST or the geomagnetic findings reflect the effect of an environmental variable upon ongoing mental activity, both the different time scales and the different instructions sets could be moderating variables.

The Special Collections Library of Duke University holds the data collections of the Duke University Parapsychology Laboratory. This collection includes the raw data files from many of the card-guessing experiments conducted by Duke researchers and their colleagues at other institutions. A preliminary review of the selected containers indicated that certain experimental series could be identified and many record sheets contained both the date and time of the trial that would be needed for LST calculations. Based upon this assessment we decided to investigate a selection of card-guessing data from the 1930's for possible LST and geomagnetic effects.

## PROCEDURE

*The Data*

Based on Matlock's catalog of the Parapsychology Laboratory holdings (Parapsychology Laboratory, ND) Broughton identified a number of boxes that were likely to contain data of interest. From these boxes selected folders of original data records were reviewed for suitability. The key elements for suitability were that the records were interpretable (some non-standard recording formats were not), that they came from recognized researchers or employed recognized subjects, and that they had a date and time recorded. (Many record sheets had only the date.) Within these criteria, our goal was to collect as much data as time and resources would allow.

A Duke University work-study student transcribed the data from the original records to Excel spreadsheets on a laptop computer.[2] Before starting any data set, Broughton would review the material with the transcriber to be sure that she understood how the originals were to be transcribed. In general, all data sheets in a set were transcribed unless they lacked dates or times. Since the transcriber and authors were effectively blind to the variables of interest at this point (LST and geomagnetic variation) there was no issue of data selection. Some data sets had minor internal manipulations (e.g., with or without music), but these conditions were ignored for our purposes.

All data were from standard 25-trial runs of ESP card guessing. The run score was the basic data point, in addition to the date and time and several pieces of identification. Date and time information were typically recorded once on a data sheet indicating the time the testing began, which meant that a number of runs would (usually up to 10) would be associated with the same date and time marker. Judging from some record sheets that gave a time range and from intervals between successive record sheets, 10 runs were completed in about 30 minutes.

Table 1 lists the datasets and their principal characteristics. The summary statistics are based upon the actual usable data points culled from each collection.

After data entry was completed, Broughton spot-checked all data sets for accuracy. During the course of the analyses, Broughton double-checked several apparent inconsistencies in times or dates. Only a relatively few instances of incorrect times were found, attributable to misinterpretations of original records, not carelessness. No errors were found in the scores.

Four different locations are represented in the data. The largest number, set 9, came from Boulder, Colorado. Set 15 came from Grand Rapids, Michigan. Set 7 and parts of set 10 came from Asheville, North Carolina. All the rest were from the Duke University Campus. Longitude and time zones were added to the records. Shanks (1990) was consulted to determine the usage of daylight (Summer) time, but it was found that daylight time was not in use for any of the locations during the years concerned.

[2] The authors are extremely grateful to Ms. Ami Kent who spent countless hours in the library at this task.

Table 1
DATA SETS USED IN THE ANALYSIS

| Set | Description | Runs | Hits | Mean | Z-Score |
|---|---|---|---|---|---|
| 1 | Pearce-Pratt 1933 | 75 | 561 | 7,48 | 10,74 |
| 2 | Eileen Garrett 1935 | 557 | 2713 | 4,87 | -1,53 |
| 3 | Gibson testing Hess et al.1936-37 | 50 | 247 | 4,94 | -0.21 |
| 4 | Rhine testing Woodruff 1936 | 235 | 1226 | 5.22 | 1.66 |
| 5 | Gibson testing Lottie H. 1937 | 373 | 1892 | 5.07 | 0.70 |
| 6 | Additional Pearce 1933 | 20 | 96 | 4,80 | -0.45 |
| 7 | Rhine/ Owenby testing Zirkle 1933 | 14 | 78 | 5.57 | 1.07 |
| 8 | Rhine, Zirkle-Zirkle testing various 1935-36 | 99 | 471 | 4.76 | -1.21 |
| 9 | Martin and Stribic, U. Colorado 1937-39 | 3650 | 20868 | 5.72 | 21.67 |
| 10 | Zirkle testing Zirkle 1935-36 | 304 | 1720 | 5.66 | 5.74 |
| 11 | Zirkle testing Cooper 1934 | 162 | 900 | 5.56 | 3.54 |
| 12 | V. Sharpe testing E. Sharpe 1937 | 243 | 1260 | 5.19 | 1.44 |
| 13 | Hutchinson testing various 1937 | 120 | 614 | 5.12 | 0.64 |
| 14 | Additional Gibson testing Hess 1936-37 | 179 | 861 | 4.81 | -1.27 |
| 15 | Gibson testing various 1935 | 41 | 222 | 5.41 | 1.33 |
| 16 | Blanchard/ Bradshaw testing various 1937 | 1045 | 5288 | 5.06 | 0.97 |
| TOTAL | | 7167 | 39017 | 5.44 | 18.79 |

Local sidereal time (LST) was calculated for each trial and added to the data set. Geomagnetic *ap* indices were obtained from the National Geophysical Data Center, Boulder, CO (`ftp://ftp.ngdc.noaa.gov/STP/GEOMAGNETIC_DATA/INDICES/KP_AP/`) and the associated *ap* index values were added to the trial records.

## RESULTS

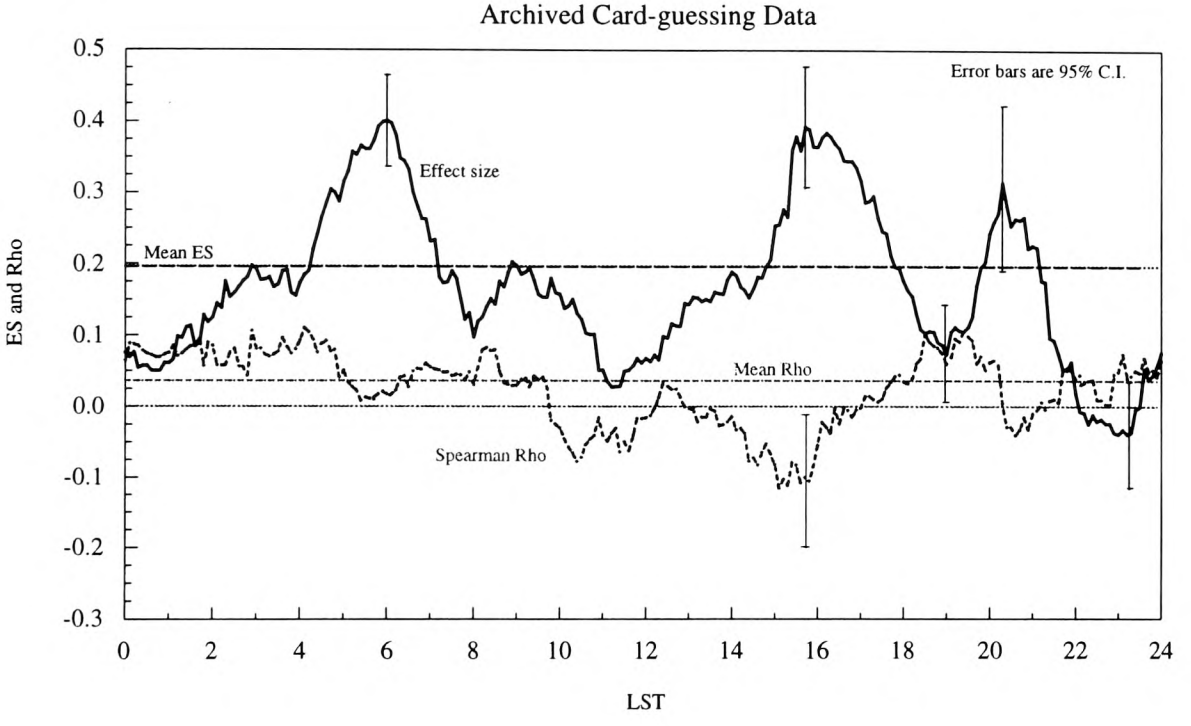
An effect size (continuity-corrected *z*-score) was calculated for each run. The mean ES for the entire dataset was 0.196 (95%CI: 0.174, 0.218). The dataset was padded with two copies of itself where time values were 24h later and 24h earlier than the actual time. The data were boxcar smoothed within a 2-hour wide window incremented in 0.1h steps. This is the same technique used in previous analyses (Spottiswoode, 1997a). The solid upper line in Figure 2 is the smoothed average effect size and the error bars represent the 95% confidence interval. The effect size plot reveals a pronounced patterning to the data,

with peaks at about 6h and 16h that are significantly different from the mean ES. Troughs that are significantly below the mean ES are at about 11h, 19h, and 23h.

Spearman's ρ was calculated between the *ap* index for the 3-hour period associated with the time of the run. Spearman's ρ was used rather than Pearson's r to allow for the statistical properties of the *ap* index (Spottiswoode, 1993). The overall correlation was $\rho = .036$, ($N = 7{,}167$, 95%CI: 0.013, 0.059, $p\{2t\} = .002$). Following Spottiswoode (1990), the distribution of the correlation function in LST space was examined by calculating ρ between the effect size and *ap* in a 2-hour sliding window of LST, incremented by 0.1h for LST values 0h to 24h. Padded data were used as with the effect size. The lower dashed line in Figure 2 is the smoothed values of ρ in LST space.

Figure 2

EFECT SIZE (SOLID LINE) AND SPEARMAN'S ρ PLOTTED IN LST SPACE. DATA ARE 7,167 RUNS OF ARCHIVED CARD-GUESSING TRIALS.




## DISCUSSION

The most obvious finding in these data is that the forced-choice data do not confirm Spottiswoode's 13.5H "window" found in the free-response database. The present results yield a classic "good news—bad news" situation. The good news is that there is a striking pattern in the data that again suggests that there is an undetermined physical influence on ESP scoring that varies with LST. The bad news is that the effects do not provide a simple confirmation of Spottiswoode's earlier findings. Yet, even within the bad news there are some encouraging points of similarity. In Spottiswoode's original free-response data set (see Figure 1,

page 6 in Spottiswoode, 1997a) there was also a noticeable increase in scoring around 6h LST, though this was overshadowed by the 13.5h peak. Similarly, the troughs at about 11h and 19h LST seem common to both the free-response and card-guessing data. The second peak and its following trough in card-guessing data looks similar to the same region in the free-response data, only displaced by about 2.5 hours.

Observations such as the foregoing are intended only to guide future investigations and theorizing, where both the differences and similarities in the two datasets may prove instructive. Obviously the datasets represent two different approaches to ESP testing, which may be relevant to the findings. Although it was the second to be examined, the card-guessing dataset is more than twice as large as the free-response dataset, so it is not immediately apparent which set should confirm which. The datasets are also separated by about 50 years, so there may be some cosmological or environmental differences that could account for the different patterns. It should also be noted that LST is a linear combination of time of day and day of year. Therefore non-uniform distributions of effect size across these two variables may give rise to artifacts in any relationship between effect size and LST.

The overall correlation between effect size and geomagnetic fluctuations was the opposite of what was expected based on free-response data. A very small (but significant) positive correlation was found instead of a weak negative correlation. Although there is no striking evidence of patterning in the correlation in LST space, there appears to be a hint of the mirroring effect that Spottiswoode found in his data, especially for the second peak in the data where there is marked strengthening of the negative correlation.

## Additional Analyses

With such a large database available we decided to explore several additional analyses that, to the best of our knowledge, have never been done before in experimental ESP data. These analyses were simply to see whether scoring in these ESP varies according to the time of the year, the day of the week, and the time of day.[3] Such situational variables might reasonably be expected to affect ESP ability, but probably would require a large database to extract such effects. These analyses were strictly exploratory.

Using standard spreadsheet functions, all trials were coded for the month, the day of the week, and the hour of the day in which they were recorded. Using the run scores as the unit of analysis, the data were grouped into the appropriate categories for the analyses and plotted with 95% confidence intervals. Figures 3, 4, and 5 present the results of the month, day of week and time of day analyses.

### *Discussion of additional analyses*

The results of these analyses present a commonsense picture of how subjects might be expected respond in a wide variety of human performance situations, including ESP tests. The monthly data reveals that the best months for ESP testing are May and September, which is not surprising given that most of the tests were done on college campuses. Clearly the winter months are not to be favored for ESP testing, with scoring in January being significantly poorer than most other months.

The weekday data may seem slightly surprising in that Monday has a significant advantage over all other days of the week. One should keep in mind that the currently fashionable aversion to Mondays may be a byproduct of the late twentieth century workplace environment in America. Earlier in the century Monday might have been seen as the day one returns from a relaxing weekend refreshed and ready to

[3] Spottiswoode (1997a p. 118ff) examined time of day as a possible artifact for the LST results, but not as a subject performance effect. Westerlund and Dalkvist (1999) examined these variables in automobile accident data.

Figure 3

CARD-GUESSING DATA GROUPED BY THE MONTH IN WHICH TESTS WERE GIVEN

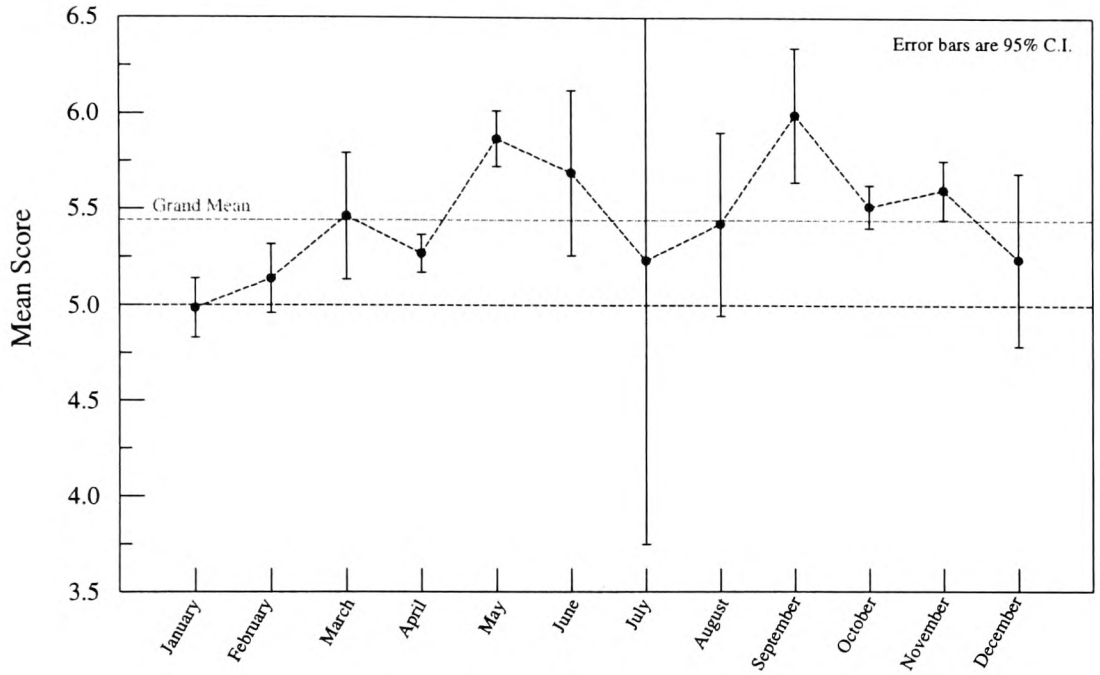



Figure 4

CARD-GUESSING DATA GROUPED BY THE DAY OF THE WEEK IN WHICH THE TEST WAS GIVEN

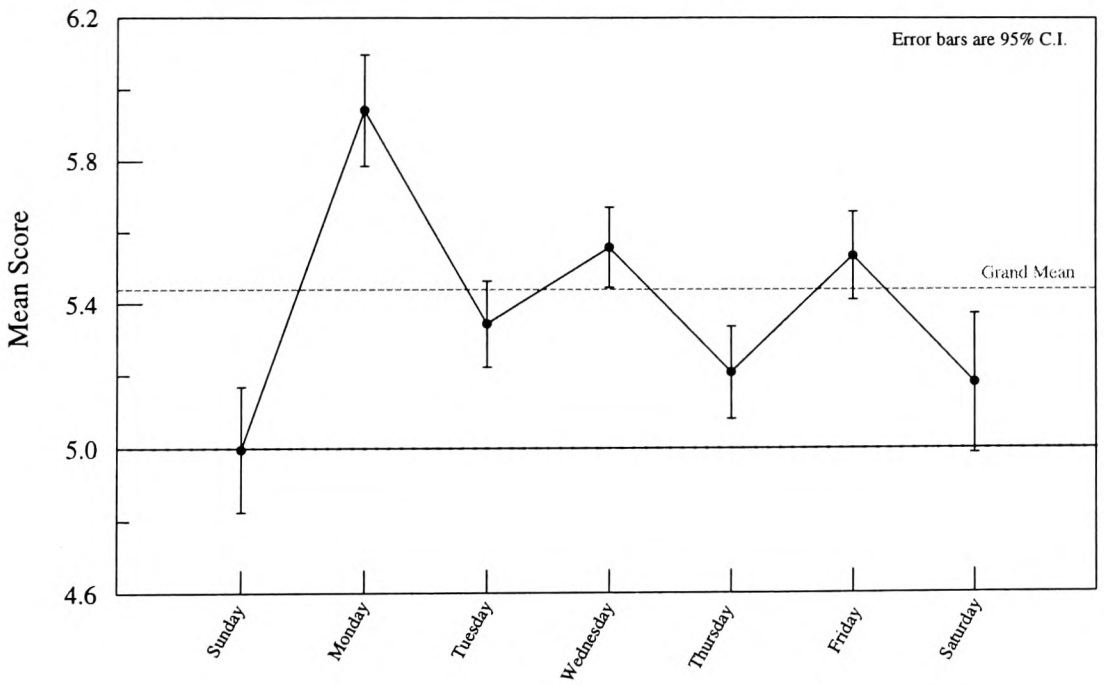
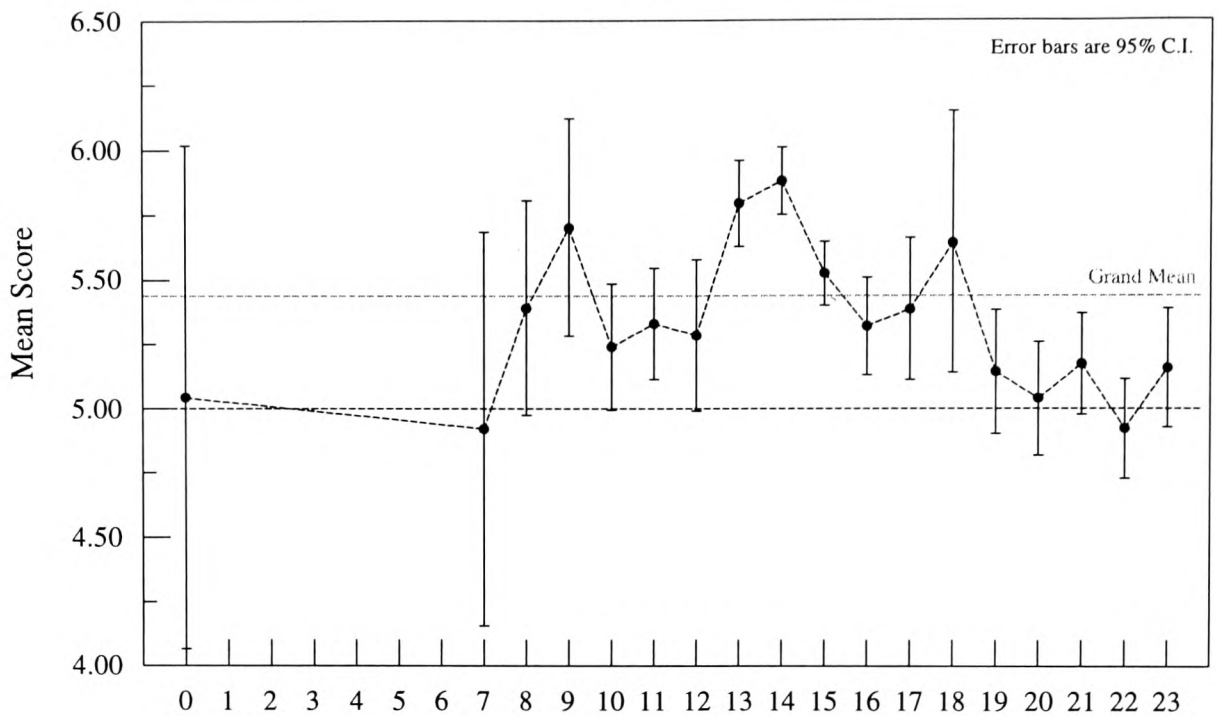


Figure 5
CARD-GUESSING DATA GROUPED BY HOUR OF DAY FOR THE TEST




face new challenges. By the same token, it seems that subjects of the time did not like to have their Sundays disturbed with the work of ESP testing.

The hourly data reveal that testing just after lunchtime is best for ESP results, with 2 p.m. having a significant advantage over most other hours of the day. Testing just after breakfast (9 a.m.) and just after dinner (6 p.m.) also shows a slight advantage. It is not surprising that the relaxed aftermath of a meal should be a good time for ESP testing, but other factors could be involved as well. Evening and late-night testing seem to be disadvantageous. This could be due to the expected effects of being tired, but it could also reflect a possible difference between formal and informal testing. It is likely that selected subjects generally would have been tested during the workday, whereas more informal testing with unselected subjects might have taken place during off hours.

These observations of a non-uniform distribution of effect by time of day and time of year are of the type (mentioned above) that have the potential to give rise to artifacts in the apparent relation between effect size and LST. We are currently studying methods that will extract any LST effect size relationship without artifact.

## GENERAL DISCUSSION

The results of the LST and geomagnetic analyses on the archived card-guessing data do not amount to a straightforward confirmation of the details of Spottiswoode's discoveries. However, the LST analysis, at least, does provide a strong confirmation of the basic discovery that there are LST-related influences on ESP performance, the nature of which remains to be discovered. Investigations are continuing using this

database and an expanded free-response database both in combination and separately to explore relationships with a wide range of celestial and geophysical factors.

The results of the month, day and time variables cannot be said to prove that any particular time frame is better than another. They do, however, confirm that with ESP we are dealing with human performance issues and that even the mundane cycles of daily living have the potential for affecting that performance. Since there are undoubtedly psychosocial factors involved, it cannot be assumed that what was influential on experiments over 60 years ago is still relevant today. Nonetheless, there are commonsense suggestions in these results that should not be ignored by contemporary investigators. Currently we are investigating these variables in the free response database.

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# LOCAL SIDEREAL TIME, GLOBAL GEOMAGNETIC FIELD FLUCTUATIONS AND MEMORY

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## ABSTRACT

The impetus for the present study was the findings of Spottiswoode (1997a, 1997b) showing that free response Anomalous Cognition (AC) effect size appears to be associated with Local Sidereal Time (LST) and that correlations between AC effect size and Global Geomagnetic Field (GMF) fluctuations appear to vary with LST. The need for replicating these findings in light of the lack of a sufficient amount of new AC data was highlighted. Using as an example a previous study on traffic accidents as related to GMF fluctuations and LST (Westerlund & Dalkvist, 1999), it was suggested that data from non-parapsychological databases could be used to test Spottiswoode's findings.

Memory data from 2859 subjects, collected in an ongoing prospective study on memory and health in Umeå, a city in the northern part of Sweden, were examined for effects of GMF fluctuations and LST. Based on modern memory theory, three different types of memory were distinguished: episodic (personal), semantic (knowledge about the world) and implicit (unconscious) memory.

Using epoch analysis, for episodic and semantic memory, the correlation pattern between memory performance and the *ap* geomagnetic index (a measure of GMF fluctuations) was found to converge toward a negative correlation at the day of simultaneous measurement of the two variables and close to the hour of simultaneous measurement (one or two hours later). Although these results are not directly relevant for testing Spottiswoode's findings, and need to be confirmed, they do suggest that future research on GMF fluctuations as related to various types of data, ordinary psychological as well as purely parapsychological data, should be a fruitful approach within parapsychology.

The results of the analysis involving LST were less clear and less positive than those involving GMF fluctuations only. The attempt to replicate using memory data Spottiswoode's relationship between performance in AC experiments and LST failed. Except for semantic memory, overall significant effects of LST were obtained, reflecting increases in performance at 7-10h LST or so. But the relationship obtained did not resemble very closely that obtained by Spottiswoode. Most notably, our performance/LST curves were displaced backward in time by at least three hours as compared to Spottiswoode's curve. In the same vein, the attempt to replicate Spottiswoode's relationship between the correlation between GMF fluctuations and performance and LST also failed. Comparatively strong negative correlations were found around 10h LST, but the relationship deviated clearly from that obtained by Spottiswoode. Again, our curves were displaced backward in time, now by at least two hours as compared with that obtained by Spottiswoode.

Based on the present results, along with corresponding negative results from the previous traffic accident study, it was concluded that Spottiswoode's findings most likely were due to incidental correspondences between periodic events. It was pointed out that such incidental correspondences may occur when performance on a particular task is affected by an interaction of (ordinary) time of day and (ordinary) time of year.

## INTRODUCTION

Among the most intriguing recent findings in parapsychology are results suggesting a relationship between local sidereal time (LST) – an astronomical measure indicating the positions of the fixed stars – and anomalous cognition (AC) – a new term for extra sensory perception or ESP. Thus, in an initial analysis of a large database comprising AC data collected in different locations in the Northern Hemisphere,

[1] We would like to acknowledge the financial support of John Björkhem Memorial Foundation. We would also like to thank Lars-Göran Nilsson – who kindly allowed us access to the Betula database, and Karen Williams for her skillful debugging of the English language.

Spottiswoode (1997a) found a correlation between AC results and LST. Specifically, experiments conducted ±1-2 hours around 13.5h LST showed remarkably large effect sizes, whereas experiments conducted around 18h LST had a mean effect size close to zero.

In a subsequent analysis of the same database, Spottiswoode (1997b) also found a relationship between LST and the correlation between effect sizes and the activity of the earth's magnetic field (GMF), partly mirroring the relationship found for AC performance. The correlations were shown to fluctuate around zero except for experiments conducted ±1-2 hours around 12.9h LST, for which the correlations were highly negative. Thus, not only the behavioral results as such, but also the correlation between the results and GMF fluctuations seemed to be related to LST. What is particularly interesting is that this finding might explain why some previous studies attempting to find a relationship between parapsychological results and GMF fluctuations have failed (e.g., Haraldsson & Gissuarson, 1987; Nelson & Dunne, 1986), whereas others seem to have succeeded (e.g., Persinger, 1985; Persinger & Krippner, 1989; Spottiswoode, 1990). The successful studies may, thus, have been conducted during favorable LST periods and the unsuccessful studies during unfavorable ones.

There are four different types of explanations for Spottiswoode's findings:

- *Direct influence on AC*: Spottiswoode's findings are due to one or several physical parameters caused by cosmic events (and correlated with LST and GMF fluctuations, respectively) that affect the *psi* signal itself, or some biological system involved in the reception of the signal. There could, for example, be effects of a complex interaction between the earth's magnetosphere, the solar wind and cosmic radiation from the Milky Way.

- *Influence on psychological states*: Spottiswoode's findings are due to one or several physical parameters caused by cosmic events (and correlated with LST and GMF fluctuations, respectively) that affect ordinary psychological states, e.g., arousal (i.e., alertness or wakefulness). Such an influence could have given rise to Spottiswoode's findings in two different ways: (a) The psychological states involved are important for optimal use of AC abilities. (b) In AC experiments, such states affect subjects' abilities to exploit perceptual leakages and other shortcomings in poorly or less well-controlled experiments.

- *Incidental correspondences between periodic events*: Spottiswoode's findings are not due to any causal effects at all, but only to incidental correspondences between different periodic events. GMF fluctuations vary with several periodic intervals (e.g., a 27-day interval that depends on the sun's synodic rotation speed). LST varies as a function of time of day, time of year and longitude. Hence, if results from parapsychological experiments also vary periodically, spurious associations between LST or GMF fluctuations and AC may emerge.

- *Pure chance*: Spottiswoode's findings are solely due to chance, and will not be replicated in future studies.

If genuine, Spottiswoode's findings should have a great potential impact, not only by directly increasing our knowledge about parapsychological phenomena, but also for purely methodological reasons. For example, by scheduling AC experiments at optimal values of LST and at times when GMF fluctuations are expected to be low, it might be possible to increase effect sizes in parapsychological experiments. Consequently, there is an urgent need to test the validity of Spottiswoode's findings.

Unfortunately, however, there is a serious impediment to conducting such a test: the amount of AC data that can be used will be severely limited for a long time to come, for two reasons. First, the number of new experiments is small; second, a record of the exact time at which a given experiment was performed is often missing, but is necessary if results are to be related to LST and GMF fluctuations.

Fortunately, however, Spottiswoode's findings can be validated, to some extent, using data from sources other than parapsychology. If either of the Explanations I or II above is true, that is, if Spottiswoode's findings are *not* due to coincidences, relationships similar to those obtained by Spottiswoode can be expected to be found not only in parapsychological databases, but also in those containing non-parapsychological data. Thus, if a presumed parapsychological phenomenon, such as

telepathy or clairvoyance, really exists, it should manifest itself not only in parapsychological experiments, but also in many real-life situations and in other types of experiments in which people's performance on, e.g., cognitive tasks is measured. If Spottiswoode's findings are genuine (Explanation 1), the phenomenon should consequently be affected by LST or GMF variations just as in the parapsychological experiments. Similarly, relevant purely psychological factors should be affected by these same variables, irrespective of whether there are any parapsychological effects involved (Explanation I). On the other hand, if Spottiswoode's results are attributable to incidental correspondences between periodic events (Explanation III) or to pure chance (Explanation IV), they should *not* be replicable using any non-parapsychological database.

In a previous study (Westerlund & Dalkvist, 1999), a database of 567,362 traffic accidents occurring in Sweden during the period 1985-1996 was examined for effects of LST and GMF fluctuations. A 200 % increase in number of accidents involving animals (roe and moose) was observed at about 19h LST. It was also observed, however, that for the first half of the year in Sweden, 19h LST coincides with the time of sunrise, and for the second half of the year with the time of sunset. The increase in number of animal accidents at 19h LST was, therefore, suggested to be due to increased mobility on the part of the animals during sunset and sunrise. Thus, with respect to number of accidents, Spottiswoode's findings could not be replicated.

Using epoch analysis (to be described later), the correlation pattern between number of accidents and the *ap* geomagnetic index (a measure of GMF fluctuations) was, for different types of accidents, invariably found to converge with negative correlations at the hour of the accident or, most often, one or a few hours before that time. Although this time lag could be interpreted as indicating that there was a *delayed* effect of GMF fluctuations on frequency of traffic accidents, it could also be interpreted as showing that the relationship was spurious.

When relating correlations between number of accidents and *ap* index to LST, finally, the correlations appeared to vary systematically with LST. The most pronounced curve was observed for accidents involving animals, with unusually strong positive correlations around 6h-7h LST and around 17h-19h LST, and with unusually strong negative correlations around 12h-13h LST. This finding was nearly the opposite of what would be predicted from Spottiswoode's (1997b) results, but is nonetheless in agreement with them. However, a plot of the correlations in a time-of-day/day-on-year diagram did *not* show that the effect of LST was persistent during the year. Instead, particular combinations of time-of-day/day-on-year (e.g. midday during the spring), unrelated to LST, were associated with the unusually strong positive or negative correlations, thus suggesting that the relationship to LST was spurious.

To summarize, the examination of effects of LST and GMF on traffic accidents did *not* give much support for either of the above Explanations I (direct influence on AC) or II (influence on psychological states). The only finding that could not be explained by interaction effects between time-of-day and day-on-year, unrelated to LST, was the "pure" effect of GMF as shown in the epoch analysis; even so, this finding was not very convincing.

The main purpose of the study presented in this paper was to test Spottiswoode's findings using another non-parapsychological database, one concerned with the memory.

## THE DATABASE

This database has been compiled in an ongoing prospective study on memory and health, conducted in Umeå, a city of about 100,000 inhabitants in the northern part of Sweden (Nilsson et al., 1997). The study

is being led by Prof. Lars-Göran Nilsson – now at the Department of Psychology, Stockholm University – who kindly allowed us access to the database and assisted us in our analyses.

The study started in 1988 and will continue until 2003. Three thousand persons, randomly sampled from the population of Umeå, have participated in the study. Considering the fact that each subject provided a large amount of memory data, the number of subjects should be quite sufficient for demonstrating any existing effect of *ap* or LST on memory functions, as measured in the present database. The design of the study includes three waves of data collection. The first of these waves was conducted in 1988-1990, the second in 1993-1995, and the third wave started in 1998 and will continue until 2001. The present analysis uses data from the second wave, including subjects (n=2859) ranging in age from 35 to 90 yrs., with a mean age of 60.5 yrs.

The memory testing covers a wide range of memory functions, including various types of recognition, recall and unconscious memory. This allows investigation of effects of GMF fluctuations and LST not only on memory in general, but also on more specific types of memory, to see whether different effects, if any, are obtained for different types of memory. Such differential effects might, in turn, provide clues to understanding the phenomena in question. Based on modern memory theory, three different types of memory were distinguished: episodic (personal), semantic (knowledge about the world) and implicit (unconscious) memory (Tulving, 1972; Squire, 1987, 1992). In the present database, episodic memory was rather highly correlated with semantic memory (.68), but only weakly correlated with implicit memory (.15); an even weaker correlation (.07) was obtained between semantic and implicit memory.

As compared with traffic accident data, memory data have one potential advantage for the present purposes: Whereas traffic accidents are highly dependent on various known external factors, such as time of day and time of year, memory data may be expected to be much less dependent on such factors.

Each subject was tested individually, on one single occasion, the testing session lasting between 1.5 and 2 hours. For each subject, complete information about the time of testing was available in the database: year, date and time of day at which the testing session started. If the time of a given testing session in the original database had been reported in daylight savings time, it was translated into "winter time."

## GENERAL METHOD

In order to test the stability of possible findings, the data were randomly split into two equally large data sets, one referred to as "original data" and the other as "validation data." The aim of this procedure was not to test any particular hypothesis generated by analyzing the original data, but rather to test the reliability of the overall results. As suggested above, the data were also split according to type of memory into three categories: (1) episodic memory data, (2) semantic memory data and (3) implicit memory data.

For each subject, an overall performance measure was available for each of the three types of memory.

Values of the *ap* geometric index for all 3-hour intervals between Jan 1, 1993 and Dec 31, 1995 were collected from World Data Center C1 for Geomagnetism on the World Wide Web. For each single hour, the *ap* index for the 3-hour interval covering the current hour was used. Because the distribution was markedly skewed, the values were logarithmized (base e). The times for the *ap* values were displaced one hour forward in time, in order to correct for the difference between UTC and Swedish time.

For the time corresponding to the start of each testing session, LST was calculated for longitude 20 degrees 18 m East – the longitude of the city of Umeå, where, as mentioned before, all data were collected. The obtained LST values were rounded off to three integers and could thus take on the values 0-239.

## CORRELATIONS BETWEEN MEMORY PERFORMANCE AND GMF FLUCTUATIONS

*Method*

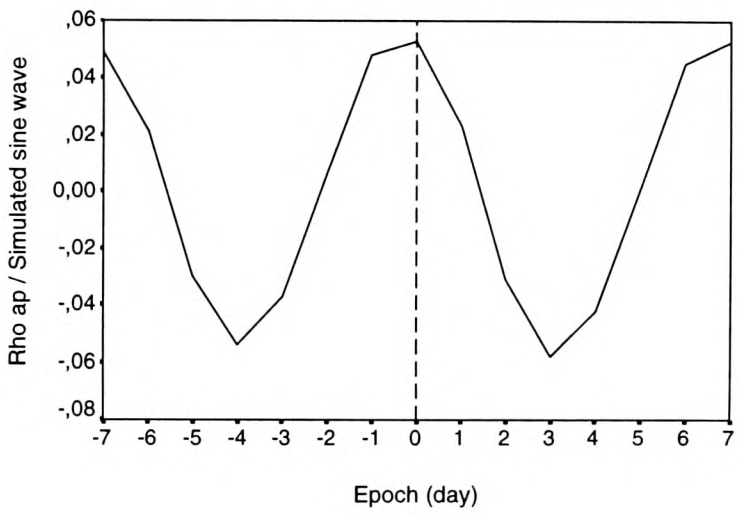
The relationship between memory performance and GMF fluctuations was first analyzed independent of LST. This was done for two different time scales: (a) one day and (b) one hour. For the day-level analyses, the mean memory performance for each day (and each memory type) was considered. The number of subjects being tested on a particular day ranged from 1 to 21. For the hour-level analyses, the mean memory performance for each hour when testing started (and each memory type) was considered. The number of subjects starting a test during a particular hour ranged from 1 to 6.

As in the traffic accident study referred to above, a method called "epoch analysis" was used (see, e.g., Braud & Dennis, 1989; Houtkooper, Schienle, Stark & Vaitl, 1988; Nelson & Dunne, 1986; Persinger & Krippner, 1989; Tart, 1988). The purpose of this method is to control for the occurrence of spurious correlations when two different time series, in this case GMF fluctuations and memory performance, are correlated. Such a spurious correlation may, for example, be obtained when both series exhibit a progressive increasing (or decreasing) trend, or one series shows a progressively decreasing trend and the other a progressively increasing trend. A spurious correlation may also be obtained when one or both of the two time series vary periodically. For example, when a progressively increasing time series happens to coincide with an increasing phase of a periodic time series, a positive correlation will be obtained, and when it coincides with a descending phase, a negative correlation will appear. When two periodic time series are correlated, either a positive or a negative correlation may be obtained, depending on how the phases are displaced relative to each other.

Using an epoch analysis, we compare the dependent variable (e.g., memory performance) with the independent variable (e.g., GMF fluctuation) not only at the time when the two variables were measured simultaneously, but also at several points in time when the independent variable was measured *before* the dependent variable, and at several points in time when the independent variable was measured *after* the

Figure 1

SPEARMAN'S *RHO* BETWEEN *AP* INDEX DATA AND A SIMULATED SINE WAVE WITH A PERIODICITY OF SEVEN DAYS.



dependent variable. If the correlations converge at the time of the simultaneous measurement, it is considered less likely that the correlation is spurious.

It is important, however, that the analysis covers a sufficiently large number of different time points (epochs). This is illustrated in Fig. 1, where Spearman's *rho* between *ap*-index data and a simulated sine wave with a periodicity of seven days has been plotted. As can be seen, although no genuine correlation exists between the two variables, the correlations converge nicely at the epoch of the simultaneous measurement (0). In the epoch analyses relating memory performance to *ap*-index data, at least 20 epochs were used, meaning that the probability of convergence at epoch 0 by chance alone was 1/20 = .05.

*Results*

*The day-level scale*

In Fig. 2, Spearman's *rho* between the three memory types and *ap* index data is shown over a period of 29 epochs on the day-level scale, 14 above epoch 0 and 14 below. As can be seen from the upper graph in Fig. 2, for the episodic memory data, the correlations do in fact converge at epoch 0 for the total data set and for the validation data set, but not for the original set. The correlation at epoch 0 was negative for all three data sets, but significant only for the total data set [$r(386) = -.114$, $p = .025$] and for the validation data set [$r(355) = -.143$, $p = .007$]. Thus, although agreement between the original and the validation data sets was not very good, on the whole, the episodic memory data would seem to indicate that episodic memory tended to deteriorate with increased geomagnetic fluctuations.

As can be seen from the middle graph in Fig. 2, plots of the semantic memory data are similar in form to those of the episodic memory data, with a tendency for the correlations of the total data set and those of the validation data set – but not those of the original data set – to converge toward a negative correlation at epoch 0. The convergence was less pronounced for the semantic memory data than it was for the episodic memory data, however, and none of the three correlations at epoch 0 was significant.

As can be seen from the bottom graph in Fig. 2, in contrast to the episodic and semantic memory data, the implicit memory data did not show any strong indication that this type of memory was affected by geomagnetic fluctuations. There is a slight tendency for the correlations to converge at epoch 0, but there are several epochs exhibiting stronger negative correlations. The two "bumps" in the graph are perhaps due to cyclic variations in the two variables; the similarity between this graph and that of the simulated sine wave (Fig. 1.) is striking.

*The hour-level scale.*

In Fig. 3, Spearman's rho between the three memory types and *ap* index data is shown for a period of 25 epochs on the hour-level scale, 12 above epoch 0 and 12 below. This means that Fig. 3 almost exactly replicates the epoch 0 parts of the curves in Fig. 2 in a magnified form.

As can be seen from the upper and middle graphs in Fig. 3, for both the episodic and the semantic memory data, the correlations converge, or tend to converge, at the same epoch: epoch 2. This was not exactly the epoch at which the correlations were expected to converge, however. Since a session, as mentioned before, lasted between 1.5 and 2 hours, and the memory tests were evenly distributed over the session, the strongest correlations should have occurred at the end of the first hour of a session, that is, at epoch 0 or epoch 1, not at epoch 2. Nevertheless, the discrepancy is not large enough to refute the possibility that geomagnetic variation actually did affect episodic and semantic memory at the hour level. What may have created this discrepancy will be discussed later.

Figure 2

SPEARMAN'S *RHO* BETWEEN THREE MEMORY TYPES AND *AP* INDEX DATA FOR DIFFERENT EPOCHS (DAYS). ORIGINAL, VALIDATION, AND TOTAL DATA SETS

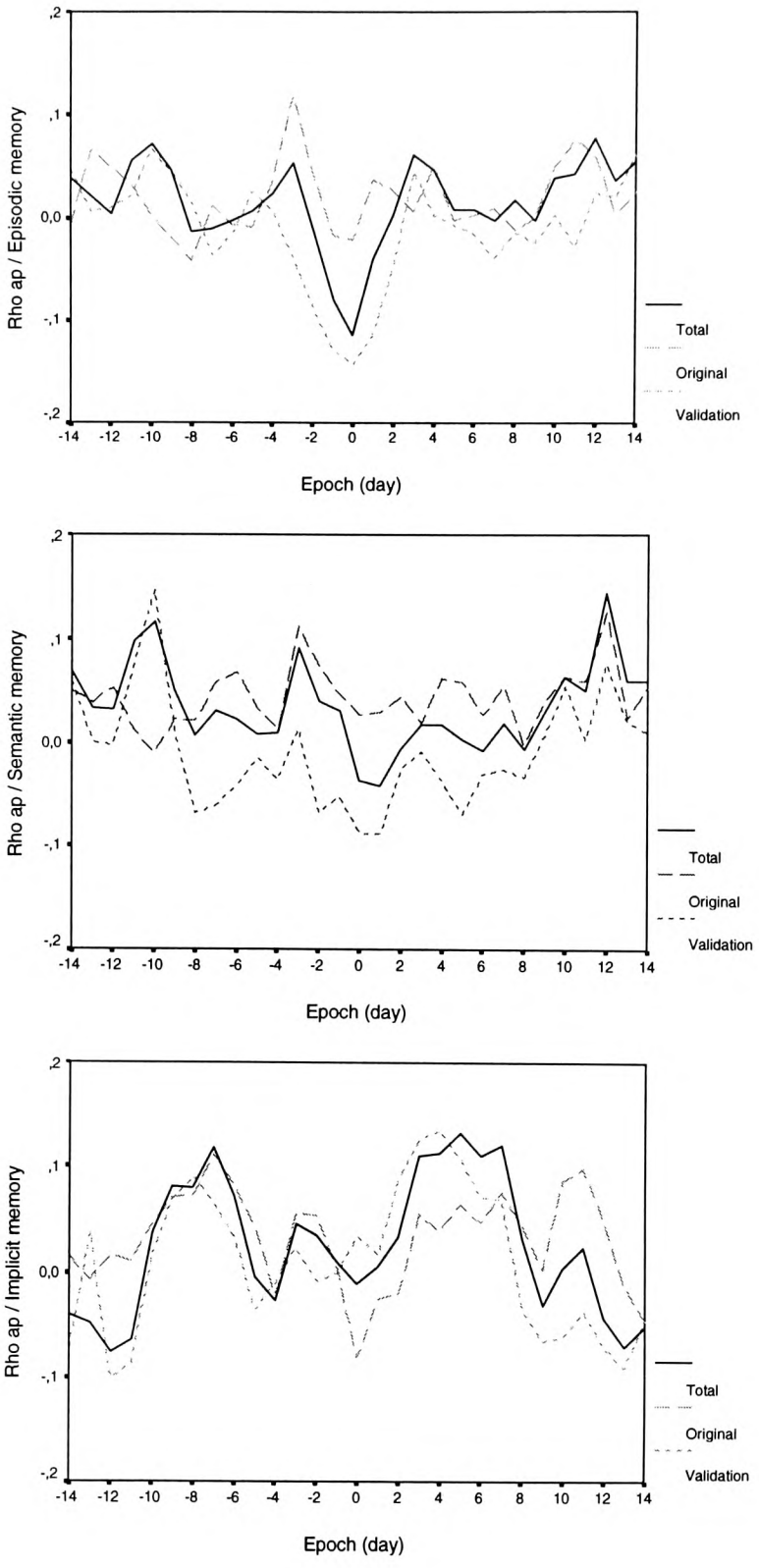
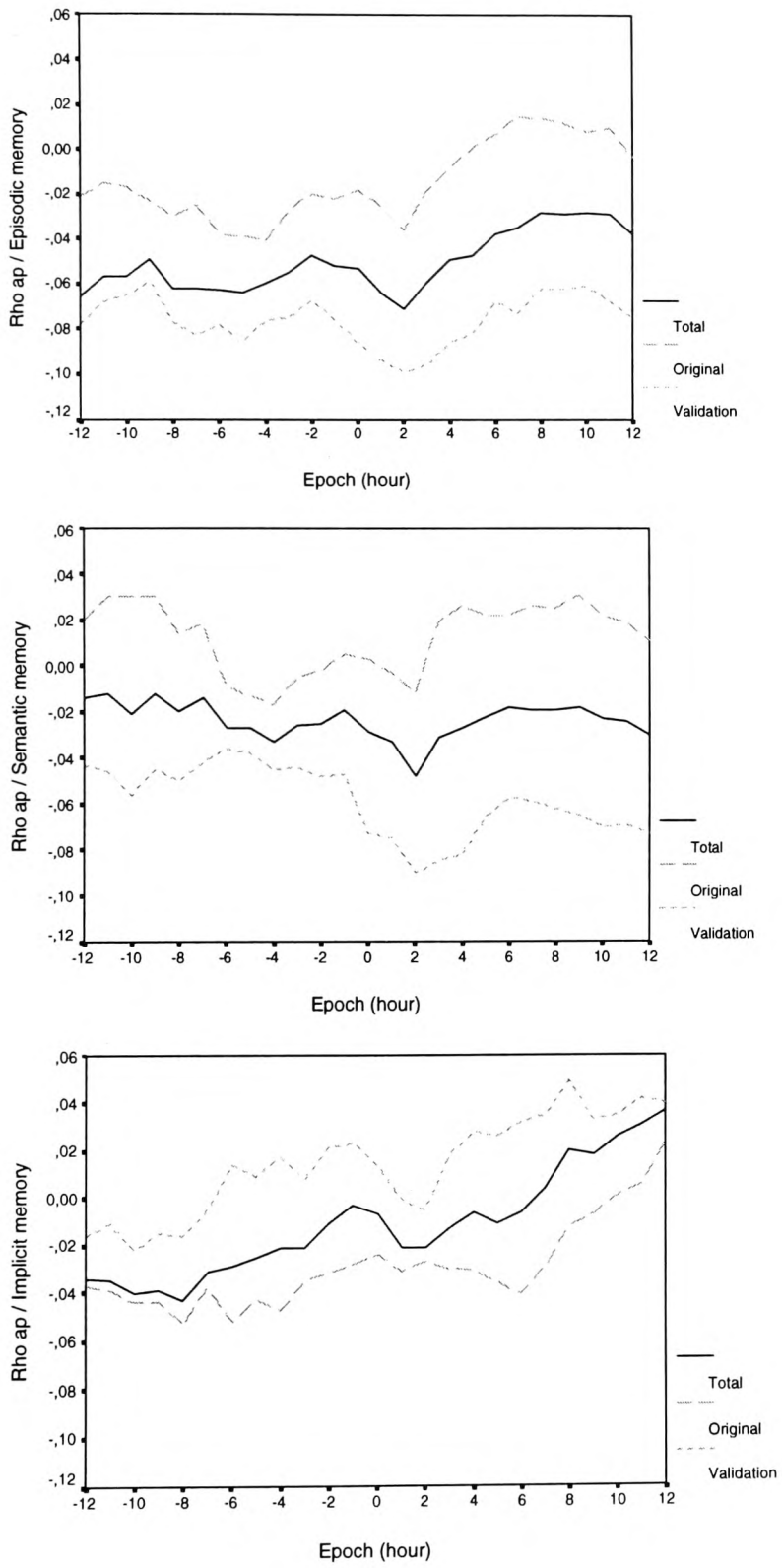


Figure 3

SPEARMAN'S RHO BETWEEN THREE MEMORY TYPES AND *AP* INDEX DATA FOR DIFFERENT EPOCHS (HOURS). ORIGINAL, VALIDATION, AND TOTAL DATA SETS



In contrast to the two other memory types, the implicit memory data showed no strong convergence at any epoch (but a small deviation from the general trend at epoch 1-2 can still be seen).

*Control analyses.*
In order to test whether our findings could be explained by the *ap*-index being confounded by some weather variable, partial correlations between *ap*-index and the three memory types were computed while controlling for air-pressure and cloudiness. Corresponding epoch analyses did not differ noticeably from those presented above.

## MEMORY PERFORMANCE VERSUS LST

*Method*

Average performance was calculated for each of the 240 LST intervals and for each of the three types of memory under study. This was done separately for the original data, the validation data and the total data set. The resulting curves were smoothed by calculating moving averages over a 2-hour window.

*Results*

As can be seen in Fig. 4, general agreement between the original and the validation data curves was not very good; this was particularly true for the left-hand portions of the episodic and semantic memory graphs, where the two curves tend to diverge rather than run in tandem (which at least in part may be due to a shortage of data points for some LST intervals).
Considering the mean memory performance curves, it is immediately clear that none of them agrees with the Spottiswoode curve, with its peak around 13.5h LST and its valley around 18h LST. Still, the curves appear to show some tendencies, with different memory performance for different values of LST. To test this, three ANOVA's with LST (0 – 23) as a between subjects factor, one for each memory type (total data set), were run. For episodic memory, there was a significant effect of LST on memory performance [$F(23, 2670) = 2.25$, $p = .001$], for semantic memory there was no significant effect of LST [$F(23, 2732) = 1.15$, $p = .284$], but for implicit memory, the effect was significant [$F(23, 2742) = 1.63$, $p = .029$]. However, in order to validate Spottiswoode's results, it is not enough that any relationship, whatever its form, can be established. In the present data, particularly good performance can be found at 7-10h LST or so. This is more than three hours before the peak in Spottiswoode's curve. And even if we permit our curves to be moved forward one hour, to allow for the possibility that the mean time of memory testing was one hour after session onset, there is still a difference in time of more than two hours.

Figure 4

MEAN MEMORY PERFORMANCE FOR THREE MEMORY TYPES VERSUS LST FOR ORIGINAL, VALIDATION, AND TOTAL DATA SETS

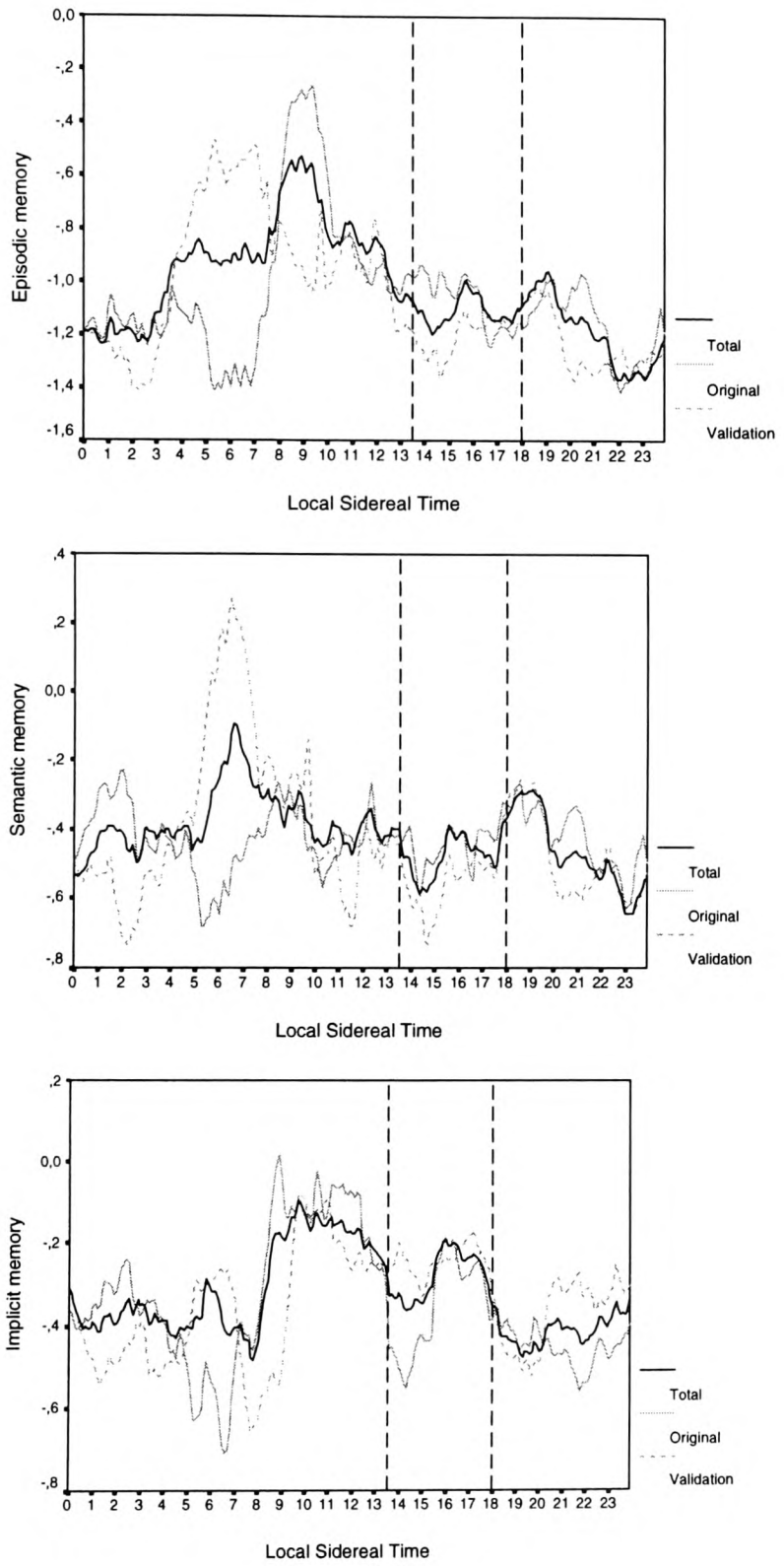
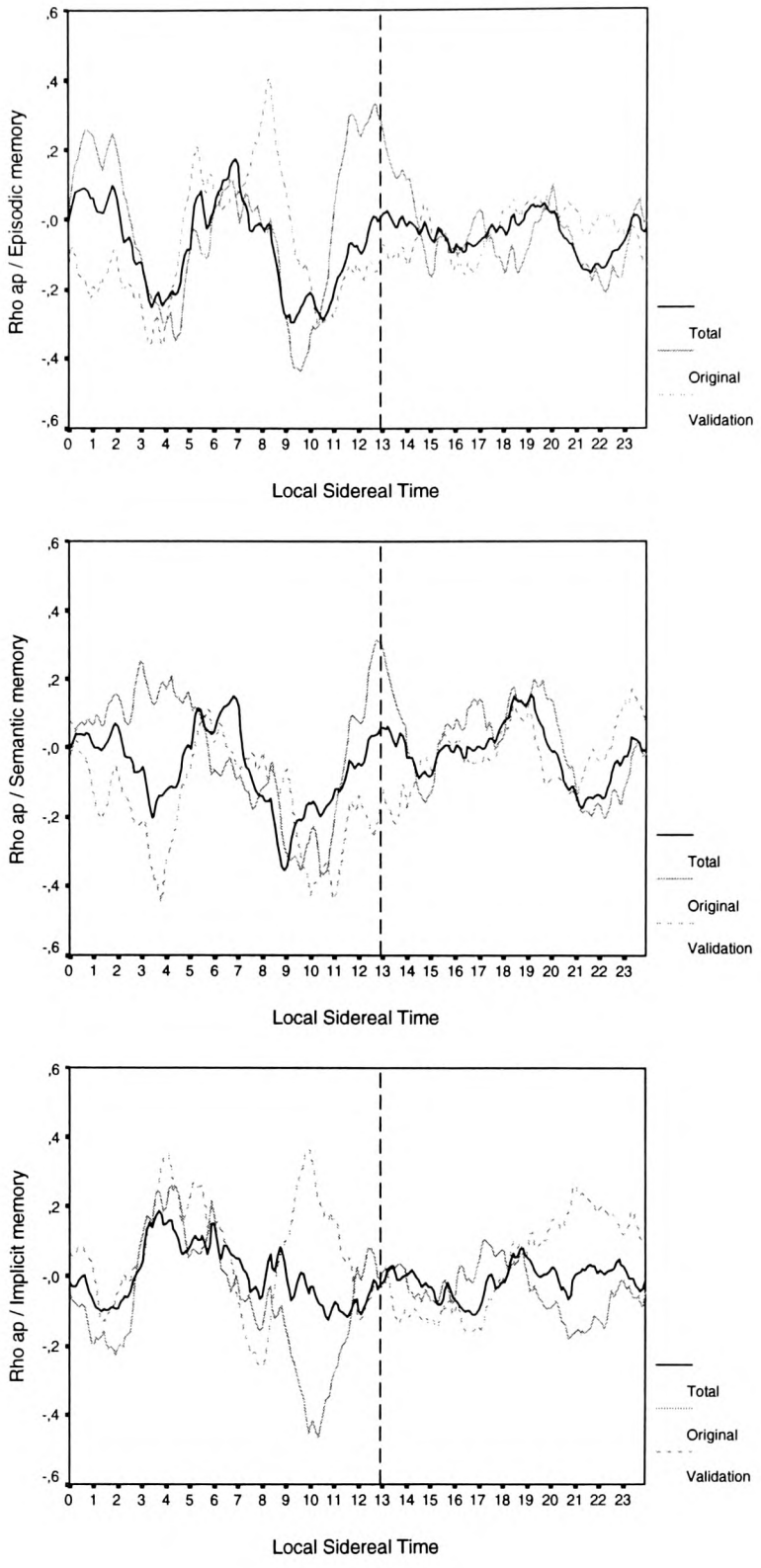


Figure 5

SPEARMAN'S *RHO* BETWEEN THREE MEMORY TYPES AND *AP* INDEX DATA VERSUS LST. ORIGINAL, VALIDATION, AND TOTAL DATA SETS



## CORRELATIONS BETWEEN MEMORY PERFORMANCE AND GMF FLUCTUATIONS VERSUS LST

*Method*

For the original, the validation and the total data set, and for each of the three types of memory, the mean performance was correlated (Spearman's rho) with the logarithmic *ap*-index at the first hour of a session for each of the 240 values of LST. The resulting curves were smoothed by calculating moving averages over a 2-hour window.

*Results*

As can be seen in Fig. 5, the agreement between the original and the validation data curves was not very good for any of the three types of memory. As in Fig. 4, this can probably be partly attributed to a shortage of data points at some LST intervals.

As can be seen from the two upper graphs in Fig. 5, for the episodic and the semantic memory data, there was an apparent, albeit small, tendency for the correlations between *ap* index and performance to be particularly low around 10h LST. This, however, is more than three hours before the time at which Spottiswoode found a marked drop in the correlation between *ap* index and AC performance. And even if we, as above, permit the curve to be moved forward by one hour, there is still a difference in time of more than two hours between the drop in Spottiswoode's curve and the drop in our curves.

As can be seen in the bottom graph in Fig. 5, for the implicit memory data, the correlations vary irregularly around zero.

Thus, the present test failed to replicate the relationship between performance as related to GMF fluctuations and LST, although some relationships of other forms were found.

## DISCUSSION

The most clear positive finding of the present study was the apparent effect of GMF fluctuations on memory tests involving episodic or semantic memory functions. It should be kept in mind, however, that significant correlations were obtained only for the episodic memory data, and that the correlations converged at least one hour later than predicted. This means that the present findings need to be confirmed and the convergence problem solved before the apparent effect of GMF fluctuations on memory can be accepted as true.

We will hopefully have the opportunity to test the reliability of the present findings on new data currently being collected in the Umeå project, as well as on earlier data from the same project. If so, we will not only analyze the relationship between GMF fluctuations and memory performance on the interindividual level, but also on the intraindividual level, thereby controlling for various individual factors, with a view to increase the power of the statistical tests.

There are at least two possible explanations for why the correlations in the hour-level analysis did not converge at epoch 0 or epoch 1, as was predicted, but at epoch 2. One is, of course, that the correlations in question were in fact spurious. As argued above, however, this explanation is not very plausible, because the correlations did converge very close to what was expected. The other explanation is that the displacement in time was attributable to random errors. This explanation is perhaps the most plausible one.

In any case, the present findings do suggest that future research on GMF fluctuations as related to various types of data, including ordinary psychological data as well as purely parapsychological data, should be a fruitful approach within parapsychology. However, in view of the fact that the energies involved are extremely small (comparable to an electric bulb being turned on or of), it should not be taken for granted that GMF fluctuations *per se* rather than some correlated variable, such as the cosmic ray, underlie the possible effects.

The results of the two sets of analyses involving LST were less clear and less positive than those involving GMF fluctuations. The failure to replicate Spottiswoode's finding of a distinct relationship between performance in free response AC experiments and LST on memory data is suggestive. It is true that an overall significant effect of LST was obtained in all tests, except for semantic memory, reflecting an increase in performance at 7-10h LST or so. But the relationship obtained between performance and LST did not resemble very closely that obtained by Spottiswoode: Not only did the best performances occur earlier in the present data than in Spottiswoode's, but there was also no counterpart in the present data to the reduced performance around 18h LST found by Spottiswoode.

We also failed to replicate Spottiswoode's finding of a distinct relationship between the correlation between GMF fluctuations and LST, mirroring that obtained for the performance as such. It is true that comparatively strong negative correlations were found around 10h LST, but as in the case of the performance analyses, this dip occurred too early to be identified with a corresponding dip in Spottiswoode's data. It is also true that effects of LST can be expected to be weaker at Umeå's latitude (63 degrees 54 m north) than at the altitude where a typical study in Spottiswoode's database was performed. The reason is that Umeå is closer to the North Pole, where the same part of the sky is always above the horizon. Umeå is, however, sufficiently far away from the North Pole to be expected to give rise to at least some effects comparable to those obtained by Spottiswoode.

Let us now return to our list of four possible explanations for Spottiswoode's findings. Along with the negative results from the previous traffic accident study, the present negative results cast some doubt on Explanations I and II – that Spottiswoode's findings are due to some direct physical effect of cosmic events on AC, or some indirect such effect, mediated by effects on an ordinary psychological state, such as arousal. In other words, along with corresponding negative findings in the previous traffic accident study, the present findings cast doubt on any interpretation of Spottiswoode's results involving physical parameters governed by cosmic events. If such parameters had been involved, it is reasonable to assume that the effects would have been revealed in our data as well, at least weak ones, but they were not.

However, in view of the fact that Spottiswoode's initial findings were replicated on a new data set (Spottiswoode, 1997a), and that the results were highly significant, it is extremely unlikely that Spottiswoode's results are attributable to pure chance (Explanation IV).

Remaining on our list of possible explanations is only number III. According to this interpretation, Spottiswoode's findings have resulted from incidental correspondences between periodic events. To illustrate how this may have happened, it is instructive to consider an effect of LST not as an effect of an astronomical time scale *per se*, but as an interaction effect of (ordinary) time of day and (ordinary) time of year. In other words, an effect of LST may be interpreted to mean that the effect of time of day on a particular dependent variable, say traffic accidents, varies depending on time of year; it is reasonable to assume, for example, that the number of traffic accidents in the evening is higher during winter, when it is dark outside, than during summer, when it is light. In the same vein, certain combinations of time of day and time of year can be particularly favorable or unfavorable when people attempt to perform well in

memory tests, *psi* experiments, or in any other task. If such combinations of time of day and time of year coincide, even partly, with some value of LST, it may give rise to spurious effects.

It is important to note that finding a factor other than LST that could account for Spottiswoode's findings does not trivialize them. Such a factor might well be a true moderator of *psi* performance and hence be of great theoretical as well as methodological value, just as LST has been thought to be.

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# DREAM GESP AND CONSENSUS VOTE: A REPLICATION

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## ABSTRACT

Consensus vote within a group setting appears to be a viable method of increasing the success of dream GESP studies. The present study is a replication of the dream GESP studies conducted by Dalton, et al., (1996), and Sherwood, et al., (1998). Four participants took part in a 16 trial dream-psi study using the same target stimuli as the original study by Dalton, et al., 1996, a target pool of 100 short video clips. Participants dreamed at home while the target was played between 3am and 4am in a remote location. Judging occurred the following day at a college dormitory room where the participants judged four video clips, consisting of 3 decoys and the target. Participants assigned ranks (1 - 4) and ratings (1 - 99) to each target individually and a group rank was calculated from the combined individual ranks. A binomial hit rate measure was prespecified as the outcome for this study, with a rank of 1 or 2 to the actual target considered a 'hit' (MCE = .50), and ranks of 3 or 4 considered a 'miss'.

Study hypotheses were: H1) the hit rate (rank of 1 or 2) for the group consensus judging method would be significantly higher than mean chance expectation; H2) the direct hit rate (rank of 1 only) for the negative emotion targets would be significantly higher than mean chance expectation. Overall group hitting was significant with 13 hits in 16 trials, $p = .01$, ES(h)= .46, representing a hit rate of 81% for the group. The direct hit rate (3 first place ranks out of 5 trials) for the negative emotion targets was 60%, ES(h) = .73, but was not significant ($p = .098$) because of the small number of trials.

Exploratory hypotheses investigated whether the two female participants would score significantly better than MCE. This hypothesis was partially confirmed in that one of the two female participants exceeded chance, with 14 hits (rank of 1 or 2) in 16 trials, which is significant at $p = .002$, and a hit rate of 87%. The other female scored the same as the two male participants in the study, with 10 hits in 16 trials ($p = .227$, ns). The second exploratory hypothesis – that the direct hit rate for the negative emotion targets would be significantly higher than MCE for individuals - was not confirmed. While the direct hit rate for negative emotion targets was suggestively higher than the mean chance expectation for two of the individuals ($p = .098$, ES(h) = .73), only three of the four participants evidenced most of their individual hits (rank of 1 only) on the negative dreams, with the remaining participant obtaining most of their hits on positive targets.

## INTRODUCTION

Building on numerous anecdotal and clinical reports concerning ESP in dreams (Freud, 1953; Gurney, Myers & Podmore, 1886; Rhine, 1961; 1962), experimental research has also found that the dream state seems to be conducive to psi (Braud, 1976; Child, Kanthamani & Sweeney, 1977; Dalton, Steinkamp & Sherwood, 1996; Sherwood, Dalton, Steinkamp & Watt, 1998; White, Krippner, Ullman & Honorton, 1971; Ullman, 1989; Ullman & Krippner with Vaughan, 1989).

In particular, recent studies examining the use of consensus vote to facilitate the judging process in dream GESP studies have demonstrated a level of success with this technique. Some studies have used majority-vote or pooled rating/ranking procedures in order to try to maximize ESP performance (Fiske & West, 1956, 1957; Ryzl, 1966; Braud, 1977; Kanthamani, Khilji & Rustomji-Kerns, 1989; Kanthamani & Khilji, 1990; Thouless, 1960). Carpenter (1995) has used group consensus judgements of the contents of regular quasi-psychotherapeutic group meetings as a method of facilitating ESP. A previous dream GESP study involving the first author (Dalton, Steinkamp & Sherwood, 1996) used a consensus vote judging procedure involving three participants and found that this method yielded a higher number of direct hits than individual judgements. Dream target stimuli in the Dalton, et al., 1996 study consisted of one minute

video clips with accompanying sound track. Participants dreamed at home, recording their dreams throughout the night, then came into the laboratory the following morning to judge four video clips, consisting of 3 decoys and the target. Overall group hitting was significant with 15 direct hits for 32 trials ($p < .006$, ES(h)= .46). Two of the three participants (one male, one female) also obtained independent significant scoring, both achieving 13 direct hits in 32 trials, which is significant for each at $p = .038$, ES(h) = .33. An interesting factor to come from this study was the impact of target emotionality on how well participants seemed to pick up on dream material. After accounting for the availability of negative target material within the target pool, and the number of times a 'negative' video clip was chosen as a target, participants still showed a significant response to the presentation of negative target stimuli in the dream state ($p = .006$).

Spontaneous cases of dream GESP frequently contain emotional information which is often negative (L. Rhine, 1961, 1981; Ullman, et al., 1989; Van de Castle, 1977) and evidence from some experimental studies of GESP suggests that emotional target materials are more conducive than neutral materials (Bierman, 1995, 1997; Moss & Gengerelli, 1968; Gelade & Harvie, 1975; Radin, 1997). Some researchers have suggested that a certain amount of vigilance takes place in the dream state (Tolaas, 1986; Ullman, 1986, 1990), resulting in a continued unconscious scanning of the environment to monitor any possible physical or psychological threats to our well-being. Krippner (1975) furthers this view in stating that emotional stimuli may be more effective in dream experiments than in non-dream experiments. Sherwood (Sherwood, et al., 1998) has speculated as to why sleep, and emotionally negative target material, might be conducive to dream ESP. The occurrence of psi in the dream state makes sense in evolutionary terms, as some organisms are more likely to be at risk while they are asleep. It has also been suggested that the periodical appearance of REM sleep and dreams provides a vigilance mechanism, which is oriented to the present and the future, with an anticipatory arousal mechanism which counteracts these risks (Tolaas, 1986; Ullman, 1990). The dream vigilance mechanism would come into operation during each sleep cycle and would result in the awakening of the organism if a potential threat was identified and considered to be of sufficient importance. If no threat was perceived, the sleep cycle resumed, with a return to non-REM sleep. Ullman (1986) has suggested that there might be an ESP component within this mechanism which monitors information which is distant in terms of space and time. He goes on to suggest that, as society has developed, the dream vigilance mechanism has become focused on potential psychological rather than physical dangers and, in particular, to events which might disrupt connections with significant others. Sherwood, et al., (1998) further speculates that if such a mechanism does exist, it might explain why many spontaneous cases of dream ESP feature emotionally-close persons and negative life events, and may also explain why negative target materials may be more conducive to dream ESP in the laboratory than either positive or neutral materials.

A follow-on study to the Dalton, et al., (1996) research was designed to allow further exploration of both the consensus vote method and target emotionality. The dream-psi study conducted by Sherwood, Dalton, Steinkamp, and Watt (1998) investigated whether individual versus small group consensus judging procedures, and the emotionality of dynamic target video clips (specifically negative target material), would affect the frequency of correct identification of the target in a free-response dream GESP study. Dream target stimuli in the Sherwood, et al., study also consisted of one minute video clips with accompanying sound track, and participants once again dreamed at home, recording their dreams throughout the night, then came into the laboratory the following morning to judge the four video clips. Participants obtained a greater number of direct hits using consensus as opposed to individual judgements, with 12 hits in 28 trials, $p = 0.029$, ES(h)= 0.38. As in the prior study, one of the female members of this group demonstrated a better

hit rate than the others (32% vs. 25%). Participants, both as a group and as individuals, obtained a greater proportion of direct hits when the target was emotionally negative than when it was either positive or neutral. The direct hit rate for negative emotion targets was significantly higher than mean chance expectation, p = 0.027, ES(h)= 0.79 (Sherwood, et al., 1998).

The present study attempted to address the emotionality question by comparing the direct hit rate (i.e., the number of times the target clip was correctly identified and given a rank of 1) for positive, negative and emotionally neutral target video clips. More specifically, it was hypothesized that the group would score significantly higher than mean chance expectation (MCE, or the number of time the target clip is expected to be correctly identified simply by chance) when the targets were negative, in keeping with similar findings in the previous two dream GESP studies by Dalton, et al., 1996 and Sherwood, et al., 1998.

The two dream studies just discussed (Dalton & Sherwood) would seem to provide support for the occurrence of ESP during the dream state but would also indicate that information received by more than one person was required in order to make judgements that were more accurate than chance expectation. The consensus vote technique set within the confines of a small group setting would then seem to be indicated as the best means of assessing the veracity of this approach.

The present study was a replication and extension of two previous dream GESP studies (Dalton, et al, 1996, and Sherwood, et al., 1998) and was conducted by the last four authors (Novotny, Sickafoose, Burrone and Phillips) under the supervision of the first two authors (Dalton and Utts) as part of course requirements in an honors course taught by Dalton and Utts. Study design was to investigate the facilitation of success in GESP dream-psi studies through the use of consensus vote in a small group setting and whether the emotionality of the dynamic target video clips would influence task performance. Due to the time restrictions of the course, 16 trials were estimated to be the most that the participants could manage, and were prespecified before the study began. This study was slightly different to the previous two in that four participants made up the dream group (or the 'dream team', as they were called) rather than three participants, and there were slightly fewer trials (16 vs. 28 in the Sherwood, et al., study and 32 in the Dalton, et al., study).

## HYPOTHESES

H1 The direct hit rate (rank of 1 or 2) for the group consensus judging method would be significantly higher than the MCE.

H2 The direct hit rate (rank of 1) for the negative emotion targets for the group would be significantly higher than the MCE.

Because the previous studieshad shown slightly better hit rates for one of the females in the studies, it was decided to explore this further in the exploratory hypothesis, along with the impact of negative target material for individuals in the group.

Exploratory Hypotheses:

1. The direct hit rate for the two female participants would be significantly higher than the MCE.
2. The direct hit rate for the negative emotion targets would be significantly higher than the MCE for each individual.

## METHOD

*Design*

This study used an ostensibly clairvoyant design although possible precognition can not be ruled out. Sixteen trials were prespecified as part of a repeated measures design. The experimental trials were carried out between 7 January and 9 March, 1998.

Four of the authors (GN, LS, JB and CP) acted both as experimenters and as participants, and were part of a honors course on using statistics to test psychic claims taught by the first two authors (KD and JU). KD and JU acted as supervisors and data handlers for the study. KD was responsible for system set up for the selection and subsequent display of the target for each trial and JU was responsible for double-checking the raw data and the statistical analyses.

All four participants reported having good dream recall and imagery, a positive attitude toward GESP in the dream state, and generally experienced more than one dream per night on a regular basis. Although the amount of recalled dream imagery varied from trial to trial and between individuals as well, participants overall averaged 2-4 different dreams per night on trial nights.

*Equipment*

The VCR used for the study was a NTSC format four-head Mitsubishi HS-U5445 with a repeat function, attached to a 27-inch NTSC format RCA Colortrak stereo monitor.

*Procedure*

The target pool consisted of 100 different video clips with accompanying sound tracks, taken from films, TV programs, and cartoons, all exactly a minute long within a fraction of a second, and divided into 25 groups of four. This target pool was the same as that used in the Dalton, et al., 1996 study, and was developed for automated ganzfeld studies at Edinburgh University, Scotland. For the trials a psuedo-RNG was used to randomly generate both the pool numbers and the target number for that trial for the entire series of 16 trials before the study began. An assistant generated this information, sealed a copy of the target information into an envelope and mailed it to a neutral third party before the study began so that no-one directly involved with the study had access to this information prior to the completion of the study. The information was then stored on KD's home computer so that at the beginning of each trial she could type in the session number and the computer would return both the pool number and the target number within that pool for that night's session. After obtaining the pool number and the target number, KD would then set the appropriate time index for the one minute clip to be shown repeatedly on the VCR, using the VCR repeat function. This was predetermined to be at approximately 3am for each trial. In this way, the VCR could be manually started at 3am and the clip would be shown repeatedly between the hours of 3am and 4am. After setting the VCR, KD then called the voice mail for the secretary for the statistics department and left a message containing the pool number to be given to the participants the following morning. The lights in the target room were then turned off and the door to this room closed for the duration of the trial. The target room was on the second floor of a building located approximately 20 miles away from the student housing and dormitory rooms.

Participants dreamed remotely from their respective homes, writing their dreams down as they awoke spontaneously throughout the night or upon awakening in the morning. The following day they brought their hand-written dream records into the dorm room of one of them (typically LS or CP) for comparison to

the four target possibilities. Participants who did not consciously recall their dreams of the previous night were still asked to view and judge the target material on the premise that, as everyone dreams several times a night whether they remember it or not, they may still react subconsciously to the correct target material, even if that reaction was only a 'feeling' that one of the four possibilities was the correct target. Once gathered in the dorm room, the judging procedure would commence. The judging procedure used by Dalton, et al., and Sherwood, et al., in their studies, adapted from Carpenter (1987) for reaching a consensus vote in a group setting, was used as the basis for the judging procedure in this study and went as follows: One of the participants would phone the statistics department secretary and receive the pool number to access on the judging tape. The four possible target clips were then viewed by the participants, with the opportunity to view any of the four again after seeing all four completely through once. Participants then individually judged each clip by assigning it a rank of 1 - 4 (1 representing the greatest degree of correspondence with dream imagery), and giving each possible clip a rating between 1 - 99 (first choice getting the highest rating). Ratings and ranks were hand noted by each participant on their dream report sheets and considered final for individuals and not subject to change after the sharing aloud of dream material.

After each participant had written down their final ratings and ranks, each would then share their night's dreams and report the rating and rank they had assigned to each clip, which one of them would write down on the session record sheet. The ranks for each clip were then added up and the clip with the lowest score given first place, the next lowest given second place, and so on. In the eventuality of ties, the ratings were added up and the clip with the highest rating was given the rank in question, with the lower rating taking the next rank. In the eventuality of a tie between ratings, the variance in ratings was taken into account. It was reasoned that a tighter variance would indicate a greater consensus on that target, and thus the clip with the lower variance received the lower of the remaining ranks. Group ranks and ratings were double-checked by one of the other participants and then one of them would call KD with the information. KD would record the information for both the individual ranks and the group rank before providing feedback as to the identity of the target.

At the end of the study, the data recorded by KD was compared to that recorded by the participants, and both of these were compared to the target information held by the neutral third party for discrepancies before any data were analyzed. No discrepancies were found.

Table 1:
DISTRIBUTION OF RANKS FOR GROUP

| Rank | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Obtained | 7 | 6 | 2 | 1 |
| Expected | 4 | 4 | 4 | 4 |

## RESULTS

The first hypothesis for this study - that the direct hit rate for the group would exceed MCE - was confirmed. There were 13 hits (rank of 1 or 2) for the group in 16 trials, which is significant at p = .011, ES(h)= .46 and represents a hit rate of 81% for the group. (All p values are exact binomial, one-tailed unless otherwise specified). For completeness, the distribution of ranks for the group is shown in Table 1.

Following the standard put forth in the prior studies, the analyses for the second hypothesis used only targets receiving a rank of 1 (direct hit) in order to more easily compare results among the three studies. The second hypothesis – that the hit rate for the negative emotion targets for the group would be significantly higher than mean chance expectation – was not confirmed because of the low number of trials with negative targets (5). The direct hit rate for the 5 negative emotion targets was 60%, ES(h) = .73 (p = .098), an effect size that is very similar to that obtained in the Sherwood, et al., (1998) study, ES(h)= .79.

Prior to the original Dalton, et al., (1996) study, three independent blind judges rated the emotional impact of each of the 100 targets in the dream study pool either a positive impact, a negative impact, or as neutral. This evaluation revealed 35 emotionally positive targets, 32 emotionally negative, and 33 emotionally neutral targets comprising the study pool. The total number of direct hits (rank of 1 only) in the study was seven for sixteen trials. When these seven targets are separated into their emotionality categories we see the percentage of each category in this study (Table 2).

Table 2
PERCENTAGE OF DIRECT HITS BY TARGET TYPE (TOTAL HITS = 7)

| | Positive Targets | Negative Targets | Neutral Targets |
|---|---|---|---|
| Hits | 1 | 3 | 3 |
| % of Total Hits | 1 / 7 = 14% | 3 / 7 = 42% | 3 / 7 = 42% |

From Table 2 it would appear that a large portion of the hits were split between negative and neutral targets - but this information is meaningless without knowledge of the distribution of positive, negative or neutral targets within the pool of selected targets. Table 3 shows how often a particular type of target was chosen and its availability within the target pool of 100, i.e., there were 35 positive clips available for selection as targets within the pool of 100, 32 negative clips available for selection as targets, and so on. Targets were selected with replacement.

Table 3
TARGET TYPE AVAILABILITY WITHIN POOL

| | Positive Targets | Negative Targets | Neutral Targets |
|---|---|---|---|
| Target Type Availability | 35 | 32 | 33 |
| Times Selected As Target | 5 | 5 | 6 |
| % of Category | 14% | 16% | 18% |
| Direct Hit | 1 | 3 | 3 |
| % of Direct Hits | 1 / 5 = 20% | 3 / 5 = 60% | 3 / 6 = 50% |

Table 3 shows that the neutral targets were selected by the computer most often (38%), with negative targets and positive targets each selected 31% of the time. Table 3 also shows the number of times each type was correctly chosen by the group as the target. This is a more accurate representation of how well the different target types did. The last two rows in Table 3 depict the number and percentage of times each target was correctly chosen and this demonstrates that the participants were most successful with the negative targets, getting a 60% hit rate, $p = .098$, $ES(h) = .73$. This is followed by neutral targets with a hit rate of 50%, and positive targets having the lowest response rate with a hit rate of only 20%. Although the number of trials was too small to reach statistical significance in this study, the hit rates and associated effect sizes still show support for both hypothesis 2 and the previous literature on emotional stimuli and vigilance in the dream state.

## EXPLORATORY HYPOTHESES

In the original GESP dream study with consensus voting (Dalton, et al., 1996) two of the three participants obtained independent significant scoring, both achieving 13 direct hits in 32 trials, significant for each at $p = .038$, $ES(h)= .33$. The first of our exploratory hypotheses also dealt with this issue in that we planned to explore whether the two female participants would score significantly better than MCE. This hypothesis was only partially confirmed in that only one of the two female participants exceeded chance, with 14 hits (rank of 1 or 2) in 16 trials, which is significant at $p = .002$, and a hit rate of 87%. The other female scored the same as the two male participants in the study, with 10 hits in 16 trials ($p = .227$, $ES(h) = .77$, hit rate 62%).

For completeness, the distribution of ranks by participant is shown in Table 4, with the two female participants listed first. It must be noted here that due to the possibility of a stacking effect these results cannot be considered to be independent of each other, or of the result in Hypothesis 1.

Table 4
DISTRIBUTION OF RANKS FOR INDIVIDUALS

| Rank | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| LS | 6 | 8 | 2 | 0 |
| CP | 5 | 5 | 4 | 2 |
| GN | 4 | 6 | 4 | 2 |
| JB | 4 | 6 | 3 | 5 |
| Group | 7 | 6 | 2 | 1 |

Exploratory hypothesis 2 - the direct hit rate for the negative emotion targets would be significantly higher than mean chance expectation for individuals - was not confirmed. Three of the four participants evidenced a large portion of their individual hits (rank of 1 only) on the negative dreams but fell short of significance while one participant obtained most of their hits on the positive targets, as is shown in Table 5.

Table 5
DISTRIBUTION OF RANKS FOR INDIVIDUALS

| Target Clip | Positive | Negative | Neutral | Row Total |
|---|---|---|---|---|
| Times Selected As Target | 5 | 5 | 6 | 16 |
| Participant LS | 1 (20.0%) | 3 (60.0%) | 2 (33.3%) | 6 |
| Participant CP | 1 (20.0%) | 3 (60.0%) | 1 (16.6%) | 5 |
| Participant GN | 1 (20.0%) | 2 (40.0%) | 1 (16.6%) | 4 |
| Participant JB | 2 (40.0%) | 1 (20.0%) | 1 (16.6%) | 4 |

The direct hit rate for negative emotion targets was suggestively higher than the mean chance expectation for two (LS & CP) of the individuals ($p = .098$, $ES(h) = .73$). Although the number of trials available for analysis was too small to reach statistical significance for this study, these results do provide support for similar findings in the prior two dream studies as well as previous literature on emotional stimuli and vigilance in the dream state.

## DISCUSSION

This study was a fairly successful replication of previous dream GESP studies (Dalton, et al., 1996; Sherwood, et al., 1998) with consensus voting judging procedures and emotional (particularly negative) target video clips being associated with greater success in an ESP task ($p = .01$, ES(h)= .46). This finding, that consensus judging procedures might be conducive to ESP, perhaps more so than individual procedures, supports previous findings for both dream GESP (e.g., Braud, 1977; Kanthamani, et al., 1989; Kanthamani & Khilji, 1990) and waking GESP (e.g., Fiske & West, 1956, 1957; Kennedy, 1979).

In order to facilitate understanding of how the current study compares to its predecessors (Dalton, et al., 1996; Sherwood, et al., 1998) the results from this study are shown here in terms of direct hits (ranks of 1 only) and effect size (see Table 6).

Table 6
COMPARISON OF PRESENT STUDY TO DALTON, ET AL., & SHERWOOD, ET AL.

| | Direct Hits / Trials | Direct Hit Rate | Effect Size |
|---|---|---|---|
| Present Study, 2000 | 7 / 16 | 44% | .40 |
| Dalton, et al., 1996 | 15 / 32 | 47% | .46 |
| Sherwood, et al., 1998 | 12 / 28 | 43% | .38 |

The effect size for the current study (ES(h)= .40) compares well to the two previous studies, falling between the two values obtained in those studies; Dalton, et al., ES(h)= .46; and Sherwood, et al., ES(h)= .38. A value of h= 0.20 is considered to be a small effect, and a value of h= 0.50, a medium effect size (Rosenthal & Rosnow, 1991). While the effect sizes associated with these studies can be considered to be on the small side, they can also be considered to be fairly consistent. As is shown in Table 6, the hit rates for the three studies are also comparable, with the present study again falling between the 43% in the Sherwood, et al., study and the 47% obtained in Dalton, et al.

So why does the consensus vote seem to promote a more successful outcome for GESP dream studies? If ESP has a relatively weak effect then it seems likely that a combination of extrasensorially perceived information relating to the same target from more than one person might boost the accuracy of target judgements to a significant level. However, the results presented here, as in the previous two dream studies, must be interpreted with some caution. Looking at the success of a judging procedure involving a single overall consensus call per trial, based on several individuals, is different from looking at the number of hits per trial based on the individual calls of several individuals per trial. In the latter case, one cannot rule out the possibility that the overall score may be partially due to a stacking effect. If more than one call is made per trial then the likelihood of a hit is increased because there is more than one chance of getting it correct. In the present study it is possible that our overall results may also have been partially biased by the stacking effect as we reported both individual and group performance, which are not independent.

The group results for emotional target type were also of a similar magnitude with the two previous studies in that both the individual and the group judgements obtained a greater number of direct hits when

the targets were emotional as opposed to neutral; in other words, performance was best when the targets were negative. However, it is our feeling that the findings regarding the emotionality of the target material should be treated with caution for the following reasons: (1) the comparison is based on a small number of trials, and (2) it is impossible to rule out the possibility of a participant response bias towards selecting negative clips as being the target. Future dream ESP studies may want to consider a target pool made up of either entirely or primarily negative target material, to minimize the possibility of a response bias and to maximize the potential of psi success.

Another aspect of the study design which may have contributed to the success of the GESP dream studies under discussion is that all sessions were conducted in the familiar environment of the participants homes and without the facilities of a formal dream/sleep laboratory. This helps to maintain a relaxed and fairly informal atmosphere, features which have been found to be conducive in other small group dream ESP research (Ullman, 1989). Upon reflection of the study design, it is the feeling of the first author (KD) that those groups comprised of three individuals are able to establish a more cohesive group, creating an ambience of safety, comfort and friendship, within which to share dreams and conduct judging, with one member always available to break ties or stalemates between the two others when voting as a group. The group of four in the present study reported finding themselves 'stuck' during judging due to difficult ties or strong personalities within the group with contradictory points of view, sometimes leading to arguments. Similarly, the Sherwood study found that a group of only two (the Edinburgh participants) found it more difficult to easily resolve 'hard' ties without a 'tiebreaker' person. It would be our recommendation that future dream studies with groups use odd numbers of participants, with three being the optimal setting. We feel that these studies serve to illustrate that home-based dream GESP research may continue to be a promising technique for the experimental study of ESP, particularly if it utilizes emotionally dynamic target materials and consensus judging procedures, and would encourage this approach as a method of conducting GESP/dream research.

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# PARANORMAL EXPERIENCES IN THE GERMAN POPULATION: CONCEPTION AND REALIZATION OF AN EMPIRICAL STUDY

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## ABSTRACT

This paper describes the theoretical background, development, conception and methodical application of the current IGPP research project "Paranormal experiences. An empirical investigation into their incidence, content and structure". The subject of our research is so-called spontaneous cases, or in other words, unusual experiences. We focus on reports of parapsychological phenomena which can be generally described as subjective experiences that contradict society's understanding (the "common" sense) of what experiences usually entail. Such experiences belong to the classical corpus of scientific parapsychology and have a tradition in IGPP history, too. The spectrum covers many themes from premonition and precognition to psychokinetic phenomena and includes UFO sightings, too.

The project's aim is to conduct a representative survey to measure the incidence of those experiences in the population. It is also dedicated to the reports and accounts of the exceptional experiences themselves; here - in contrast to the first part of the investigation - the focus of interest is the experience itself. The people will be asked to report their experiences and we assume that their content, structure and interpretation will vary.

We will report (i) how our theoretical understanding and a sociological perspective can influence the approach to this question, (ii) which research interests we will pursue and (iii) how we converted this into an empirical research design. Our first results will be presented to show the advantages of our methodical procedure which can be described as a combination of quantitative and qualitative research methods and thus represents - compared with existing investigations - an innovative enterprise.

## INTRODUCTION

When dealing with people's living experiences it may be appropriate to begin by listening to the voice of the people. So let's start with a little story published on the Internet:[1]

> "There was an incident one night that stands out. My wife and I were sleeping when around 2:00 AM a noise woke me up and I saw a man open our bedroom door and walk out. I immediately got up and rushed out to catch this person who had gotten into our house but there was no footsteps, no person, and every door and window was intact and locked. This man had just vanished. I believe to this day I was looking at a spirit." (anonymous)

This report seems to be typical of the sort of puzzling experiences reported by some people: the so-called spontaneous cases, or in other terms paranormal, exceptional or psychic experiences. Such experiences are often considered to be inexplicable by the normal senses or processes of perception, communication or understanding. They belong to the classical field of the scientific parapsychology[2], although other research disciplines have occupied the field too.

[1] http://members.tripod.com/bestsource/trstories.html (13.4.2000)

[2] With the growing importance of science during the eighteen century, paranormal experiences were considered a topic of scientific inquiry and the expressed purpose was to investigate, organize and systematize the field of phenomena designated by such terms as mesmeric, psychical, or spiritualistic. Also, the beginning of the scientific parapsychology starts not at least because of the increasing awareness of the occurrence of a wide variety of *spontaneous* experiences. The first systematic investigations of paranormal phenomena set out to prove the existence of such phenomena. (For more historical aspects of the study of paranormal phenomena which later became known as spontaneous experiences, see e.g. BELOFF, J. (1991), or MCCLENON, J. (1984).

With our current project dedicated to incidence, content and structure of exceptional experiences in the general German population the IGPP revived an important earlier research activity: collecting and analyzing so-called spontaneous cases. Due to the popularity of Hans Bender and his public relation work at the very beginning of the institute's foundation in 1950 a wealth of reports of personal experiences reached the IGPP from all strata of the general population. An extensive analysis of a collection of over a thousand of these reports was made in the late fifties by Gerhard Sannwald (1959/60). The aim of this study was to evaluate statistically the material with regard to formal categories as used by Louisa Rhine and with regard to some of the psychological circumstances surrounding the event. Another investigation into this subject was published in 1971 by Erhard Hanefeld. With regard to formal categories Hanefeld (1971) analysed about 1500 reports which were sent to a German mass newspaper in response to an announcement.

More on a trial basis, the very first survey based on a random sample representative for the German population was made by Hans Bender in 1958. In a poll conducted in co-operation with Elisabeth Noelle-Neumann and her renowned opinion research institute in Allensbach he asked about the occurrence of second sight experiences. Eleven percent of 2000 persons asked by questionnaire had such an experience. In a second part of this investigation Bender tried to collect written reports of the events, but he failed for methodical reasons which simply resulted in a lack of participation.[3]

Since that time no similar survey has been done by the IGPP. With our current project presented here and our aim of conducting a representative survey of paranormal experiences in the German population we follow in Bender's footsteps. But unlike him our interest is not focussed only on a single type of paranormal experience. As we will show later, we are consciously dealing with a larger spectrum of experiences of which in our society are conceived to different degrees as lying within or beyond the frontiers of normality.

The study of spontaneous cases belongs from the very beginning to the classical field of scientific parapsychology. Over time a large number of studies with different strategies and foci have been conducted. Normally the following basic approaches can be identified: The first is the question of how psi or extrasensory perception works. In this approach the underlying assumption is that the phenomena really did occur as reported and could be evidence for psi. The fact that a lot of people report such phenomena is seen to be proof for the existence of so-called psychic reality. The second approach is the more neutral question about possible connections between paranormal experiences and social, psychological or individual factors. The third approach is the more subject-centered question of the impact of those experiences on the experiencer. Additionally, there is a relatively new approach discussing more theoretical and methodological problems of the investigation of spontaneous case studies or surveys.

Of course our own research program is based on existing investigations, but it also includes some important new aspects. We want to present the theoretical background to our investigation and to show how our research goals have been transformed into a suitable empirical program.

[3] For more background information see DEFLORIN, R. & SCHMIED, I. (1999).

## HOW MANY? SO MANY! – FREQUENCY OF PARANORMAL EXPERIENCES

Looking back, there have been a number of attempts to count and classify the occurrence of paranormal experiences.[4] At least three critical reflections should be mentioned:

*(1) Breadth of experiences and the necessity to qualify the statistical rates*

If we look at representative investigations as a whole, we detect a relatively large breadth of unusual experiences such as hallucination, precognition, dreaming, premonition, feeling of déjà vu etc. Look, for instance, at the following recent survey. It was conducted in 1991 by the Gallup Institute, USA. More than one thousand US citizens were interviewed about their belief in paranormal phenomena and about self-experienced unusual experiences. Here are some remarkable results (table 1):[5]

Table 1:
FREQUENCY OF PARANORMAL EXPERIENCES

| Type of experience | % |
|---|---|
| Feeling of déjà vu | 56 |
| Telepathy | 25 |
| Contact with the dead | 17 |
| Poltergeist (haunted house) | 14 |
| Apparition (presence of a "ghost") | 9 |
| Psychokinesis | 7 |

The percentages ranging from 7 % up to more than 50 % show an impressive response rate that can also be found in similar studies.[6] For example, every second person had experienced so-called déjà vu. Maybe déjà vu is not only the most frequent experience but also a simple and well-known example to explain the general structure of unusual experiences. Someone who reports déjà vu or a similar experience generally mentions a feeling of confusion or irritation. This results from the impression that something is happening which is normally impossible. In such puzzling moments there seems to be a transcendence of

[4] First systematic inquiries were conducted by the S.P.R: GURNEY, E., MYERS, F.W.H. & PODMORE, F. (1886) and SIDGWICK, H. ET AL. (1894). Meanwhile there has been a large number of scientific investigations dealing with spontaneous cases including many empirical studies. The following papers offer a good overview: ALVARADO, C.S. (1996), STOKES, D.M. (1997), or WHITE, R. (1992).

[5] From: GALLUP, G.H. & NEWPORT, F. (1991).

[6] e.g. for Great Britain: GURNEY, E., MYERS, F.W.H. & PODMORE, F. (1886): 12 % hallucinations/apparitions; SIDGWICK, H. ET AL. (1894), Census of Hallucinations: 10 % hallucinations/apparitions; WEST, D.J. (1990): 33 % paranormal experiences, 11 % hallucinations/apparitions, 16 % premonitions; 5 % PK; for the U.S.: PALMER, J. (1979): 17 % hallucinations/apparitions, 36-39 % ESP (telepathy/clairvoyance/premonition), 70-90 % déjà vu, 6-8 % poltergeist; for Europe (rates for Germany in brackets): EUROPÄISCHE WERTESTUDIE (1981-84): 46 % (49) any, 34 % (38) telepathy, 21 % (17) clairvoyance, 25 % (28) contact with the dead.

time and space which actually doesn't correspond to society's norms. Nevertheless innumerable surveys and polls show that there are a lot of people experiencing paranormal things.

On the other hand it is necessary to question the mere statistics. Standardized investigations are confronted with a general dilemma. On the one hand the aim and object of standardization by using categories is to reduce complexity in a meaningful way. Only common features are considered. On the other hand categories involve the risk of inappropriately reducing of diversity, of oversimplifying or even of distorting. Since categories lead to standardized answers, the result could be a uniformity that actually doesn't exist in real life. For instance, it is simply impossible to completely classify the diversity of human experience. The problem is particularly acute with the chimerical phenomena parapsychologists are dealing with. Even the best phrased item will not eliminate the problem of individual interpretations of terms and situations on the part of the person questioned. For instance, in Gallup's poll mentioned above 25 % of the people asked answered yes to the item "Felt that you were in touch with or getting a message from someone who was far away without using the traditional five senses". The investigators' intention is to record statistically the rate of cases of so-called telepathy. But in human life there are many ways to feel closeness in spite of distance and also many reasons to "feel" the question fits with one's individual situation. To be honest, it is seriously doubtful whether one is really dealing with telepathy as parapsychologists define it. It is known that the facts are different. A standardized answer is not the whole truth. It is a big disadvantage of usual investigations in the field that they have generally confined themselves to quantitative-statistical statements and percentages, without referring to the subjective reports behind the yes-no answers to the items. In order to avoid artefacts and to gain a more subtly differentiated understanding of subjective experience an innovative aspect of our study consists in also collecting the experiential reports themselves and looking behind the easy but standardized "yes".

*(2) The general population as a research subject*

A second critical reflection concerns the point of *representativity*. Doing a representative survey for the German population entails dealing with ordinary, normal people and, of course, with a wide spectrum of human experiences. So it would be fairly inappropriate to assume that such experiences - whatever they are – are only simple effects of personal belief in paranormal reality or of psychopathological conditions. Remembering Gallup's data, nobody would say that up to 50 % of the population have mental disorders or nervous troubles. What we hope to attain is an open and unbiased understanding of the people and their experiences. Through a careful interpretation of both – the statistical rates *plus* the individual contents – we'll be able to reconstruct the particular structure of these peculiar experiences without offering an ontological interpretation.

*(3) Research gap in Germany*

A third critical remark concerns the spontaneous case research situation in Germany. As mentioned above, there is a large amount of data on the frequency of exceptional experiences in the general population for many countries, but not for Germany. During the last thirty years no similar extensive investigation has been done. Actually, we note a general shift towards experimental work. Our large-scale project is thanks to the expanded research possibilities at the IGPP in recent years. So we see a good chance for filling a research gap in a fruitful way by carrying out a standardized poll in the general population as well as listening to the voice of the people. We will maintain a living science only if we don't lose our awareness of the natural roots of parapsychological research.

## WHAT MAKES THE PARANORMAL PARANORMAL? - CONCEIVING OF NORMALITY

When dealing with paranormal experiences, some issues of the theory of knowledge must be considered, particularly questions about how reality is organized and structured and how sense or meaning are constituted in the social world. These are very special phenomenological and sociological questions and they address the ways in which our thinking, acting and communication are influenced by historical and cultural factors.

The phenomenological point of view, represented by Edmund Husserl, Alfred Schütz and later by Berger & Luckmann, assumes that the person's "life world" ("Lebenswelt") determines the way of everyday experience, thinking and acting.[7] That means that sense, meaning and understanding are not constituted in individually conscious processes but in a social and cultural stock of knowledge. That "stock of knowledge" helps us to understand our perceptions, actions and experiences and give them meaning. In this way we have learned how our world and our everyday life is organized, in particular *what is normal and what isn't.* The way people conceive of normality is based on common sense knowledge and not least on their "faith" in the general validity of normality.

But the reality of the world of everyday life is not as robust as it seems and is also vulnerable to threats and crisis. This occurs if we experience something that cannot be explained because its meaning is totally unclear or is inconsistent. But if an experience cannot be explained meaningfully then the situation itself is questioned and this seems to bring us to the frontiers of what is normal. If no available interpretation scheme fits, then the only other "natural" explanation seems to be that it is "unnatural". For instance, in the little story quoted at the beginning the existence of a spirit was assumed when no natural explanation could be found for a man vanishing in a mysterious way.

Necessarily, there is a classic pattern in all these situations: In order to remove the conflict of the "senselessness" or contradictoriness of such an experience with the everyday "life world", its special status must be moved into a non-everyday "life world" status, i.e., using symbolic or transcendental interpretation schemes located in the world of magic, religion or even in the supernatural arena. The result is that experiencers have *the subjective impression that their perception went beyond the realm of possibility.*

In summary, one can say that – at the level of *subjective experience* – paranormal experiences can be considered as experiences which seem to contradict accepted knowledge or common sense about how normality functions. Thus our second research question results which looks into how one conceives the borders of normality. Our research interests were broadened to the question of whether and how paranormal frontiers are capable of being integrated (or disintegrated) into the realms of possibility. Or in other words, *which phenomena are conceivable and which are not, which belong to the area of normality and which do not.*[8]

## RECONSTRUCTION OF STRUCTURES, CONTENT AND "VERBALIZATION" THE IMPORTANCE OF NATURAL DATA

As already mentioned, statistics don't say anything about the special form of paranormal experiencing. If we look at spontaneous case reports we discover a wide spectrum of such experiences. On the one hand there is a relatively common structure, but on the other hand they have many individual features. Additionally, frequencies do not explain why and in what respect such experiences are different from

[7] For basic assumptions of the sociology of knowledge see BERGER, P. & LUCKMANN, T. (1967) and SCHÜTZ, A. (1971).

[8] In order to be able to answer this question, one must not have made a prejudgment on experiences or belief in such phenomena. (Questions about a person's faith are particularly problematic in general).

conventional experiences. From a phenomenological point of view paranormal experiences are not clear and well-defined phenomena. In most cases the experiences have undergone an interpretation process over a long time. Not only does the personal memory have an influence on this process but so too does the "use" of our social knowledge (e.g. the public acceptance of such phenomena).

Our aim is to reconstruct these individual and social processes of "experience construction" to answer the question *of whether and in which manner the interpretation of the experience as unusual takes place.*

Naturally there is a difference between the experience itself and the report of it. It is important to remember that the experiences are not straightforwardly "pictured" in the spontaneous case reports. The reports themselves contain structural and symbolical characteristics and the stories are expressions of a specific *symbolic communication.* Additionally, they are *authentic expressions* of the variety of human experience. Their "superiority" results from fact that they are people's natural first hand impressions and reflections based on lived experiences and not on scientists' theoretical conceptions or on an artificial laboratory setting.

## THE DEVELOPMENT OF THE RESEARCH DESIGN

We shall now turn to the empirical side and talk about the methodology and the practicability of its successful implementation.

The survey was to be representative for Germany. This involved a special methodical challenge. Using a random sample of 1500 people, only a standardized questionnaire could be used. With this on its own, only the incidence and distribution of the types of experience could be surveyed and not their actual content and characteristics, and thus not their subjective or individual aspects.

Therefore a research design had to be developed which incorporated both: the quantitative determination of the incidence and distribution of the types of experiences and the qualitative determination of their actual content, structure and characteristics. We solved this problem using a split method which both separates and joins quantitative and qualitative questions.

The first part of the study consists of a representative survey using a standardized questionnaire. As described above the questionnaire incorporates questions about how people conceive certain phenomena in general, questions about people's personal experiences and some sociodemographic items. Individuals who answer "yes" to having had at least one experience are asked at the end of the interview to participate again in the study at a later time to report these experiences. People who accept are asked for their address and telephone number.

The second part of the study consists of qualitative interviews with a sample of the people who agreed to additional questioning after the first part of the study. The aim is to record reports of individual experiences. The reports form the basis for a reconstruction, for example of their content, narrative structure, interpretation and explanation. Here the interest doesn't lie in collecting representative data but in recording the multitude of subjective experiences. The selection of participants is based on content. Points of reference for selecting participants are on one hand the findings from the analysis of the data from the questionnaire. On the other hand there will be a procedural method of theoretical sampling. This means that an ongoing analysis of the experiential reports itself contributes towards further selection.

This kind of approach thereby distinguishes itself from other studies in this field of research which have either used only standardized categories or have only collected reports. Our research design establishes a methodical bridging between the quantitative and the qualitative paradigm. It doesn't play the two approaches against each other but joins their strengths in a synergetic way.

## THE STANDARDIZED QUESTIONNAIRE AND FORM OF QUESTIONING

*Selection of the sample*

For several practical and methodological reasons it was decided to conduct the poll by means of computer assisted telephone interview (CATI) in co-operation with a professional opinion research institute (Academic Data located in Essen). Such an institute conducts centralized telephone surveys and has the technical means to draw representative samples. In our case the population underlying the random sample was a machine-readable list of all private German phone numbers. As approx. 15-20 % of all telephone customers abstain from a registration in a telephone directory, the so-called RDL-procedure ("Randomized-Last-Digit") was applied in order to avoid bias. With this special procedure telephone numbers are also generated by chance altering the last digit of existing phone numbers. Proceeding like that, missing cases are avoided.

A further procedure applied in order to guarantee a random selection of the interviewees consists in the "Last-Birthday"-method. In order to avoid an inadequate preponderance of female participants in the sample the interview is not necessarily conducted with the person who answers the phone but with the person in the called household who last had a birthday. It has been shown that in a household women tend to pick up the phone. Further restrictions consist in the age (only persons who are eighteen years and older are considered) and in their mastery of the German language (i.e. foreigners are included in the sample on condition that they speak German). In order to reach as high a participation as possible call-backs are arranged.

Academic Data is a small institute with twelve workstations from which qualified interviewing personnel conducts the survey assisted by computer. Only women are employed as they are actually perceived as more sympathetic. The interviews are conducted from four o'clock in the afternoon until eight o'clock in the evening, but not on Monday, Saturday and Sunday. These arrangements are based on many years of practical experience.

Finally it must be stressed that representativity exists only in an ideal world. In spontaneous case research numbers and percentages are approximate figures. So the aim should be a reconstruction of reality in its general expression and not to decimal places.

*The Computer Assisted Telephone Interview*

Some advantages of the CATI as a survey technique should be mentioned.

The interviewer works interactively with a program which controls all the administrative tasks as well as the actual interview. The telephone numbers are provided automatically. Thus the interviewer cannot fake interviews.

Through computerization this type of survey is the fastest and most cost effective way of making large amounts of data available and administrable. The pilot survey with around 200 people questioned took only two days. The main survey with around 1500 hundred interviews took only three weeks. Centralization enables quality control by supervision. We were able to follow the pilot survey on the premises and to make sure the survey was conducted correctly. Minor adjustments were made straight away.

Contrary to what might be assumed the anonymity of the telephone didn't pose any disadvantage. Moreover a concentrated form of the interview can be noticed. The person questioned always has the ability to terminate the interview without consequence, but it turns out that hardly any calls are broken off once the questioning has started. Most of all we were quickly able to determine that the readiness of giving

out address details for later questioning was surprisingly high. The success of the survey with its innovative approach depends especially on the latter.

*The questionnaire*

In the following we will discuss the structure of the standardized questionnaire and how it is restricted and operationalized.

Before constructing any questionnaire one has to decide which interview technique to use. It makes a difference whether one uses a written or oral form and whether the interview is conducted by telephone or face-to-face. We decided on computer assisted telephone interviewing (CATI). Such a method requires an enormous effort both in technical and human resources. For these reasons the professional opinion research institute Academic Data located in Essen, Germany was commissioned with the task.

A questionnaire for an interview by telephone requires that the interviewee should be able to answer all the questions in very little time. In other words the questionnaire has got to be brief. The questions have to be short, easily understandable to everyone and clearly phrased. Technical terms such as "telepathy" or "psychokinesis" which either won't be understood by the general public or might have different meanings in everyday language should not be used. Furthermore it should be taken into consideration that the telephone is a particularly anonymous medium. This necessitates a subtle approach for a sensitive subject such as parapsychology and requires a neutral approach for the average person.

On the basis of these reflections a questionnaire was developed which takes approximately eight to ten minutes to be answered and has following stringent structure (Appendix B):

(I) The questionnaire starts with a neutral question, asking if one is prepared to participate in a study of the "Freiburger Institut für Grenzgebiete der Psychologie" and to answer a few questions. To avoid selective refusal, the subject of the study is not mentioned at this point. The name of the institute implicates only that the subject has to do with psychology. In this case the word "Psychohygiene" is not mentioned to avoid associations with counseling and the like. The introduction sounds like this:

> "Hello, my name is (name of person interviewing). I'm calling you on behalf of Academic Data. We are an opinion research institute and are conducting a country-wide poll on behalf of the Freiburger Institut der Grenzgebiete der Psychologie. Would you be prepared to answer a few questions?"

(II) If the answer is "yes" six items about the conceivability of certain exceptional situations follow. Here the introduction and two examples are given:

> "In the public, especially on television and in newspapers, there are sometimes reports of strange occurrences like thought transference, prophecies, clairvoyance and the like. We would like to know if you could imagine that the following examples actually exist. Please answer following statements with either 'yes' or 'no'".

The first example is:

> "Can you conceive that people can perceive thoughts or emotions from other people over large distances?"

Second example:

> "Can you conceive that people can move or bend objects with mental powers?"

and so on.

Further items are "precognition", "psi at the time of death and danger", "psi with animals" and "UFOs".

(III) With the same question-answer pattern we continue with 9 items that ask for personal experiences. Here are two examples.

First example:

"Have you ever experienced or seen something in a dream which afterwards actually happened, but of which you could have had no prior knowledge, or which you could not have guessed?"

Second example:

"Have you ever experienced any strange occurrences just at the same time someone else died or had an accident elsewhere?"

Further items are "déjà-vu", "apparitions", "striking coincidences", "haunting", "psi with animals", "UFO-sightings" and "miscellaneous".

(IV) Following there are some sociodemographic questions such as age, education, marital status, confession and individual religious sentiment. For people who had no personal experiences the interview ends here.

(V) People with at least one personal experience are asked at the end of the interview if they would participate again in an interview at a later time to describe their actual experience. If the answer is "yes", the address and telephone number is taken.

The interview ends at this point.

*Operationalization and restriction*

Two points in the construction of a questionnaire are of particular importance: The operationalization and the question of limiting.

The aspect of the operationalization is best explained with an example, namely with the item "psi experiences at the time of death or danger" mentioned before. The question was:

"Have you ever experienced any strange occurrences just at the same time someone else died or had an accident elsewhere?"

As we already pointed out the common characteristic of psychic experiences lies in its structure: they are experiences which are structurally placed on the boundary of what society perceives as normality.

In our example the structure consists of an unexpected coincidence in time between the moment of death and an external occurrence which was somehow seen as being associated with the former. An interpretation is left open. It can range from pure chance to a spiritualist assumption. In the operationalization the aim was not to ask for a definite interpretation or content but for a description of the varying structure.

Also in limiting the types of experiences it was not the aim to include for completeness sake any number of contents. Most important was the theoretical assumption that the perception of normality is blurred and that the conceptual boundaries of conceiving are wavering. The task was to embrace with a condensed number of selected items (in our case six) as far as possible the whole spectrum of what is conceivable. The first results suggest that our theoretical reflections were right (figure 1):

Not all, but a great number of people can conceive that one could feel when a person close to them dies. But only a few could conceive people influencing objects with mental powers or could conceive that the existence of UFOs was possible. Precognition and the perception of thoughts and emotions from other people over a distance lie somewhere in the middle. Similarly it is also conceivable for 57 % of the sample that animals can perceive a danger their owners are facing somewhere else.

In collecting personal experiences there was also a balance between compressing and unfolding a wide spectrum (figure 2):

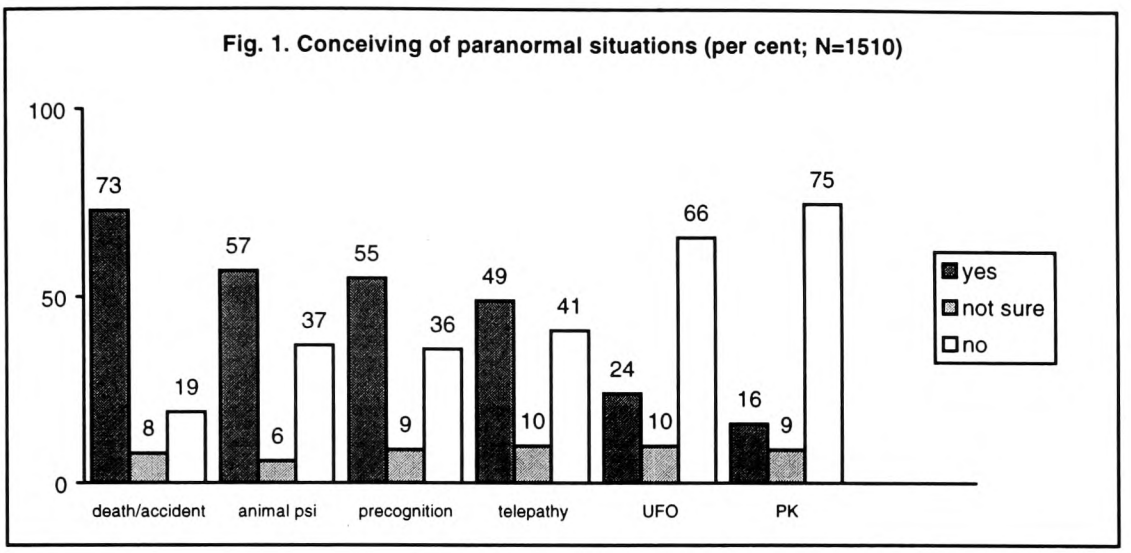
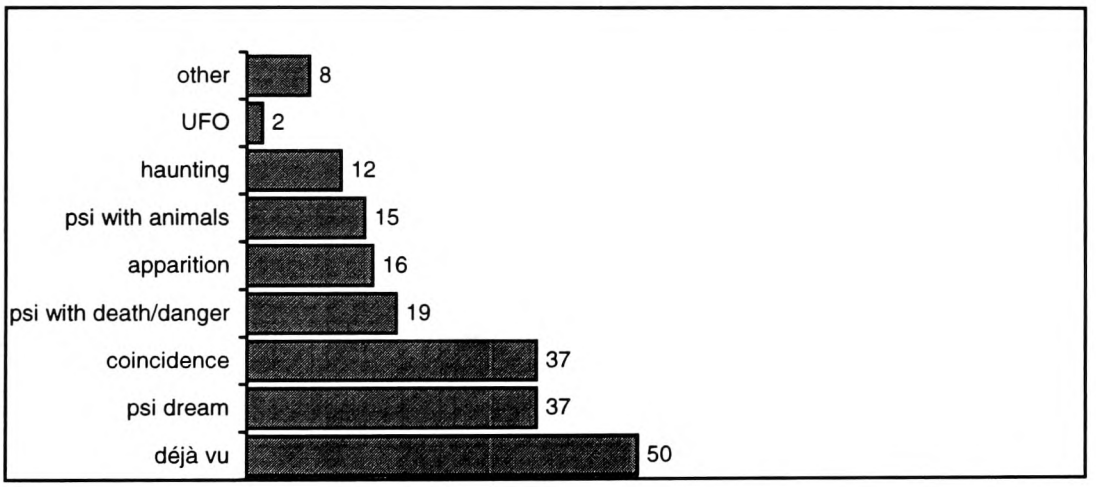



Figure 2




First it should be pointed out that in these diagrams we are dealing only with statistical rates and not with

the description of contents or with subjective interpretations. We should also point out that these data are hot from the press and thus without any far-reaching interpretation.

As expected the "déjà-vu" had with 50 % the most positive responses. Many positive responses were given for the items "ESP-dreams" and "striking coincidences", fewer for the items "apparition", "psi with animals", "psi with death and danger" and "haunting". The category "UFO-sightings" is located on the far fringe of what can be experienced.

## THE SECOND PART: ADDITIONAL QUALITATIVE INTERVIEWS

In the main study 75 % of the sample had at least one personal experience. From these people nearly half agreed to a later questioning and gave their address details. This is really a lot.

The aim of the second part of our study is to continue with open interviews where the experiencer gives a report about his or her unusual experiences. Up to this point we only know by a simple "yes" *if* there was anything. In the qualitative part our interest is now directed toward the concrete experiences or events behind the items in the standardized questionnaire. What underlies the responses given in the first questionnaire? What was experienced concretely? How do people report their experiences? Which topics, content or motives occur? How do experiencers interpret and explain their experiences? And how do they integrate their unusual experiences into the everyday "life world"?

Finally the qualitative analysis of the interviews will reconstruct the following dimensions:

- Content of the experiences
- Their narrative structure
- Subjective evidence for the experiencer
- Interpretations and explanations of the experiencer
- Importance for the experiencer and coping strategies.

The methodological procedure looks as if those giving their agreement and addresses in the first interview will be called a second time. But, unlike the standardized section of our investigation, these qualitative interviews are conducted by ourselves.

The aim of the second interview does not involve using a catalogue of questions at all. Moreover the participants are asked to report on their experiences as naturally, freely and as unstructuredly as possible. It would be unsuitable for researchers to lead participants with their own questions if we are interested in reconstructing the subjective meanings and structures in reports of individual paranormal experiences.

On the other hand there are, of course, some structuring items during the interview. This concerns mainly the beginning of the conversation where the researcher briefly describes the purpose of the interview. And because of the large temporal distance between the first and second interview, we have to repeat the questions from the standardized questionnaire so that a certain structure and arrangement are present. (On the other hand and in addition, we can also check the items from the questionnaire.)

It must still be stressed that in this part of the investigation representativeness plays a subordinate role. The aim is not to emphasize statistical relations, but to analyze the individual reports and their content. Nevertheless one can assume that the results reconstructed from single cases meet quite well the requirement to describe typical cases (but not in a statistical sense). So it is not necessary to contact or interview all 500 addresses available. Rather we make a particular (i.e. content-led) selection, oriented to the following criteria: the profile of the interviewee concerning what he or she could conceive and his or her unusual experiences (e.g., number and kind of paranormal experiences), sex, age, denomination and subjective religiosity, origin and region in the sense of possible differences between East and West Germany, other sociodemographical variables (e.g., marital status, education, occupation etc).

Additionally we want to take advantage of the large number of people agreeing to further questioning by extending the second investigation part to one which includes asking for written reports. This enlarges not only the sample size, but at the same time enables a possible further comparison between verbal and written case reports.

Even if no results can be presented at the current time, the qualitative part has already furnished very positive results. This is, it has revealed a high readiness for participation, problem-free agreement to record the conversation on tape, as well as the interview situation.

## CONCLUSION

We assume that these positive results are related to the concerted action of at least three factors:

- a neutral, non psychologizing concept
- a suitable language for operationalization
- the ease of the telephone for the interviewee

The result confirms in any case that the attempt to combine the strength of the quantitative paradigm with the qualitative one is a very promising approach.

We would like to close with a general reflection. In this lecture there was talk of frontiers and restrictions, but also of challenges, synergy and maximization. Scientific endeavor towards truth is always a balance between wish and renunciation, which is probably true for all elementary aspects of life. The scientist will always encounter boundaries. As Max Dessoir (1889, 342) formulated it in his famous essay "Parapsychology" – and we quote:

"What man is and what he should do he never learns from rigid terms, never to the last word, but only from the living development of his being." The scientific occupation with natural data can help us sharpen our sense again and again for the living in its never ending multitude.

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# PSYCHOLOGICAL CHARACTERISTICS OF CHILDREN WHO SPEAK OF A PREVIOUS LIFE: THE ROLE OF DISSOCIATION

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## ABSTRACT

Personality and mental ability measures were administered to 27 pairs of children in Sri Lanka who do, or do not, claim memories of a previous life. Questionnaires about their behavior, development, and family environment were administered to their parents. Children claiming previous-life memories perform better in school than their peers and they are not more suggestible. The Child Behavior Checklist reveals that they exhibit more behavioral problems, including oppositional traits, and obsessional and perfectionistic characteristics. The Child Dissociation Checklist shows them to have dissociative tendencies (e. g., rapid changes in personality and frequent daydreaming). The structure of their family environment does not differ from that of other children.

## INTRODUCTION

Children can occasionally be found who claim to remember events from a previous life, or make statements that are interpreted as referring to memories of a previous life. These children make statements about their presumed previous life, such as where they lived, about the events leading to their death (mostly accidents), and other circumstances in life. Most of these cases are found in Asia where belief in reincarnation is widespread.

Stevenson (1977, 1987) has investigated numerous such cases and found them in most parts of the world. The primary aim of his investigations has been to test the veridicality of the statements that the children have made: In some cases, particularly in Thailand, Burma, India, Sri Lanka, Turkey and Lebanon, Stevenson has found a fairly close correspondence between the child's statements and events in the life of a specific, deceased person. Other investigators have reported similar findings (Haraldsson 1991, 2000a, 2000b; Keil, 1991; Mills, 1989; Mills, et al., 1994; Pasricha, 1990).

Why do these young children start to speak of images and ideas allegedly of a previous life in much the same way they speak of other, more pedestrian, memories? The concept of reincarnation is the traditional explanation in the countries where most of the cases are found. It assumes that the claimed memories are reflections of real events that happened before the child was born, and were preserved by the consciousness of the child who is now reborn. It has also been suggested that these claims might be déjà-,vu-related experiences (Haraldsson 1991). Anthropologists have expounded the explanation of a cultural interpretation of the child's statements by the parents in terms of a previous life etiology, which the child is then taught to accept (Mills, 1989).

Psychological explanations have also been advanced to explain alleged previous life memories: Social isolation, undue suggestibility, a rich fantasy life, dissociative tendencies, attention-seeking, and disturbed relationships with parents. Any of these might lead a child to claim previous life memories (Brody, 1979; Haraldsson, 1991). The Coupling of a rich fantasy life with dissociative tendencies seems to be particularly likely to produce such "memories".

Sri Lanka is a multi-ethnic society, primarily Buddhist but with sizeable Hindu, Muslim, and Christian communities. Cases of children speaking of a previous life have been found in all communities but mostly among the Buddhists. Some of the psychological explanations were put to test in a study conducted in Sri Lanka which also assessed the cognitive abilities of 30 such children, aged 7 to 13 (Haraldsson, 1995, 1997). At the time of the assessment, most of the children were no longer speaking about their previous life memories. Most children stop that around the age of 5 or soon thereafter and it is unusual for them to continue beyond 8 years of age. These children were found not to confabulate more than other children nor were they more suggestible. In other respects there were considerable differences. They had a more developed vocabulary and obtained higher scores on a brief test of intelligence. Their recent memory and their school performance excelled that of their peers. They proved to be a group of quite able children. However, they also had a problematic side to their lives: They were more argumentative, nervous and higher-strung, perfectionistic, more concerned with being neat and orderly, and they liked to be alone.

After this first study, some interesting questions remained unanswered. Do these children dissociate more than other children? Do they live in particularly conflict-ridden families? Are the families structured differently in their internal organization and in the control that is exercised over family members? Or, do the families allow a greater degree of autonomy and independence for their members?

The concept of dissociation has been used to describe a variety of psychological processes ranging from those perfectly normal, like divided attention and daydreaming, to the appearance of multiple personalities in the same person with limited or no awareness of each other (Cardena, 1994). Dissociation has often been considered a defensive reaction, but also a normal psychological trait with a close relationship to hypnotizability (Hilgard, 1986). Dissociation has a long history in psychical research and parapsychology, especially through studies involving mediumship, automatisms, and hypnosis. It has been seen as psi-conducive and as associated with strong psi-effects.

Why is dissociation of potential relevance in the study of children who speak of memories of a previous life? We have already mentioned the long tradition of relationships between dissociation and psi experiences of different sorts. Furthermore, in many instances in which a verification of the claims of these children is possible, they are found to be incorrect (are falsified), suggesting that they are a production of imaginary imagery rather than memory, and often the children refer, and speak about a different personal identity, namely their previous existence. It therefore seems appropriate to explore whether children claiming previous life memories have some psychological resemblance with individuals with multiple personalities, or the dissociative identity disorder, as it has been termed of late (DSM-IV, 1994). A further interesting group for comparison would be children with imaginary playmates. Search for psychological studies that compare the psychological characteristics of these three groups failed to identify a single study.

The multiple personalities group has been studied most, and is characterized by extreme dissociation (Putnam, 1994). Putnam has designed a test to measure dissociation that is primarily based on findings derived from the study of individuals displaying multiple personalities.

In this study we assess, among other variables, the strength of dissociation in children who speak of a previous life and hence indirectly explore their resemblance to persons with multiple personalities. However, it should be born in mind that the phenomenology of cases of the reincarnation type differs widely from cases of multiple personality.

## METHODS

*Subjects*

The participants were 27 pairs of children and their parents, 14 pairs of boys and 13 of girls. They ranged in age from 5 years and 5 months to 10 years and 2 months. Mean age for subjects was 7 years and almost 10 months (SD = 1 year and 5 months), and 7 years and slightly over 10 months (SD = 1 year and 5) for controls. The pairs were equated for sex, age (the control children were on the average seven days older), and general background (social and family demographics). Within each pair of children, one was the *index* subject, viz., the child who claimed to have memories of a previous life, and one was the *control* subject, viz., the child who had made no such claim. The children lived in a large area of southern and central Sri Lanka and were nearly equally located in cities or towns, and in rural areas. Two of the instruments were only administered to certain age groups:

*Psychological Instruments*

*The Peabody Picture Vocabulary Test- Revised (Dunn & Dunn, 1981).*
This is a test of the child's receptive vocabulary and word knowledge and does not require an oral response by the child. It consists of 175 words, scaled and presented in order of (increasing) difficulty. Each item is read aloud to the child and the child is then required to point to one of four black and white pictures (in a bound volume of illustrations) that goes best with the target stimulus. This and other tests were translated into Sinhalese by Vimala Mahendran. A back translation by an independent person revealed no particular problems.

*The Coloured Progressive Matrices (Raven et al., 1984).*
This instrument is an index of general intellectual capacity (i. e., g) and has been extensively used in cross-cultural applications by anthropologists, psychologists, and others. Raven (1985) has described this scale as "...theoretically-based... with roots in the investigations of Spearman into the nature of intelligence..." (p. iii) and as "... a test of clear thinking and observation..." (Raven, 1963, p. 3). The test, which is administered on a nonverbal basis, calls upon the child to use *visual pattern recognition* skills for the earlier (and easier) items and *analogical* (or eductive) reasoning on the later (and more difficult) items.

*Spatial Memory (Kaufman, 1983).*
This subtest from *The Kaufman Assessment Battery for Children* was included as a nonverbal index of memory function. According to Kaufman (1983), this task is "... designed to assess short-term recall via simultaneous, not sequential, processing... Spatial Memory measures the child's ability to recall the locations of pictures arranged randomly on a page (p. 48)."

*Verbal Memory (McCarthy, 1972).*
This task, which is from The *McCarthy Scales of Children's Abilities*, requires the child to listen to sequences of words or sentences and then to immediately recall them (much in the same fashion as traditional digit span tasks). "The entire series, then, tests the child's ability to repeat words and sentences that he hears (p. 9)."

*Verbal Memory II.* In this part of the verbal memory tasks of *The McCarthy Scales*, "... the examiner reads a simple short story to the child, who is then requested to retell the story (p. 10)." This task, in

conjunction with Part I, offers a broad inventory of the child's ability to use verbal working memory for single words, sentences and phrases, and more meaningful material (viz., a story).

*The Family Questionnaire (Fowler, 1980).*
This instrument has been developed from the work of Moos (1974) whose *Family Environment Scale (Form R)* is the source inventory. Analyses of the *FES-R* by Fowler (1980, 1981, 1982) had demonstrated that a 30-item version of the original instrument could be constructed of two orthogonal factors of 15 items each in order to measure dimensions of " Organization-control" and "Cohesion vs. Conflict." Twenty-five pairs of parents independently completed the FQ.

*The Child Behavior Checklist- Parent Form (Achenbach & Edelbrock, 1983).*
Twenty-five pairs of subjects' mothers completed the *CBCL.* The CBCL surveys the social competence, behavioral development, and adjustment of children and has been extensively studied in North American populations of children from preschool age through upper adolescence. In the previous administration (Haraldsson, 1995, 1997) responses to several items called for further explorations. Hence a few questions were added, such as if subjects argued about their previous-life memories, if their fears were related to previous-life memories, etc.

*The Gudjonsson Suggestibility Scale (Gudjonsson, 1984, 1987).*
This instrument was administered to children 8 years and older (15 pairs) in order to assess the children´s "... responses to 'leading questions' and 'negative feedback' instructions..." after being asked to recall a short story which had been read aloud. After recall of this fictitious narrative, the children were asked 20 questions (Gudjonsson, 1987) about the content of the story, 15 of which are suggestive or 'leading' in some way. After this procedure, each of the children was informed that a number of errors in recall had been made and, for this reason, it would be necessary to re-administer the questions once more. From the GSS several indices are obtained: The accuracy of Free recall; Confabulations, i. e., content that is 'recalled', but not actually present in the narrative; Yield suggestibility, i. e., the number of items yielded to before negative feedback is given; Shift suggestibility, i. e., the distinct change in the nature of the child's answer to the 15 'suggestible' (or leading) questions and the 5 'non-suggestible' ones; and Total suggestibility which equals Yield + Shift.

*The Child Dissociation Checklist (Putnam & Helmers, 1993).*
This inventory is a 20-item survey of dissociative experiences in childhood that is completed by one of the parents, usually the mother. Validation studies of this new scale (e. g., Putnam & Helmers, 1993; Putnam & Peterson, 1994) indicate adequate reliability and validity for children aged 3-19: The scale is capable of discriminating "... between children diagnosed as having Multiple Personality Disorder and Dissociative Disorder Not Otherwise Specified...(p.204)".

*School Records.*
School performance was examined by reviewing each child's school record book. For children 10 years and older, the grades and marks received and the relative standing of the child in his/her class is recorded in the school record book. For younger children, position in class is obtained by getting the grades for all of the children in the class and calculating each child's position. Grades given to 5 and 6 year olds do not allow a meaningful differentiation of school performance.

*Procedure*

Each subject was visited unannounced at his or her home or school. In schools, teachers helped us find a control child whose birthday was closest in its class to that of our index subject. If we met the index child at home, we searched for a control subject from the neighborhood who was as close in age as possible. We expressed our appreciation by small gifts (like ballpoint pens or small calculators) after the testing session was over.

## RESULTS

*Cognitive Status.* Table 1 displays the results of comparisons between children claiming previous-life memories (index subjects) and control subjects for a number of indices related to the children's cognitive development, behavioral adjustment, and personality characteristics. These and other comparisons were made using the Wilcoxon matched-pairs signed-rank test. On *Raven's Coloured Progressive Matrices*, and some other cognitive indices, there is no statistically reliable difference between the index subjects and the controls. These results suggest, overall, that these children's cognitive capacity, memory functions, and related aspects of cognitive development are at a near parity with each other.

There are *trends*, however, in favor of the index subjects for the *Peabody Picture Vocabulary Test-Revised,* the *Memory* index from the *GSS,* and the *Words and Sentences* subtest of the *McCarthy Scales.* In contrast to these trends, however, no differences are seen in the results for the *Spatial Memory* subtest of *The Kaufman Assessment Battery for Children.* Any differences, then, between index and control subjects appear to be limited to trends in vocabulary development and a specific type of immediate recall function for auditory working memory. Cognitive development, at this juncture, appears to be broadly comparable for the two groups of children. These findings are hence somewhat at variance with those reported earlier by Haraldsson (1995, 1997).

A clearer contrast between these children is seen, though, when their position or *rank-in-class* is considered: Index children are typically more advanced in their school performance. They have a higher average position: Their mean rank-in-class percentile is 86. When this is compared to a theoretical mean of 50, a Wilcoxon Z of 2.60 results ($n = 11$, $p < .01$). This is in line with the senior author's earlier finding (Haraldsson, 1997). Because of the young age overall of this sample, we only have school ranks for 11 of these index children.

A mean percentile of 61 for the controls indicates, however, that our control sample may not be as random as we would like. See later discussion of this problem. Sometimes parents did not want us to contact the child's school, or the school was closed for holidays, and we had to get a control child from the neighborhood or among the child's friends. On a few occasions, we noticed, these friends were also outstanding pupils.

*Behavioral and Personality Development.* Table 1 also presents the results of several contrasts between our index and control subjects on measures of behavioral development and adjustment (e. g., *The Child Behavior Checklist*), dissociation and suggestibility, and family environment. On the *Total Behavior Problems* score from the *CBCL*, index children were consistently viewed by their parents as demonstrating more behavioral and adjustment problems. In Table 2, it is clear that these children present quite unique challenges to their parents: They are viewed as being more argumentative, tenser, higher-strung, more anxious and fearful, as well as having a number of obsessional and perfectionistic traits (e. g., needs to be more orderly and neat).

Table 1

MEANS +/- SD OF VARIOUS PSYCHOLOGICAL MEASURES[A] AND RESULTS OF WILCOXON MATCHED-PAIRS SIGNED RANKS TEST COMPARING 27 CHILDREN CLAIMING PREVIOUS-LIFE MEMORIES AND 27 CONTROL CHILDREN.

| | Subjects (N=27[b]) | | Controls (N=27[b]) | | |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Wilcoxon (Z) |
| Peabody Pictures Vocabulary Test | 89,15 | 27,41 | 81,59 | 22,02 | 1,57 |
| Raven Coloured Progressive Matrices[C] | 16,92 | 7,17 | 16,08 | 3,75 | ,32 |
| Kaufmann Assessment Battery for Children Spatial Memory McCarthy Scales | 9,44 | 3,19 | 9,85 | 3,93 | -,74 |
| Words and sentences | 25,07 | 3,94 | 23,11 | 4,43 | 1,82 |
| Story | 5,81 | 3,19 | 5,26 | 2,78 | ,70 |
| Gudjonsson Suggestibility Scale[d] | | | | | |
| Memory | 11,73 | 6,66 | 9,33 | 4,53 | 1,23 |
| Confabulations | ,93 | ,96 | 1,67 | 1,40 | -1,52 |
| Conf % of total response | 11,00 | 13,00 | 18,00 | 17,00 | -1,45 |
| Yield suggestibility | 5,73 | 3,31 | 5,73 | 2,37 | ,04 |
| Child Behavior Checklist[e] | | | | | |
| Problemscore | 34,08 | 17,48 | 18,14 | 11,4 | 3,57** |
| Family Questionnaire[f] | | | | | |
| Abs. cohesion diff. | 3,81 | 2,40 | 3,58 | 2,44 | ,36 |
| Abs. control diff. | 4,12 | 3,02 | 3,35 | 2,33 | 1,24 |
| Child Dissociation Checklist | 6,59 | 5,44 | 1,69 | 2,19 | 3,80** |

[a]Raw scores were used as none of these tests have been standardized for Sri Lankan children.

[b]In a few instances, *N* is lower due to missing data.

Two tailed statistical significance: *P<.05; **P<.01

[c]n = 12

[d]n = 15

[e]n = 24

Table 2
INDIVIDUAL ITEMS OF THE CBCL, PARENT'S FORM. [1]

| CBCL Item | Description | Mean score Subject (N=24) | Control (N=25) | Wilcoxon Z |
|---|---|---|---|---|
| 3 | Argues a lot | 1.04 | 0.21 | 3.24** |
| 9 | Certain thoughts, obsessions | 0.63 | 0.00 | 2.88** |
| 7 | Bragging, boasting | 0.96 | 0.36 | 2.84** |
| 32 | Feels s/he has to be perfect | 1.04 | 0.54 | 2.80** |
| 29 | Fears animals, situations or places | 1.00 | 0.44 | 2.54* |
| 45 | Nervous, high strung or tense | 0.35 | 0.00 | 2.53* |
| 87 | Sudden changes in mood or feeling | 0.58 | 0.04 | 2.49* |
| 47 | Nightmares | 0.33 | 0.08 | 2.45* |
| 24 | Doesn't eat well | 0.75 | 0.24 | 2.44* |
| 99 | Too concerned with neatness or cleanliness | 1.67 | 0.60 | 2.44* |
| 17 | Daydreams or gets lost in thought | 0.58 | 0.08 | 2.43* |
| 93 | Talks too much | 0.46 | 0.04 | 2.43* |
| 69 | Secretive, keeps things to self | 0.58 | 0.12 | 2.39* |
| 95 | Temper tantrums or hot temper | 1.00 | 0.56 | 2.39* |
| 71 | Self conscious or easily embarrassed | 0.88 | 0.40 | 2.36* |
| 13 | Confused or seems to be in a fog | 0.50 | 0.04 | 2.25* |
| 103 | Unhappy, sad or depressed | 0.21 | 0.00 | 2.24* |
| 12 | Complains of loneliness | 0.46 | 0.08 | 2.16* |
| 50 | Too fearful or anxious | 0.71 | 0.24 | 2.16* |
| 36 | Gets hurt a lot, accident prone | 0.83 | 0.40 | 2.15* |
| 77 | Sleeps more than most children | 0.46 | 0.08 | 2.12* |
| 97 | Threatens people | 0.67 | 0.28 | 2.07* |
| 86 | Stubborn, sullen or irritable | 0.92 | 0.48 | 2.06* |
| SUM | | 35.53 | 18.47 | 3.82** |

*$p<.05$ **$p<.01$, two tailed.

[1]The groups differed significantly on the listed items. The $z$-values of the Wilcoxon matched-pairs signed ranks test are given, and mean raw scores for subjects and controls.

Yet other traits appear to reliably differentiate them from the control subjects, including, but not limited to, possible disturbances in peer relationships and isolative behaviors (e. g., being secretive and lonely). However, the CBCL also shows that index children have no fewer close friends than the controls, nor do they do things with them any less often. They also, according to their parents, get along with their brothers and sisters, other children, and their parents, in no different way than control children do according to their parents.

TABLE 3
INDIVIDUAL ITEMS OF THE CDC. [1]

| CDC item | Brief item description | Mean score Subject (N=27) | Control (N=27) | Wilcoxon Z |
|---|---|---|---|---|
| 3 | Shows rapid changes in personality | 0.78 | 0.04 | 3.40** |
| 2 | Daydreams frequently | 0.78 | 0.15 | 2.88** |
| 16 | Has intense outbursts of anger | 0.48 | 0.07 | 2.49* |
| 10 | Refers to him/herself in third person | 0.37 | 0.00 | 2.33* |
| 12 | Acts sexually too old for his/her age | 0.41 | 0.04 | 2.33* |
| 10A | Claims that things s/he did actually happened to another person | 0.33 | 0.00 | 2.25* |
| 20 | Has or shows two or more personalities | 0.23 | 0.00 | 2.12* |
| 1 | Denies or forgets known painful experiences | 0.37 | 0.07 | 1.90 |
| 19 | Frequently talks to him/herself | 0.18 | 0.00 | 1.89 |
| 15 | Has vivid imaginary companion/s | 0.11 | 0.00 | 1.73 |
| 18 | Has unusual nighttime experiences | 0.22 | 0.07 | 1.63 |
| 6 | Shows variations in skills | 0.15 | 0.00 | 1.63 |
| 11 | Has rapidly changing physical complaints | 0.41 | 0.15 | 1.59 |
| 5 | Poor sense of time | 0.78 | 0.04 | 1.52 |
| 4 | Unusually forgetful or confused about some things | 0.15 | 0.04 | 1.13 |
| 14 | Reports hearing voices talking to him/her | 0.11 | 0.04 | 1.00 |
| 9 | Continues to deny or lie, even when the evidence is obvious | 0.48 | 0.33 | 0.97 |
| 7 | Rapid regression | 0.41 | 0.30 | 0.81 |
| 8 | Difficulties in learning from experience | 0.37 | 0.26 | 0.69 |
| 13 | Suffers from unexplained injuries | 0.07 | 0.04 | 0.45 |
| 17 | Frequent sleepwalking | 0.07 | 0.04 | 0.45 |
| SUM | | 6.59 | 1.67 | 3.80** |

*$p<.05$ **$p<.01$, two tailed.

[1]The $z$-values of the Wilcoxon matched-pairs signed ranks test are given, and mean raw scores for subjects and controls.

The parents of our target group view their children as talking too much. In 22% of cases their talk concerned their alleged previous life. They also were argumentative, but only in 4 cases did they argue about their previous life. They also are more fearful and anxious than other children. In 30% of cases did their fears relate to events (usually fatal) that they claimed to remember. The parents' reports confirm several key differences between index and control subjects that Haraldsson (1997) had discovered earlier.

Further light on how the index children may differ from their peers is given in the results for the *Child Dissociation Checklist* and the *GSS* in Tables 1 and 3. On the *CDC*, parents of the index children significantly differentiate their children from parents of control subjects, that suggests some greater degree of affective instability and fantasy proneness (e. g., daydreaming) among their own children. This affective instability is revealed in such things as 'rapid changes' in mood and personality, more frequent display of temper tantrums, and, perhaps, psychosexual precocity (probably experimentation and curiosity about sexual matters). Moreover, there is a strong Spearman rho correlation between the scores of the CBCL and the CDC: .84 ($n = 24$, $p < .001$) for the index subjects and .76 ($n = 22$, $p < .001$) for the controls. The results of the *GSS* do not reveal any greater tendency or disposition for the index children to be more suggestible or to confabulate when given such material as a brief narrative to recall.

In regard to behavioral and personality development, there are some quite important differences between our index children and the controls, including their school performance, and how their parents view their behavioral adjustment and personality development.

*Family Environment.* The results of the *Family Questionnaire* (Fowler, 1980) are displayed in Table 1. This analysis examines *absolute differences* between mothers and fathers on the *FQ* with respect to both indices, viz., *Organization-control* and *Cohesion vs. Conflict.* No overall differences are seen in these results for the parents of index and control subjects. There is, apparently, no greater recognized need on the part of these two groups of parents to structure, control, or otherwise limit the activity of family members. In turn, the perceptions of mothers and fathers do not differ between our index and control subjects with respect the second index, viz., the *open* expression of conflict.

## Discussion

This second study of children who claim previous-life memories has yielded a particularly interesting finding, viz., the Child Dissociation Checklist reveals that they exhibit a high degree of dissociation, according to their parents. They show rapid changes in personality, daydream frequently, have intense outbursts of anger, often refer to themselves in the third person, etc. (see Table 3).

Children who report previous-life memories, are often characterized by unusual behavioral features in line with the personality that they claim to have been in the previous life, such as monk-like behavior of children who say they have been monks (Haraldsson & Samararatne, 1999). Some of these behavioral features may fade away as they become older. They also speak of tragic events which may find expression as phobias or fears, or, in rare cases, they may point to birthmarks which they claim that stem from fatal wounds inflicted in the previous life (Stevenson, 1997). The rapid changes in personality that their parents report, may be related to these particular behavioral features, but that requires further study, also that they often refer to themselves in the third person, which may then be the assumed previous personality, which they have sometimes given a name.

At the time of testing most of the children in our sample reported no previous life memories, as at the age of five to six most of them are no longer speaking of their earlier memories. There was no correlation

between dissociation score and age (range is short) for either the target children ($r_s$= .10, n = 27, n.s.) or the controls ($r_s$ = .04).

In the first study we found no support for hypotheses of social isolation, suggestibility, rich fantasy life, or undue attention-seeking, but some evidence of compromised relationships with parents. Now, dissociation has emerged as a substantial factor, while the overall structure of the family environment plays no readily discernible role.

In the behavioral area, this study confirms an earlier finding of a high problem score on the Child Behavior Checklist, indicating oppositional traits, and obsessional and perfectionistic characteristics. These children are particularly argumentative, obsessed with some thoughts, bragging, feel they have to be perfect, are fearful and nervous and changeable in mood, just to mention some important characteristics contained in the CBCL (see Table 2).

The data of the first psychological study showed that children claiming previous-life memories have a larger vocabulary, better memory, and are as a group doing much better in school than their peers. Their better performance in school is confirmed by the present results, but no significant advantage is seen for these children in their vocabulary development or memory skills. However, we find trends in the same direction for vocabulary development and some memory functions, while no such trends are seen for other memory functions (see Table 1).

These differences between the two studies on measures of cognitive status may well be due to the high rank-in-class mean percentile of 61 in the present sample's control subjects, against 49 in the first study, which is, as it should be, close to the theoretical mean of 50. The high percentile of the controls may indicate a biased sample. It may push up cognitive status scores for the controls and may thus reduce differences of mental abilities between the two groups.

Dissociation by itself is not always, of course, pathological (Lewis, 1996, p. 304). Indeed, some aspects of dissociation are a common expression of the child's evolving ability to use fantasy creatively, subserving the development of their imaginative capacities, as well as being able to use dissociation as a means of defense (against, for example, perceived-threats in interpersonal relationships). However, Lewis (1996) reminds us that "... dissociation functions as an automatic, primitive, protective, psychological defense against excruciating physical and mental pain...(p. 303)." Putnam (1996), in turn, has emphasized that the reality of dissociation is "... a discernible failure in the integration of information, experience, and perception... (p. 286). The question then arises whether or not the behavioral phenotype that is reflected in the present findings has yet other linkages to such aspects of personality development as identity formation, imaginative capacity, the use of fantasy and the normative occurrence of dissociation. These linkages may perhaps occur by means of defenses and other intrapsychic mechanisms (e. g., neurocognitive abilities).

There is another phenomena in preschool children that has some resemblance to claims of memories of a previous life and which are not uncommon in western societies. Some children report imaginary companions or playmates which in some cultures may be referred to as invisible playmates (Manosevitz et al., 1977; Taylor et al., 1993). In such cases the child seems to create images of external companions (one or more) with which the child plays, gives names and treats as real beings and expects others to do the same. These cases may have the appearance of a continuum, from full-blown external companions to pretense and play. The onset of imaginary companions and previous-life memories is around the same age but the question whether their duration is similar needs further investigation. A comparative psychological study of children with imaginary companions and children with previous-life memories would indicate if there is a common or different origin to both phenomena.

The conclusion is that children with previous life memories have strong dissociative tendencies. This may explain why they come up with alleged previous life memories. There are however serious problems with this interpretation. Dissociative tendencies, along with rich fantasy life, may explain alleged memories (imagery interpreted as memories?), but it cannot explain correspondences that may be found between birthmarks (which start to form in the embryo) and wounds inflicted at death of the alleged previous personality. Besides, how do we then explain the high correspondences found in the best cases, between these statements of the child about the previous life and verified facts in the life of some identified deceased person? Can they be considered a fluke of chance in view of the many unsolved or poorly solved cases?

There may also be an alternative explanation. Children who speak of a previous life sometimes display a syndrome of characteristics; namely, not only claimed memories, but frequently phobias associated with the previous life, birthmarks and even traces of skills or knowledge. Could it be that added to these characteristics are traces of a previous personality? According to this alternative explanation, this personality or traces thereof, may at times become active and this might explain the rapid changes in personality reported by the parents, and the display of more than one personality.

Our findings are from Sri Lanka. Do they hold in other cultures and countries? This will be the subject of our next study.

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# SURREALISM AND PARAPSYCHOLOGY: AN EXPERIMENTAL APPROACH

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## ABSTRACT

Is there a relationship between Surrealism and Parapsychology? The term "Parapsychology" was coined in 1889 by the German Psychologist Max Dessoir, and thirty-five years later the French poet and the thinker André Breton gave a definition of "Surrealism". The first serious parapsychological experiments and studies were published at the end of the 19th century by Frederic Myers, Pierre Janet, Théodore Flournoy, Charles Richet, at about the same time as Freud's Psychoanalysis and the discovery of the Unconscious. These discoveries had an important impact on Surrealism.

As early as 1916 Breton, assistant-doctor in the Neuro-Psychiatric Center at Saint-Dizier, came into contact with Freud's theories and other principal works in Dynamic Psychiatry which were to provide his theoretical bases. His fascination with Freud inspired him to apply Psychoanalytic methods to his patients suffering from war-trauma: he made notes in order to interpret their dreams, dissociations and involuntary thoughts.

There was another important coincidence in 1919: the publication of André Breton and Philippe Soupault's joint experiment in automatic writing in Les champs magnétiques and the Psychophysiologist Charles Richet's foundation of the Institut Métapsychique International (IMI) in Paris.

The aim of the presentation will be to show the close parallels that obtained between Parapsychology and Surrealism in Paris of the 20s, and also to illlustrate how they both used similar experimental methods to explore paranormal phenomena such as premonitions, extraordinary experiences, telepathy and dreams.

## INTRODUCTION

In 1924 André Breton presented his definition of 'Surrealism' in the Surrealist Manifesto like a dictionary entry. He wrote: "Surrealism, noun, masc., pure psychic automatism here intended as the expression of the true function of thought either verbally or in writing. Thought dictated in the absence of any rational control and without any aesthetic or moral preoccupation.

Based on a belief in the superior reality of certain forms of free associations, the power of dreams and the non-intentional play of thought, surrealism attempts to destroy all other psychic mecanisms and to substitute them with the unconscious in order to resolve the principal problems of life. Aragon, Baron, Boiffard, Breton, Carrive, Crevel, Delteil, Desnos, Éluard, Gérard, Limbour, Malkine, Morise, Naville, Noll, Péret, Picon, Soupault, Vitrac. "Although the surrealist movement began in 1919 with the publication of Les Champs magnétiques (The Magnetic Fields) by Breton and Soupault, it was onlyin 1924, at the end of the period of the exploration of psychic automatisms (automatic writing, sleep, dreams), that Breton gave a definition of the term 'Surrealism'. But what kind of definition did he give? One is perhaps surprised not to find anything about its historical development or its different periods. For Breton 'Surrealism' was not a movement but a 'pure psychic automatism'. Thus surrealism was a state of consciousness, an artistic theory, an application of literature and philosophy with an experimental background. On reading this definition attentively one can find from the very beginning a lot of references to names from 'Dynamic Psychiatry' (Henry F. Ellenberger). A first connection is to Pierre Janet's automatisme psychologique (Psychological Automatism, Alcan, 1889), from which the term 'automatisme psychique' is derived. The use of the word 'psychique' instead of 'psychologique' might point to a relationship to psychical research ('métapsychique'1: Le Traité de Métapsychique of Charles Richet, Alcan, 1922) at this time. It is even possible that Breton's 'psychic automatism' is a contraction of the titles of the works of Janet and Richet. As regards the 'power of

dreams' and 'free association' we have here references to Sigmund Freud and Alfred Maury (Le sommeil et les rêves, Alcan, 1861). Maury was a French dream researcher in the 19th century before Freud. All these works have an experimental message.

If Freud, Maury, Janet, Flournoy, Myers and Richet's impact on surrealism could be proved, the surrealist experiments might merely be explained by historical old-fashioned experimental methods and topics. Didn't the 1920s have any influence?

The aim of this paper will be to show the close parallels between parapsychology and surrealism in Paris of the 20s and how they used similar experimental methods to explore paranormal phenomena like premonitions, extraordinary experiences, telepathy and dreams. In the following parapsychological and surrealist experiments in the period between 1919 and 1929 will be compared and contrasted. The question to answer is: Who influenced whom? Was there a mutual contact? What was the intention behind these experiments? Before answering these questions it will be necessary to present some historical facts to explain Breton and Cie's experimental interest.

## 1. Some Important Historical Facts about the Origins of Surrealism before 1919

After finishing school in 1913 André Breton (1896-1966), who was later to become the leader of thesurrealist movement, began to study physics, chemistry and biology and then medicine. At the same time he entered in correspondance with the famous French intellectual and writer Paul Valéry (1875-1947) to whom Breton sent his first poems and still later his essays in the 1920s. After 1913 Breton followed two directions: the natural sciences and literature.

In February 1915, at the age of 19, Breton was mobilized in war and had to give up studying medicine.

At first Breton served at Pontivy/Bretagne where he discovered the French poet Arthur Rimbaud (1854-1891) before staying in Nantes for almost a year. At Nantes he worked as a medical assistant treating patients of war.

One of his patients was Jacques Vaché born, like Breton, in 1896. They became friends and spent a lot of time together reading modern French poets like Lautréamont (1846-1870), Apollinaire, Baudelaire, Rimbaud and Mallarmé and their own writings. In May 1916 Breton was sent to the psychiatric centre of Saint-Dizier to Doctor Raoul Leroy where he discovered the main proponents of dynamic psychiatry and excerpts of Freud's work in the library. At this time no complete work of Freud's had been translated into French. Nevertheless Breton was so fascinated with Freud that he treated his patients using psychoanalytic methods: he made notes in order to interpret their dreams, dissociations and involuntary thoughts. At Saint-Dizier Breton got the theoretical and practical basis for practicing automatic writing which was to came later on in the surrealist movement.

In January 1917 Breton was transferred to Paris to the military psychiatric clinic Val de Grâce, where he met Louis Aragon, a medical assistant like himself who was also very interested in literature. Here they read modern poets to each other, treated war traumatized patients together and gained experience in psychiatry. Val de Grâce - a laboratory of automatic writing?

## 2. The Year 1919: Surrealist Automatic Writing and the Institute

*Méta-Psychique International (IMI)*

After the loss of Vaché and publishing the first number of Littérature in March 1919, Breton intended to experiment with automatic writing. At the end of April he began to write Les Champs magnétiques (The Magnetic Fields) with Philippe Soupault in the café "La Source" in Paris. They spent between eight and ten hours a day here; it was a really intensive joint-experiment. They wrote texts on their own, in alternation, read the results to each other and practiced writing dialogues. At that time 'automatic writing', which was experimentally studied at the end of the 19th century, was no longer new. But Breton declared the application of 'automatic writing' to literature as a new and important discovery. (A very good analyses of these texts' manuscripts is found in Marguerite Bonnet in: André Breton's Œuvres Complètes I, Bibliothèque de la Pléiade, Éditions Gallimard, Pages 1121-1172.)

1919 was also the year that Jean Meyer, Charles Richet, Henri Bergson and Cie founded the Institut Métapsychique International (IMI). This institute was dedicated to all kind of psychical research. A coincidence? A direct reaction to some young intellectuals? Perhaps not. Because of the circumstances of World War I with a perceptible increase in spiritistic activities, groups and paranormal phenomena these researchers could have seen the urgency to examine and to analyse those phenomena. In order to conduct serious research the experiments used the experimental standards of mainstream-research at that time. One year later the first number appeared of the Revue Métapsychique, the official "Bulletin de l'Institut Métapsychique".

The experiments presented in this journal will form the basis for a later comparison with the surrealistic experiments.

## 3. Four Surrealistic Experiments – Chronology and Description

*a) Automatic Writing*

In 1919, on the date of the discovery of 'automatic writing', 'automatic writing' was systematically applied to poetry for the first time. Les Champs magnétiques, written by Breton and Soupault, was founded on the theoretical basis of Dynamic Psychiatry at the end of the 19th century. Thus, it was ist application that was new and not its theoretical basis. In the Surrealist Manifesto (Manifestes du Surréalisme, Éditions Jean-Jacques Pauvert, pp. 41-42) Breton presented the conditions for 'automatic writing' in his chapter on 'Secrets of Surrealistic magical art'. Here is a short resume: For him it was important to find a place where one's spirit has the ability to concentrate on ist own; to have a pencil and something to write on; to find a maximally passive and receptive position; to abstract one's own intellectual abilities and any other abilities; to write quickly without any prepared topic; the first sentence should come on its own; not to think about punctuation, this might interrupt the process of writing.

The aim of this application was to enlarge human consciousness and to demonstrate that Automatic writing could have a prophetic and therapeutic character. Indeed, exploring Automatic Writing consequently provided some possibly interesting premonitions. In the "automatic" drama S'il vous plaît (1920), written by Breton and Soupault, the authors announced the possibility of a fire in a department-store in the city. One year later a fire destroyed "les grands magasins de la Ménagère", the large department-stores of the "Ménagère". Another putative premonition was given in 1923 by Breton himself in his poem

"Tournesol". Fourteen years later, in 1937, he pretended in L'Amour fou (chapter four) that he met a woman. It turned out that he later met his second wife, Jacqueline Lamba, in the same circumstances he had described in this automatic text. In 1925 he correctly predicted the date of the beginning of World War II in his Lettre aux voyantes (Letter to clairvoyants).

Telepathy appeared to be evident during his joint experiments with Soupault in Les Champs magnétiques, with the two of them noting obvious linguistic parallels.

*b) Hypnotic Sleep - "Entrée des médiums" (1922/23)*

Being occupied with dadaist-activities between 1920 and 1922, Breton published for the first time in November 1922 a text called "Entrée des médiums" which was about the 1919 experiment in automatic writing. In September 1922 Breton met René Crevel who told him that in 1921 he had had a spiritistic initiation by a clairvoyant. Breton was immediately interested in Crevel's story and invited him to repeat that experiment On 25th September 1922 the first séance in Breton's atelier in the rue Fontaine took place. The participants were Max Morise (1900-1973), Simone and André Breton, René Crevel and Robert Desnos (1900-1945). Breton asked Crevel to be the leader for this night. They turned off the lights. They sat around a table and took their neighbours' hands. A short moment later Crevel went under auto-hypnosis into a trance and began to cry. Than Crevel told a story about a woman who murdered her husband, a murder by the husband's demand. Then Breton woke him up and Crevel wasn't able to remember anything. After this experiment Breton wanted to know if it was possible to repeat it with other participants. After Crevel had left the room, Desnos began to scratch the table and demonstrated mediumistic abilities too. During a hypnotic sleep Desnos spoke, wrote and made drawings. The next time a competition between these two participants could be observed.

These séances took place regularly up to February 1923. During that time the séances, which had the aim of provoking altered states of consciousness or telepathic messages but not of entering in contact with dead persons or God, became more and more dangerous. One evening a group of people in a trance left the room who wanted to hang themselves on a portmanteau. Another evening, whilst in a state of trance, Desnos threathened Paul Éluard with a knife. After this event Breton, who didn't have any ability of mediumistic sleep and who had the function of controlling and taking records, decided to give up these sessions.

Not only is it interesting that these experiments took place but also that they were observed and recorded, this itself demonstrating that Breton took a scientific interest in them. This scientific interest was also repeated in his contact with Nadja where he wrote a journal filled with his own observations.

*c) Experiments with Dreams (between 1922 and 1929)4*

The first dream texts by surrealists were published by Breton in the journal Littérature, nouvelle série no. 1, on 1st March 1922, a period in which Breton was still occupied with the dream-theories of Freud. In this context Breton's dreams appeared as the result of that preoccupation. But a very important period of surrealistic dreams began at the end of 1924 with the initiation of the journal La Révolution surréaliste where one can find a lot of different dream texts and which ended with Breton's Second Manifesto.

There are three different types of dreams:

1. "rêve pur": the night-dream, the basis of all the others; here it was important for Breton to write down his dreams directly after waking up without any aesthetic preoccupation; after having published his dreams, Breton asked that other surrealists should record and tell their dreams too. It was the beginning of group-analyses and interpretation.

2. "rêve éveillé": day-dreams; dreaming with the eyes open; the surrealists, walking along the streets of Paris, often dreamt and perceived another reality in this way and they subsequently exchanged their experiences about this;

3. "rêve dirigé": a method, based on manipulation of, for example, erotic desires in dreams; this was applied regularly by the surrealists.

They shared their dreams with each other and analyzed them together in groups with the method of free association. The result was to see the dream as a collective phenomenon. Benjamin Péret declared in 1925: "Nous sommes ici pour rêver en commun." ("We are here to dream together.") This kind of collectivity was responsible for the dream getting a more and more political dimension. With the French word "rêve"/dream, the first syllable of the word "révolution" was thematized.

*d) Games (since 1925)*

Starting in 1925, the surrealists began to experiment in groups with normally well known games, only changing their rules in order to explore phenomena like telepathy, synchronicity, chance and making analogies. Three different types of games were distinguished:

1. Word- and speech-games: for example, "Cadavre exquis verbal" from 1925, "Questions and answers" from 1928 and "If-Clauses" from 1929.
   The rules of all these games required that the game-partners shouldn't know anything about the creative results of the others. Here the surrealists often noticed that the results were remarkably meaningful. "Cadavre exquis verbal" worked in the following way: A group of five people sits around a table with a sheet of paper. The first writes a noun, the second an adjective, the third a verb, the fourth a noun and the last one finally a participle. The participants have to hide what they have written. The first result of this surrealistic game was the sentence: "Le cadavre exquis boira le vin nouveau". Here is a very nice example of a result during a seminar at the University at Freiburg, where we tried to play this game: "Le grand vent bleu chante le matin enchanté".
2. Games with the task of drawing common hidden pictures: "Cadavre exquis dessiné" from 1925, "Chapeaux surréalistes" from 1940/41,"Dessin Successif", "Jeu de l'Oie" (1929).
   After the process of drawing the surrealists analyzed them together.
3. Games of cards: "Tarot" (since 1925). "Jeu de Marseille" (1940/41), a very esoteric game where the traditional symbols and colors were transformed into hermetical symbols.

*4) Experimental Research at the IMI between 1920 and 1930*

In 1919, the year of the foundation of the IMI, the 3rd edition of F.W.H. Myers' main work, Human personality and its survival in bodily death, appeared in the French language from the principal publisher of medical books, Felix Alcan, in a third edition. Another important book for the history of parapsychology appeared from the same publisher in 1919 in a ninth edition: L'Automatisme psychologique by Pierre Janet. Thus, there are two examples of books in psychical research that were publicly discussed. In memoriam of Breton's death Philippe Soupault wrote in 1967 that in 1919 they had read Janet's work to each other whilst preparing Les Champs magnétiques 6. Breton himself, never directly referred to his knowledge of Janet's work.

The first issue of the journal Revue Métapsychique was published in October 1920. In the second issue one could read a memorial article to the life and work of Théodore Flournoy who had died in 1920. In December 1921, after the publication of the eighth issue, the main studies of the last fourteen months had concentrated on classical psychical topics such as "materialisation", experiments on mediumship, some texts on spiritism and some articles about typical paranormal phenomena like premonition, telepathy and levitation, but there was nothing about 'automatic writing', 'dreams' or 'games'.

René Sudre, one of the most important collaborators of the journal published in the issues 5 (May-Juin) and 6 (July-August of 1921), as well as in issue 2 of the year 1922, three continuous articles about Albert Einstein's theory of relativity and its relationship to psychical research. This fact is interesting because at

exactly the same time (from the end of 1920 to July of 1921) Breton wrote some comments in his private journal about the importance of Einstein's theory of relativity and of surrealism and psychoanalysis for the 20th century. Thus, we can see here how a crucial topic was received.

In 1921, in the eighth issue of the Revue Métapsychique, an article appeared with the title "Observation d'un Cas de Médiumnité intellectuelle" written by Professor Rocco Santoliquido about a conference that took place in March 1921 at the IMI. It was a resume of his experiments between 1906 and 1909 for a first period, and for a second period about sessions between August 1916 and July 1917 with the medium Louise who communicated remarkable messages about Santoliquido's future. Not only is this aspect and the results interesting for the comparison to follow, but also the methods of exploration, the dialogues between Louise and Santoliquido, for here we can find once more a similar "Question/Answer-Procedure" to that in Breton's text "Entrée des médiums". Here are some examples:

*1. Professor Santoliquido:*
5 Septembre 1916:

Question: "Merci de votre magnifique réponse. Permettez encore une question: vous savez que l'idéal de ma vie est l'étude approfondie des questions psychiques. Je voudrais, par cette étude, dans la seule limite de mes forces et de mes moyens, apporter quelques lumières à l'humanité. Comptons sur votre aide, je vous supplie de me donner des conseils ou des indications sur ce que je dois faire et sur ce que je ferai (études théoriques, expériences, enquêtes etc.)."

Réponse: "Cher, je pense que, pour le moment, il faut un travail de préparation, d'observation digilante, et de patientes recherches.
"Cher, courage et foi! Je t'aiderai dans tes méditations. Tâche d'entendre ma voix!
"Cher, je ne peux pas parler longuement: la médiumnité est une chose délicate.
"Cher, je vous bénis."

*2. André Breton with Robert Desnos, September, 25th of 1922:*

Question: Que voyez-vous?

Réponse: La mort.
Il dessine une femme pendue au bord d'un chemin.
Écrit: près de la fougère s'en vont deux (le reste se perd sur la table).
Je (Breton) pose à ce moment la main sur sa main gauche.

Q. - Desnos, c'est Breton qui est là. Dis, ce que tu vois pour lui.

R. - L'équateur (il dessine un cercle et un diamètre horizental).

Q. - Est-ce un voyage que Breton doit faire?...

R. - Oui.

With these examples I only want to show that the work with mediums at the IMI was not so very different from the hypnotic sleep sessions of the surrealists, even if the length and the quantity of questions and answers in one session weren't similar. But the aim was the same: to get information about events in the future. Another observation is interesting: the importance of recording and transcribing their dialogues. Here the psychical researchers have a visible influence on Surrealism.

In 1922, perhaps the decisive period for the coming together of surrealism and psychical research in Paris, there was a large public discussion about the experimental works at the IMI in comparison to the

experiments which took place at the Sorbonne. In the journal of July/August Dr. Geley (he died in 1924), chief-editor of the Revue Métapsychique, gave an overview of the negative results at the Sorbonne during fifteen séances of ectoplasm with the medium Eva C. and the subsequent polemic about positive and negative results concerning the existence of the phenomenon of ectoplasm between the IMI and the Sorbonne. If there was at first a fruitful exchange between scientists with different backgrounds, the print media made a constructive dialogue impossible. Their motto: "Puisqu'ils n'ont rien vu, c'est qu'il n'y a jamais rien." Over the next few months the controversy reached a climax with mutual accusations. The representatives of the IMI accused the Sorbonnards of not having created a sympathic and creative enough ambiance for the experiments, the Sorbonnards accused the IMI of fraud and trickery. In that public controversy the media were on the side of the Sorbonne-professors. In the September/October-issue Dr. Geley wrote an article where he gave an overview of "une campagne d'injures et de mensonges" against the IMI including experiments with the non-professional medium Franek Kluski. What had happened here? Kluski, who had been at the IMI to participate in mediumistic experiments, refused to repeat them at the Sorbonne. The result: the experimenters at the Sorbonne charged Kluski with trickery and the IMI with non-professional methods of control. Both the campaign and the "bad" publicity that followed in the printed media were irritating for the Institute. These examples show that the psychic experiments at the IMI were very hotly discussed by the public. One sure hypothesis is that the surrealists, always interested in public affairs and anomalous research, knew about them.

Another event seemed to be important for a comparison of surrealism and parapsychology: The publication of Charles Richet's Traité de Métapsychique on February 13th, 1922. This book presented a systematic review of experimental psychical research. One important topic of the study was a critical commentary on 'automatic writing'. Was it an attack on the surrealists when he said of automatic writers: "On dirait des poètes qui ne connaissent pas la poésie; des philosophes qui ne connaissent pas la philosophie; des prêtres qui ne connaissent pas la religion." ("One could say poets who don't know poetry; philosophers who don't know philosophy; preachers who don't know religion.")

On 1st November, 1922, Breton published for the first time a resume of his 1919 automatic writing experiment (L'Entrée des Médiums). Why that? Did he have to defend its application to poetry? Did he want to give an indirect reaction to Charles Richet? In his Manifesto of 1924, as we have seen at the beginning, there are different definitional levels of Surrealism, a basic definition of the term and a philosophical one. Why did he give a philosophical definition?

But there are even other parallels: In 1924, in issue 2 (March-April) of the Revue Métapsychique, the first example of a precognitive dream appeared, at the beginning of 1925 two other dreams followed. Other ones appeared in 1927. At the end of 1924 the main 'dream'-period of the surrealists began.

Between 1924 and 1926 articles were regularly published on 'automatic writing'. Was there a direct reaction to Breton's Manifesto? Between 1927 and 1929 three articles were published about games in the Revue Métapsychique:

in 1927 a study with the title 'Cartomancie et Métagnomie',

in 1928: 'Nouvelles études sur la prémonition dans les jeux du hasard' and finally

in 1929 an article about a book by the author C. de Vesme 'Le merveilleux dans les Jeux du Hasard'. Now comparing these articles with the Surrealists' occupation with games, one can remark that there is once again a coincidence in time. The most important surrealist games were played between 1925 and 1930.

*5) Commentary*

Do we have enough material to establish a relationship between surrealism and psychical research in Paris in the 20s? Even if the parallels presented here are obvious, it is impossible by this way of comparison to

identify any clear impact of surrealism on psychical research and vice versa. One can see that the experiments of the IMI with mediums closely parallel the surrealists' experiments with hypnotic sleep, dreams and games: they had the same methods of observation and control, in some cases the same execution and the activation of similar psychic automatisms with comparable results regarding the existence of paranormal phenomena. If the interest of the IMI was to demonstrate the existence of psychic phenomena and to find explanations for them, the interest of the Surrealists was to enlarge their artistic abilities. They wanted to show that it was possible to create remarkable works in poetry and art by applying the methods of psychical research. The only problem today is that in the standard works of psychical research and surrealism no direct mutual references can be found. In the period between 1920 and 1930 the surrealists never wrote or spoke about a possible influence of psychical research on their movement. In the Revue Métapsychique there is no indication of any reception or occupation with surrealist works and events. Even later surrealist statements concerning this topic were still rare. This lack of mutual occupation is an impossibility if we consider both their public roles at that time.

In 1933 in his essay 'Le message automatique' Breton discussed Frederic Myers. In 1952, in his Entretiens avec André Parinaud he referred to names like Charles Richet, Théodore Flournoy and, again, Frederic Myers. Two years later Breton was in correspondence with the editor of the Revue Métapsychique in 1954, Robert Amadou. At that time he participated in conferences about Alchemy by René Alleau at the Sorbonne. These examples demonstrate that Breton knew about the most important parapsychological works. But when did he know about them? In 1916? Later? Is it really impossible to believe that there existed a mutual knowledge and impact in the 20s?

To get an answer to these questions, it might be helpful to search for information in archives of the Bibliothèque Nationale in Paris and the archives of the IMI. With these investigations it would perhaps be possible to demonstrate a direct mutual impact in respect of their experiments and topics and to contribute to an important question that is hotly discussed in literature about surrealism. To show a direct influence of parapsychology within surrealism might represent a new explanation of the theoretical background behind surrealist phenomena between 1919 and 1930.

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# CONJURING SPIRITS OR CONJURING TRICKS? EXPLANATIONS FOR SEANCE PHENOMENA IN VICTORIAN BRITAIN[1]

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## ABSTRACT

Social historians of Victorian Britain have paid little attention to reported Spiritualist phenomena. Yet such phenomena, particularly those associated with Daniel Home, challenged both scientific and religious views, and attempts to explain how they were produced occupied both the minds of his contemporaries and a significant amount of column space in the periodical press. So far as the latter is representative of the former, most contemporaries regarded Home as a trickster, and supported this view by claiming that conjurors could explain the details. Conjurors, however, do not appear to have known what was going on. Their failure to explain, no doubt along with the general rise of scientific authority, led to the discourse increasingly becoming a scientific one, yet mainstream science provided no additional clues. Though many contemporaries no doubt would have accepted the broad accusation of trickery against Home, anyone comparing the available explanations with the available evidence would have become increasingly aware of the gap between the two. Those who had attended Home's seances were certainly aware of this gap, as were Spiritualists more generally. In terms of understanding Victorian Spiritualist beliefs, this is important. While these have tended to be seen as part of a broader response to the so-called Victorian 'crises of faith', Victorian Spiritualists repeatedly stressed that they had become convinced by the evidence. As nobody else seems to have been able to provide an adequate alternative explanation, perhaps it is time more credit was given to the reasons they themselves gave for their beliefs. The wider discourse about Home's phenomena suggests an overwhelming rejection of supernatural agency, despite no adequate natural explanation being available. The response of mainstream scientists - to question the scientific competence of those who had tested Home, and to argue that what they reported had not in fact happened - supports a Kuhnian view of science. The views of the periodical press (which included false accusations) suggest that the threat posed by Home's phenomena may be viewed in more general sociological terms, such as Bauman's view of modernity as a war against ambivalence.

## INTRODUCTION

Within mainstream British history, Victorian Spiritualism has been seen in the context of the broader response to the theological issues that provoked the so-called 'crises of faith', and functional aspects of the movement in terms of class or gender.[2] Very little attention has been paid by historians, however, to the phenomena reported, despite the fact that these are what Spiritualists endlessly appealed to themselves as the primary reason for their beliefs. This is particularly unfortunate as the phenomena were also of more general interest to Victorians. The phenomena reported challenged both scientific and religious views, and were discussed regularly in contemporary periodicals. By far the most famous (and most impressive) medium of the period was Daniel Home, whose phenomena were most commonly attributed by non-Spiritualists to trickery. This paper describes contemporary attempts to attribute Home's phenomena to trickery, and considers how one might understand these attempts within a broader social context.

[1] I would like to acknowledge my debt to the following organisations, all of which provided funding for the project of which this paper is a part: the Institut fur Grenzgebiete der Psychologie und Psychohygiene, Frieburg; the Koestler Chair, University of Edinburgh; and the Society for Psychical Research, London.

[2] Oppenheim, 1985; Barrow, 1986; Owen, 1989.

## EXPLANATIONS FOR HOME'S PHENOMENA IN THE PERIODICAL PRESS

Shortly after Home arrived in Britain in 1855, Lord Brougham attended one of his seances. With him went David Brewster, author of *Letters on Natural Magic*, as Brewster later explained, "to assist in finding out the trick". Following the seance, Brewster wrote a letter to his sister in which he stated that, though he did not believe the phenomena to be the result of spirits, he could not conjecture as to how they were produced.[3] In October of that year, however, the *Morning Advertiser* included a statement suggesting David Brewster and Lord Brougham were Spiritualists, and this prompted Brewster to write to the paper to reject the charge. In doing so, he suggested that the phenomena - which had included raps, the movement of a table, and the ringing and movement of a bell without any apparent contact - "could all be produced by human hands and feet". In a second letter, he suggested the success of the deception relied upon the table having been covered with "copious drapery, beneath which nobody was allowed to look". Brewster's accusation of imposture provoked others present at the seance to challenge his recollection of events, and remind him that he had been invited to look under the table, that he had in fact looked under the table, and that he had admitted he was still unable to explain the phenomena. The inadequacy of his conjectures was further suggested by another account of Home's phenomena which appeared in the *Advertiser*, and which described additional phenomena, ruled out trickery as an explanation, and warned readers not to be impressed by Brewster's scientific credentials in such matters.

It seems clear that Brewster was unable to explain the phenomena and, as such a position would no doubt have been embarrassing for the author of *Letters on Natural Magic*, it is not surprising he came up with some conjectures, as he put it, "for the information of the public". While Brewster's conjectures were cited by some sceptics in the following years,[4] their shortcomings must have been obvious to many readers, and his apparent dishonesty made Brewster a target of Spiritualists for many years to come. Home left Britain shortly before the controversy in the *Advertiser*, and though he received occasional mention in the press, British Spiritualism generally declined in popularity during the late 1850's. In 1860, however, public attention was again directed towards Spiritualism in general, and Home in particular, when the *Cornhill Magazine* published an account of one of his seances.

An anonymous article (subsequently attributed to Irish writer, Robert Bell) appeared in an early issue of the *Cornhill Magazine*.[5] The article described a seance in which, among other things, Home had levitated up to the ceiling and made a mark there. While the author of the article had described a room in darkness, he had no doubts that Home had really levitated, and stressed that these were facts that could not be ignored, however unlikely they might seem. Given the large readership of the Cornhill[6], it is almost certain that this would have been the best-known account of any seance at the time, and several periodicals responded by attributing events to trickery.[7] Yet little was offered by way of explanation, and the main response was a general assurance that conjurors could do equally wonderful things, and without the aid of darkness.[8] With the publication of Home's biography, *Incidents in my Life* (1863), public attention was

[3] Gordon, 1870, 257-8; Home, 1863, 237-61.
[4] *Fraser's Magazine*, 71, 1865, 41-2; Maskelyne, 1876, chapter IV.
[5] *Cornhill Magazine*, 2, 1860, 211-24.
[6] Circulation is estimated to have been 80,000 at this time (Ellegard, 1958, 372).
[7] *Blackwood's Edinburgh Magazine*, 87, 1860, 381-95; *Literary Gazette*, 1860, Sep. 8, 180-1; *All The Year Round*,, 1860, July 28, 370-4; *Fraser's Magazine*, 66, 1862, 521-22; *Punch*, 1860, Aug 18, 63.
[8] *Punch*, 1860, Aug 25, 73; *News of the World* cited in *Spiritual Magzine*, 1, 1860, 438; *Fraser's Magazine*, 66, 1862, 521.

again drawn to accounts of Home's phenomena. Yet those that reviewed Home's biography failed to shed additional light on his methods, with the dominant themes being darkness and the superiority of conjurors.[9]

The argument that Home's phenomena relied upon darkness became increasingly challenged as his mediumship progressed. Following publication of the *Cornhill* narrative, Dr James Gully (pioneer of hydropathy and a close friend of Darwin) had written to the *Morning Star* admitting he had been present at the *Cornhill* seance, confirming what had happened, and noted that, while the room "was comparatively darkened, light streamed through the window from a distant gas-lamp outside". From that point on, a growing number of accounts of Home seances conducted in what was described as good light appeared.[10] These accounts found additional readers with the publication of *Incidents* in 1863, and with subsequent reviews of the book. By the end of his mediumship, Home's reputation as one who performed in light was regularly held up as what made him superior to other mediums, a point he stressed himself in *Lights and Shadows* (1877) when he dismissed phenomena in the dark as unconvincing.[11]

For the remainder of Home's mediumship, the conjuring theory continued to be supported, though not by any more specific explanations as to how Home did what he did. Indeed, the only other public statement by a witness in support of the conjuring theory did little more than repeat Brewster's theories.[12] As Home's mediumship increasingly challenged the notion that his phenomena were due to darkness, the argument that conjurors were capable of similar feats continued and became the most common sceptical argument, with several periodicals taking this position.[13] But how valid was this position?

## CONJURORS' FAILURE TO PROVIDE EXPLANATION

While support for the conjuring theory in the periodical press failed to provide readers with an adequate explanation for how Home did what he did, the authority of conjurors was appealed to. Those who adopted the conjuring theory had to do so on the assumption that, while they themselves did not know exactly what was going on, a competent conjuror would know. Certainly, this was the impression that conjurors gave in their performances and writings.

One way in which conjurors sought to demonstrate that Spiritualistic phenomena were fraudulent was through performance. Conjurors claimed to duplicate the phenomena produced by mediums and, though they did not necessarily explain the method employed, their assurance that nothing supernatural was going on was intended to be sufficient. However, the effects presented as demonstrations of Spiritualistic phenomena bore little resemblance to events reported in the seance room, and the methods employed relied upon apparatus and conditions that could hardly have been available to Home. Those who had attended Home's seances made this point.[14] How convincing others found such demonstrations is, of course, impossible to say.[15] However, when contemporary periodicals cited conjuring performances in support of

[9] *Quarterly Review*, 114, 1863, 179-210; *North British Review*, 39, 1863, 174-206; *The Athenaeum*, 1863:I, 351-3; *All The Year Round*, 1863, Apr 4, 135; *Cornhill Magazine*, 7, 1863, 710.
[10] *Sunday Times*, 1861, Feb 17 quoted in Home, 1863, 175-9.
[11] Home, 1877, 350.
[12] *Fraser's Magazine*, 71, 1865, 22-42.
[13] *Blackwood's Edinburgh Magazine*, 96, 1864, 16; *Blackwood's Edinburgh Magazine*, 97, 1865, 205; *British Quarterly Review*, 42, 1865, 97; *All The Year Round*, 1866, Mar 3, 184; *The Star*, 1868, May 6 quoted in *Spiritual Magazine*, 9, 1868, 255-6; *The Athenaeum*, 1871, Oct 2, 558.
[14] *Spiritual Herald*, 1, 1856, 17; Home, 1863, 75; Hall, 1884, 49; Trollope, 1887, i, 390
[15] It is worth noting that, when a former fraudulent medium published an expose of the methods he and other mediums used some years later, it noted that "[t]here is absolutely no resemblance of any kind or description, to the "seance of the "medium", in these alleged

the conjuring theory, they referred to straightforward conjuring effects more often than pseudo-Spiritualist demonstrations, and this suggests that the latter may not have been as effective as intended.[16]

The first booklet claiming to explain spiritualistic phenomena was Anderson's *The Magic of Spirit-Rapping*, which had undergone several editions prior to Home's arrival. Even Anderson's explanations for such simple effects as spirit-rapping were unnecessarily elaborate, his method involving an electromagnetic device connected to the table, and operated by a confederate in an adjacent room.[17] Elsewhere, conjurors offered suggestions about Home's methods, but they failed to give more adequate explanations.[18] Over the following years, the most famous conjurors of the day - including Bosco, Robert-Houdin and Maskelyne - expressed views on Home's phenomena, without offering any greater insight. According to the writer T. A. Trollope, Bosco "utterly scouted the idea of the possibility of such phenomena as I saw produced by Mr Home being produced by any of the resources of his art".[19] Both Spiritualists at the time and a recent biographer have claimed that Robert-Houdin was unable to explain the phenomena, though neither gives any source for their claim.[20] Nevertheless, some idea of Robert-Houdin's opinion can be gained from a book he was writing at the time of his death in 1871. In a passage referring to Home's reported ability to levitate and to make a table float in the air, Robert-Houdin noted that "[s]cience has succeeded in reproducing these surprising phenomena", citing a performance that had taken place in the Polytechnic Institute in London. This method, however, required an elaborate stage set-up with a huge glass plate mechanically-raised from below the stage. The author also referred to a method he had used himself which needed a specially-made table supported by thin wires from above the stage.[21] Robert-Houdin must have been well aware that such methods could hardly have been used in the private drawing rooms that Home visited.

Maskelyne's intention was to "thoroughly expose and explain the tricks and modus operandi of [mediums] ... and other spirit jugglers." However, he failed to explain how Home produced his phenomena, simply repeating the claims of Brewster, and some of the periodical articles referred to above.[22] In the same year, the most influential English-language conjuring book of the century appeared. In the appendix, as part of an attempt to explain the tricks of Spiritualist mediums, Hoffmann (1876) offered methods for various effects associated with Home, such as the playing of an accordion, the production of spirit hands, and the levitation to the ceiling. Yet all of them involved conditions quite different from those described by witnesses. For example, the levitation of the medium was explained by substituting in a model of the medium, which was suspended from the top of the stage by cords, and the spirit hands were attributed to

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exposes of the professional magician" (Price & Dingwall, 1922, 17). Incidentally, the book did not attempt to explain any of Home's phenomena.

[16] For example, of the following articles that made explicit comparisons between Home's phenomena and the tricks of professional conjurors, only the last referred to a pseudo-Spiritualist demonstration: *Blackwood's Edinburgh Magazine*, 88, 1860, 389; , *Fraser's Magazine*, 66, 1862, 521; *Quarterly Review*, 114, 1863, 197; *British Quarterly Review*, 42, 1865, 76-97; *Fraser's Magazine*, 71, 1865, 22.

[17] Anderson, n.d.

[18] One early text - Home, 1860 - failed to offer any additional clues, pointing out simply that the *Cornhill* levitation required complete darkness and the use of confederates.

[19] London Dialectical Society, 1873, 278.

[20] *Spiritual Magazine*, 6, 1865, 461; Burton, 1948, 103. The form of these suggest they are independent. Burton's claim is more likely a distortion of a response by Home to the allegation that he had declined to perform for Robert-Houdin (*The Star*, 1868, May 6). In this response, Home denied the allegation, and referred to "one of the most clever conjurors in France" who had attended a seance and had given "testimony that, whatever the power might be, it was not a conjuring trick" (*Spiritual Magazine*, 9, 1868, 256).

[21] Robert-Houdin, 1900, 111-18.

[22] Maskelyne, 1876, chapter IV.

stuffed gloves in phosphorous.[23] Despite their impracticality, similar methods were cited in subsequent texts.[24]

In fact, the most elaborate expose of the tricks of fraudulent mediums came the following year, written by Home himself. Part three of *Lights and Shadows* (1877), on Modern Spiritualism, was primarily an attack on fraudulent mediums that explained many of their methods while maintaining that some phenomena, such as his own, were genuine. He attributed most spirit materialisations to trickery, pointing out that when they produced such in light, he would "cease to denounce their seances as more or less cunningly-contrived vehicles of deception".[25] The worth of such a text to sceptics can be seen from the hostile reaction of many Spiritualists.[26] That it provided the most extensive explanations available for fraudulent mediums' methods can be seen by the use made of it by sceptics, who used the book as ammunition against belief in Spiritualistic phenomena generally.[27] Yet while the book explained many of the methods apparently used by fraudulent mediums, it offered no additional clues to how Home could have produced his own phenomena, a point noted at the time.[28] The result, if anything, was that Home's phenomena remained a mystery, qualitatively more impressive than that of other mediums.

So far as conjurors failed to explain what Home was doing, how can such a failure be explained? Was it that they did not know, or was it that they knew but would not say? After all, conjurors have traditionally been reluctant to reveal their secrets. Yet it is difficult to attribute the lack of explanation of Home's methods to such a reluctance. At a general level, the role of the conjuror as a debunker of the supernatural demonstrates both motivation and willingness to explain conjuring methods. More specifically, the conjuring texts cited above revealed conjuring secrets that had nothing to do with spiritual phenomena. Surely if the writers knew the methods used by Home, exposing such methods would have been preferable to explaining methods actually used by professional conjurors. On the surface at least, there seems to be no reason why conjurors would have been reluctant to explain Home's methods if they could have. That they did not strongly suggests that the most informed conjurors of the period simply did not know how Home produced his phenomena.

How many contemporaries were aware of this is obviously quite another matter. What does seem clear, however, is that those who read accounts of Home's seances were faced with accounts of phenomena for which no adequate explanation was available. The main argument being used was that conjurors were capable of such things, and this seems not to have been the case. Presumably, anyone comparing the available evidence with the available explanations would have become increasingly aware of the gap between the two. In addition, those who had witnessed the phenomena for themselves overwhelmingly (and publicly) rejected the explanations of conjurors.

## WITNESSES OVERWHELMINGLY REJECTED TRICKERY

Of the hundreds of witnesses that attended seances with Home, very few concluded his phenomena were the result of trickery, and those that did offered very little in support of their conclusions. Fanny Trollope, Robert Browning and the lesser-known writer, Elizabeth Lynn Linton, all created fictional fraudulent

[23] Hoffmann, 1876, 551-7.
[24] For example: Sachs, 1877, 387-8; Vere, 1879, 96-7.
[25] Home, 1877, 350.
[26] Spiritualists' comments included: "superficial and unsatisfactory" (*Human Nature*, 11, 1877, 204-21) and "unfair and selfish" (*Human Nature*, 11, 1877, 265-75).
[27] *Fraser's Magazine*, 15, 1877, 541-64; *The Athenaeum*, 1877, May 26, 666-7.
[28] *Fraser's Magazine*, 15, 1877, 694-706.

mediums that seem to have been based on Home, while others said nothing publicly till after Home's death.[29] In fact, during Home's mediumship, only three witnesses made public statements claiming that Home was a trickster. Brewster and the author of the *Fraser's Magazine* article cited above have already been noted. The other was the radical politician, Charles Bradlaugh, who stated simply that what he saw "might have been easily produced without extraordinary means".[30] Conversely, almost all of Home's witnesses rejected the conjuring theory, and one of the striking themes in their accounts is the confidence with which they did so. P. P. Alexander seems to have recognised the limit of his own expertise, and some witnesses described the phenomena as inexplicable without explicitly dismissing the possibility of trickery[31], but most made explicit statements to the effect that trickery did not take place. Some were convinced[32], some were certain[33], and others described trickery as impossible.[34]

Yet such firm conclusions seem to have been based on little or no knowledge of conjuring. It seems reasonable to assume that witnesses would have claimed such expertise if they could have yet, of all those who witnessed Home's seances in Britain, playwright E. L. Blanchard seems to have been the only one who claimed to have any conjuring knowledge. As he put it, he was "thoroughly acquainted with all the modes by which the acknowledged celebrities in that art practise their diverting deceptions". Blanchard had witnessed not only Home but the medium Charles Foster, and admitted, "I have never been able to detect the slightest attempt at imposition".[35] When one bears in mind that Foster was suspected of trickery within weeks of his arrival in Britain, and was subsequently caught cheating on several occasions, there would seem to be a question mark against Blanchard's level of expertise. How then did witnesses support their conclusion?

The dominant impression one gets from reading witness reports throughout Home's mediumship is that the witnesses did not conclude trickery because they did not detect any. Such apparent confidence in their ability to detect trickery present, despite no expertise in the area, was supported by stressing that they were critical observers. The importance of careful observation was stressed from the earliest seances and, throughout the period of Home's mediumship, witnesses described how they had observed carefully and regarded themselves as good observers.[36] In addition, throughout Home's mediumship, numerous witnesses stressed their critical faculties by invariably pointing out that they were not credulous, having previously been sceptical about spiritualist phenomena. As one convert insisted, "I have been *forced* to the conclusion

[29] See respectively: Neville-Sington, 1997, 350-2; Browning, 1910; Dingwall, 1947; *Journal of the Society for Psychical Research*, 4, 1889, 120-2; *Nineteenth Century*, 27, 1890, 576-81

[30] London Dialectical Society, 1873, 279.

[31] Alexander, 1871, 4; *Spiritual Magazine*, 4, 1863, 224; *Times*, 1872, Dec 26, 5.

[32] For example: *Spiritual Magazine*, 1, 1860, 233; Bell, 1860, 215; *Spiritual Magazine*, 2, 1861, 226, *Spiritual Magazine*, 2, 1861, 65; *Spiritual Magazine*, 5, 1864, 378.

[33] For example: Crosland, 1873, 23; *Spiritual Magazine*, 4, 1863, 266; *Spiritual Magazine*, 18, 1877, 554; *Journal of the Society for Psychical Research*, 4, 1889, 132.

[34] For example: Webster, 1865, 3; *Spiritual Magazine*, 12, 1871, 465; Hall, 1884, 58; *Journal of the Society for Psychical Research*, 4, 1889, 123; *Journal of the Society for Psychical Research*, 4, 1889, 127; *Journal of the Society for Psychical Research*, 4, 1889, 129; *Journal of the Society for Psychical Research*, 4, 1889, 134.

[35] *Spiritual Magazine*, 1, 1860, 412; London Dialectical Society, 1873, 134-5.

[36] *Yorkshire Spiritual Telegraph*, 3f, 1857, 2; *Spiritual Herald*, 1, 1856, 43; *Spiritual Magazine*, 2, 1861, 226; *Spiritual Magazine*, 2, 1861, 294; *Spiritual Magazine*, 4, 1863, 519; Home, 1863, 244; Webster, 1865, 6; *Medium and Daybreak*, 1, 1870, 121; Alexander, 1871, 2; Podmore, 1902, ii, 16.

that we are surrounded by intelligent beings who once existed in material bodies like our own ... I have been, in spite of a bitterly opposed state of mind, compelled to believe in Spiritualism".[37]

Witnesses also justified their rejection of trickery by describing conditions in which they felt trickery would have been detected, or that prevented trickery altogether. Witnesses stressed that the phenomena occurred in a room where conjuring apparatus were not available, usually the private home of a respectable acquaintance. The journalist Robert Bell had witnessed phenomena in "(h)ouses into which it would be impossible to introduce mechanical contrivances, to lay down electric wires, or to make preparations for the most ordinary tricks"[38], and others dismissed the idea of machinery, ropes or other apparatus in such circumstances[39], or pointed out that Home had never even been to the house before.[40] As one witness put it, he could imagine Anderson being able to duplicate some of Home's phenomena, but not in Mr Hall's drawing room.[41] A second distinction witnesses made between Home and magicians was in noting the opportunities they had to check and control for possible trickery.[42] The most common check witnesses described was that they looked under the table while phenomena such as raps or table movement occurred in order to ensure that the source of the phenomena was not concealed there[43] , and some concluded this was sufficient to rule out trickery.[44]

As sceptics had appealed to the authority of conjurors in support of their conclusions, so did witnesses. In doing so, they made similarly misleading claims. If one accepts, as Trollope claimed, that Bosco ruled out trickery, and even if one accepts the similar (though unsubstantiated) claim about Robert-Houdin, it is difficult to accept the claim by the *Spiritual Magazine* that Home had been subjected to the scrutiny of "the most accomplished professors of the 'Herr Frickell and Robert-Houdin' order - and these witnesses, with one consent, assert, not only that they have not detected any contrivances by which he could accomplish the manifestations they witnessed, but that it was impossible he could have any without their having detected them, and they accordingly affirm their belief in the ultra-mundane cause of the phenomena".[45] Not only was this stated prior to either of the above claims, but none of these conjurors had actually attended a Home seance. Indeed, the only professional magician reported to have witnessed a Home seance was a French magician, Canti, in Paris.[46] While he is reported to have dismissed trickery as an explanation, there is no evidence of any professional conjuror in Britain making such a statement.

Nevertheless, that proponents as well as sceptics looked to conjurors for support reinforced their position of authority in such matters. Since conjurors were unable to provide an explanation for sceptics, and as their shortcomings were being pointed to (and exaggerated) by witnesses, it is perhaps not surprising that the authority of conjurors became a less prominent theme in the debate as Home's mediumship

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[37] *Spiritual Magazine*, 18, 1877, 552; see also *Spiritual Magazine*, 1, 1860, 233; Home, 1863, 174; Webster, 1865, 3; *Spiritual Magazine*, 10, 1869, 368; *Spiritual Magazine*, 10, 1869, 461; London Dialectical Society, 1873, 142; London Dialectical Society, 1873, 145, London Dialectical Society, 1873, 157; Home, 1921, 87.

[38] *Cornhill Magazine*, 1, 1860, 215.

[39] Home, 1863, 75; Webster, 1865, 186-7; London Dialectical Society, 1873, 128; Alexander, 1871, 2; Zorab & Inglis, unpub'd, 26.

[40] *Spiritual Magazine*, 1, 1860, 220; *Human Nature*, 4, 1871, 138; *The Spiritualist*, 2, 1873, 137; *Journal of the Society for Psychical Research*, 4, 1889, 126; Zorab & Inglis, unpub'd, 105.

[41] Alexander, 1871, 2.

[42] For example: London Dialectical Society, 1873, 279; Alexander, 1871, 15; Medhurst & Goldney, 1964, 42.

[43] For example: *Spiritual Magazine*, 1, 1860, 2; *Spiritual Magazine*, 1, 1860, 525; *Spiritual Magazine*, 2, 1861, 431; Alexander, 1871, 12.

[44] For example: *Cornhill Magazine*, 1, 1860, 217; *Journal of the Society for Psychical Research*, 4, 1889, 129.

[45] *Spiritual Magazine*, 4, 1863, 354.

[46] *Spiritual Magazine*, 1, 1860, 485.

progressed. The stress placed by witnesses upon observation and conditions continued, however, and increasingly came to be articulated in the language of science.

## THE EMERGENCE OF SCIENTIFIC AUTHORITY

The trial of Lyon versus Home in 1868 brought out the first public statements to the effect that Home had been tested by scientists. Home read out a letter from J. Hawkins Simpson, an electrical engineer who had "carefully tested varied phenomena due to Mr Home's mediumship", and Cromwell Varley explained that he had "examined and tested [the phenomena] with Home and others, under conditions of my own choice, under a bright light, and have made the most jealous and searching scrutiny". Both had concluded the phenomena were not the result of deception. Around the same time, the physicist John Tyndall published a letter in the *Pall Mall Gazette*, claiming that Home had previously shrunk from investigation by Michael Faraday. This prompted a reply from Home and a correspondence ensued in which Tyndall's claim was severely damaged.[47] The following year, the London Dialectical Society began an investigation into Spiritualistic phenomena, in which Home was a prominent participant. The results were not published until 1871, due to disagreement between the Committee responsible and other members of the Society. However, the published report dismissed trickery as out of the question as it concluded "that motion may be produced in solid bodies without material contact, by some hitherto unrecognised force".[48] By this time, the physicist William Crookes had already carried out experiments with Home. In the *Quarterly Journal of Science* (which Crookes edited at the time), he had declared he had seen enough to make investigation worthwhile, but felt that guards against fraud and measurements were insufficient. A year later, following experiments with Home, Crookes announced the existence of a new 'psychic force'.[49] The conditions of the experiments were attested to by Serjeant Cox (who would later found the Psychological Society of Great Britain) and by the astronomer William Huggins, though the latter declined to draw conclusions from the experiments. The conclusions were supported by Cromwell Varley and Alfred Russell Wallace.

That Home's phenomena appeared to have the support of some established scientists was only the most significant development in a more general trend towards appealing to the authority of science, which is evident among both witnesses and sceptics. The stress placed by witnesses upon critical observation and conditions referred to above continued throughout the period of Home's mediumship and, from the late 1860's, such concerns increasingly came to be articulated in scientific language. In the early 1860's, some witnesses had explicitly challenged the need for strict experimental controls.[50] However, Spiritualist periodicals increasingly came to refer to seances with mediums in term of 'tests' and 'test conditions', the latter of which appears to have meant that trickery was impossible.[51] What test conditions entailed is less clear, however. One account describing test conditions with the mediums Herne and Williams referred to a dark seance in which the mediums' hands were held, their feet were tied, and plasters were placed over their mouths.[52] Nevertheless, Home's witnesses continued to use scientific language to refer to conditions in

[47] The correspondence is reproduced in *Spiritual Magzine,* 9, 1868, 254-81.
[48] London Dialectical Society, 1873, 12-13.
[49] *Quarterly Journal of Science*, 7, 1870; *Quarterly Journal of Science*, 8, 1871, 339-49, 484-92.
[50] *Spiritual Magazine*, 2, 1861, 449; *Spiritual Magazine*, 2, 1861, 8; *Spiritual Magazine*, 6, 1865, 452.
[51] *Spiritual Magazine*, 6, 1865, 259; *Spiritual Magazine*, 8, 1867, 255; *Spiritual Magazine*, 10, 1869, 46; *Spiritual Magazine,* 11, 1870, 177; *Medium and Daybreak*, 2, 1871, 106; *Medium and Daybreak,* 3, 1872, 6; *Medium and Daybreak,* 3, 1872, 362; *The Spiritualist*, 29, 1872, 15; *The Spiritualist*, 34, 1872, 47.
[52] *Medium and Daybreak,* 3, 1872, 250.

which they felt trickery would have been impossible.[53] More significantly, however, the experiments with Home by Crookes were reported in a scientific journal rather than a Spiritualist periodical. *Medium and Daybreak* may have argued that Crookes' investigation "differs in no essential respect from the ordinary procedure at seances", but it nevertheless recognised its influence on the public.[54] Likewise, other Spiritualist periodicals initially criticised the Crookes' experiments as offering nothing new, but it was not long before they cited the scientific nature of the experiments in support of the phenomena, and pointed to the scientific status of witnesses such as Crookes and Varley.[55]

The initial response of some scientists to Crookes' experiments was to question his scientific competence. In an editorial note in *The Spectator* , it was stated that Crookes had offered his paper to the Royal Society but, as it had shown an "entire want of scientific precision ... the paper was not regarded as one deserving the attention of the Royal Society". When these claims were challenged by Crookes, *The Spectator* responded that it had simply been repeating the words of Professor Stokes, a secretary of the Royal Society. Similarly, the *Quarterly Review*, in a somewhat misleading article subsequently attributed to Carpenter, questioned the scientific competence of the experimenters. Huggins was described as one of those "scientific amateurs" who suffered from a "want of that broad basis of *general* scientific culture", while Cox was dismissed as "one of the most gullible of the gullible". Admittedly, Crookes had been awarded Fellowship of the Royal Society, but "this distinction was conferred on him with considerable hesitation". This latter claim was also challenged by Crookes and the Royal Society admitted that it was untrue, the admission subsequently being published in the *Daily Telegraph*.[56]

Elsewhere, however, sources suggest that some felt the investigations of Crookes and the Dialectical Society meant that science could no longer simply dismiss the phenomena out of hand. During the British Association for the Advancement of Science conference of 1871 in Edinburgh, for example, the *Edinburgh Evening Courant* was critical of Professor Allen Thomson's dismissal of all Spiritualistic phenomena. The editorial stated that the paper was by no means an advocate of Spiritualism, but it regarded Thomson's remark as unscientific, particularly as equally qualified scientists had investigated and testified to the reality of some phenomena.[57] Press reaction was certainly not always so positive,[58] but *The Spectator*, *Echo* and *Daily News* cautiously recognised the need for further investigation. So did the *Daily Telegraph*, which pointed out that "[t]he fact that some men, respectable in intellect and conversant with science, have testified their faith in the reality of the phenomena, makes it worth our while to investigate the matter with keener eyes than if the believers were all impulsive and unscientific observers".[59] Similarly, the *Times* stated of the Dialectical Society report that "if it proves nothing else it proves that it is high time competent hands undertook the unravelling of this Gordian knot". Presumably it was with this object in mind that the writer of the article had attended seances with Home at which, though he suspected imposture, he failed to detect any trace of it. That the phenomena appeared to be gaining at least some level of scientific credibility is further suggested when a letter from Henry Dircks to the *Times* claimed that "[n]o really scientific man

[53] Alexander, 1871, 2; *Journal of the Society for Psychical Research*, 4, 1889, 123.
[54] *Medium and Daybreak,* 2, 1871, 231; *Medium and Daybreak,* 2, 1871, 362.
[55] For example: *Spiritual Magazine*, 12, 1871, 347; *Spiritual Magazine,* 13, 1872, 1; *Human Nature*, 4, 1870, 192; *The Spiritualist*, 12, 1870, 92; *Human Nature*, 8, 1874, 13.
[56] *Spectator*, 1871, Jul 22, 879; *Spectator,* 1871, Jul 29, 917; *Quarterly Review*, 131, 1871, 341-3; *Daily Telegraph*, 1872, May 2.
[57] *Edinburgh Evening Courant*, 1871, Aug 7, 4. In fact, Varley wrote to Thomson, "I wish you to understand that it is not a question of *belief* in the marvellous on our part, it is a case of *actual knowledge* that these phenomena *do* occur. Time after time have I investigated them under conditions in which trickery was impossible" (cited in *Spiritual Magazine*, 12, 1871, 465).
[58] The *Pall Mall Gazette* called the Dialectical Society report "contemptuous", the *Athenaeum* referred to it as a "piece of absurdity", and the *Morning Post* described it as ""entirely worthless" (London Dialectical Society, 1873, 1-7).
[59] *Athenaeum*, 1871, Oct 28; other views collated in London Dialectical Society, 1873, 5ff.

believes in Spiritualism". In reply, letters cited the Dialectical Society investigation and the experiments of Crookes, and pointed out that Crookes and Varley and A. R. Wallace were clearly 'scientific men'. When Dircks responded that two or three names among so many was negligible, A. R. Wallace was only the most prominent of those who supplied the names of several other scientific men who attested to the phenomena of Spiritualism, and stressed the scientific nature of investigations into such phenomena. Such evidence suggests a growing awareness not only that it was the job of scientists to explain the phenomena, but that they had some way to go yet. As the *Times* put it, "our scientific men have signally failed to do their duty by the public, which looks to them for its facts".[60]

Yet so far as mainstream scientists expressed a considered view on Home's phenomena, it was one that pointed to the experiences being purely subjective. Such a view was expressed in *Nature* by Professor Balfour Stewart in an attempt to explain Crookes' results with Home. The same journal later published a similar view by the early anthropologist E. B. Tylor which was subsequently challenged by A. R. Wallace. The 'subjective experience' view reached a wider audience when *Punch* expressed its preference for it over the trickery theory and, in doing so, reflected the shift of authority from conjurors to scientists. Criticising the attempts by conjurors to expose the methods of mediums, the magazine pointed out that, "[m]en of science believe them to be either fictitious or subjective ... To give imitations, then, of those pretended phenomena, how clever soever, is not a clever way to prove Spiritualism humbug. What is there to imitate?".[61]

The precise nature of the subjective experience was not spelt out by Stewart, but Tylor spoke of mesmerism. Wallace responded by pointing out significant differences between mesmeric phenomena and Spiritualistic phenomena, but the points had been made already. Indeed, some of the most prominent experts on mesmerism, including William Gregory, John Ashburner and John Elliotson, had long rejected such a theory, the latter having been converted from a public position of scepticism as a result of a Home seance.[62] How long such a theory could have been maintained as an explanation for Home's phenomena is difficult to say but, as Home retired shortly afterwards, it was not severely put to the test.

## CONCLUSIONS

Home's phenomena challenged both scientific and religious attitudes, and attempts to explain how they were produced occupied both the minds of his contemporaries and a significant amount of column space in the periodical press. So far as the latter is representative of the former, most contemporaries regarded Home as a trickster, and supported this view by claiming that conjurors could explain the details. Conjurors, however, do not appear to have known what was going on. Their failure to explain, no doubt along with the general rise of scientific authority, led to the discourse increasingly becoming a scientific one, yet mainstream science provided no additional clues. Though many contemporaries no doubt would have accepted the broad accusation of trickery against Home, anyone comparing the available explanations with the available evidence would have become increasingly aware of the gap between the two. Those who had attended Home's seances were certainly aware of this gap, as were Spiritualists more generally. In terms of understanding Victorian Spiritualist beliefs, this is important. When Victorian Spiritualists articulated their beliefs, they repeatedly stressed that they had become convinced by the evidence, that is, by seance phenomena. As nobody else seems to have been able to provide an adequate alternative explanation,

[60] *Times*, 1872, Dec 26, 5 to 1873, Jan 6, 7
[61] *Nature*, 1871, Jul 27; *Nature*, 1872, Feb 29; *Nature*, 1872, Mar 3; *Spiritual Magazine*, 13, 1872, 1-4; *Punch*, 1873, Jul 19, 23.
[62] *Spiritual Magazine*, 5, 1864, 216.

perhaps it is time more credit was given to the reasons they themselves gave for their beliefs. Such an acknowledgement does not require acceptance that Home's phenomena were genuine, but it does challenge the assumption that the witnesses were gullible or irrational. Psychologists and anthropologists have often written on paranormal and magic beliefs in an attempt to explain what they regard as erroneous beliefs.[63] In doing so, they have been guilty of what Bloor has called the 'sociology of error', and it has been argued that such a position can be a hindrance to understanding views that conflict with our own.[64] So far as Victorian Spiritualism is concerned, one need not form any conclusion on the authenticity of the phenomena to acknowledge that Victorians could have been convinced by evidence that eluded explanation by the most eminent conjurors and scientists of the period.

No doubt many were influenced by the emotional and intellectual crisis of faith prompted by Biblical criticism and Darwinism, but this in turn begs another question. Rather than asking why some Victorians came to be convinced of Spiritualism, perhaps one should be asking why others did not. If the mid-Victorian period was one characterised by a crisis of faith, why was there such a strong rejection of evidence of an after-life when nobody had an adequate alternative explanation for such phenomena? One answer to that question, I would suggest, is that seance phenomena had all the problems of miracles without the advantages. While it was often remarked (and not only by Spiritualists) that the evidence for seance phenomena was stronger than that for Biblical miracles[65], the latter clearly had significant cultural support. It was also said often that the religion supported the miracles, not vice versa.[66] More recent miracles, on the other hand, such as those associated with Roman Catholicism, had long been dismissed as the result of imposture and delusion. It is hardly surprising that evidence for such phenomena was treated with scepticism. In addition, of course, Home would have been seen as part of a wider movement involving significantly less impressive mediums, several of whom were publicly exposed as frauds. Yet this cannot be the whole story, since even many of the individuals who accepted the facts of Home's phenomena did not accept they were the result of spirits. Some preferred to attribute the phenomena to a new kind of natural force, while others simply declared they could not accept spiritual agency.[67] Similarly, so far as the periodical press cautiously acknowledged that the phenomena appeared to have some empirical support, it did so in language that favoured natural rather than supernatural agency.[68] The overwhelming rejection of supernatural agency, despite it being the explanation offerred by Home for otherwise inexplicable phenomena, suggests that, if there was any crisis of faith involved here, it was in the modern scientific worldview, and it was the result of a 'crisis of evidence'. The response of mainstream scientists to this crisis of evidence - to question the scientific competence of those who had tested Home, and to argue that what they reported had not in fact happened - could be seen as supportive of a Kuhnian view of science, in which the dominant paradigm may ignore (or even suppress) anomalies of fact or theory.[69] However, the views of the periodical press (which included false accusations) suggest that the threat posed by Home's phenomena may be viewed in more general sociological terms. Bauman has written that modernity's quest

[63] For example: Alcock, 1981; Gilovich, 1991; Zusne & Jones, 1989.
[64] See Wilson, 1967 on magic beliefs and Wooffitt, 1992 on paranormal beliefs.
[65] For example: Chambers, 1859, 23; *Spiritual Magazine*, 4, 1863, 177; *Spiritual Magazine*, 4, 1863, 356; *Fortnightly Review*, 85, 1874, 89-90.
[66] See, for example: London Dialectical Society, 1873, 1-7.
[67] Examples of the former are William Crookes and Serjeant Cox. See also: Alexander, 1871, 48; *Human Nature*, 7, 1873, 162; *Nineteenth Century*, 27, 1890, 576-81. Examples of the latter are William Gregory (*Spiritual Magazine*, 4, 1863, 451) and William Huggins (Home, 1921, 201) and W. H. Ashurst . See also: *Spiritual Herald*, 1856, 43; *Spiritual Magazine*, 1, 1860, 84-86; *Spiritual Magazine*, 1, 1860, 151; Baker, 1862; Home, 1863, 174; Home, 1921, 87; Home, 1921, 137.
[68] *Times*, 1872, Dec 26, 5; *Echo* quoted in London Dialectical Society, 1873, 7.
[69] Kuhn, 1970, chapter VI.

for order was a war against ambivalence. Elsewhere, he has extended Weber's notion of modernity as a 'disenchantment of the world', arguing that "[t]he war against mystery and magic was for modernity the war of liberation leading to the declaration of hostilities that made the unprocessed, pristine world into the enemy", an enemy he later describes as "the grey area of ambivalence, indeterminacy, and undecidability"[70]. The attempts of conjurors, scientists and most of the periodical press to debunk Home's phenomena might be seen as part of modernity's 'dis-enchantment of the world', as a battle in its 'war against ambivalence'. This paper details how such a battle was fought in the mid-Victorian period. That similar debates about paranormal phenomena continue to this day suggest that the war has never ended.

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[70] Bauman, 1991; Bauman, 1992, x-xvi.

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# BACKWARD CAUSATION AND THE HAUSDORFF-DIMENSION OF SINGULAR EVENTS

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**ABSTRACT**

The theoretical paper deals with the finding that the effectsize of nearly all psi-experiments shows a tendency to decline over time. Thus one gets the impression that experimental psi is not only a very small effect but also restricted in relation to repeatability. In spontaneous cases, however, large effect seem to occur. This seemingly paradoxical situation can be explained by applying the Model of Pragmatic Information (MPI) to backward causation and introducing a fractal dimension of time. For some special examples a precise mathematical definition is provided. Some experimental data are supportive to this approach.

## 1. INTRODUCTION

In a recent meta-analysis Dick Bierman (2000) shows that nearly all psi-experiments which had been performed since the days of J. B. Rhine exhibit a significant inter-experimental decline-effect. For such a large database including a large number of different experimental designs and settings it seems highly improbable that this result could be explained by psychological factors such as loss of motivation, exhaustion or experimenter expectation. Even though this psychological interpretation is in principle unfalsifyable it is reasonable and legitimate to assume that the inter-experimental and possibly also the intra-experimental decline-effect exhibits an essential characteristics of psi-phenomena.

Moreover, certain theoretical models (the so-called observational theories, OTs) predict such intrinsic decline effects. Within this class of models for psi it is assumed that (human) observation of the experimental results (i.e. feedback) is responsible for deviations from certain expectation-values of the random process (target). There are two possible intrinsic mechanisms which lead to decline effects. The first one, which will not be discussed here in detail, is the so-called divergence effect. It is assumed that future observers (such as readers of the published results) might blur out the "psi-source" of the initial operator (subject or experimenter). This model needs further assumptions about future observers. The second mechanism for decline is more fundamental, because it has to do with the notion of time and timely order. In this paper we discuss the problem only in the context of one specific candidate of the OTs, namely the Model of Pragmatic Information (MPI) (see Lucadou 1995a). It is true, that there is still no definite conclusion whether metaanalyses exhibit inter-experimental decline effects for all kinds of psi-experiments. But from the point of view of the MPI this is comprehensible, because in the MPI each experiment is considered as a *unity* which reflects the meaning of the experimental situation and which cannot be divided in parts or accumulated with other experiments without essential loss - at least as far as replications are not identical. This is in agreement with Z. Vassy's finding that the psi-effect is distributed in a holistic way over the whole run (see Vassy 1990).

## 2. BACKWARD CAUSATION

Decline over many experimental studies means that these studies cannot be regarded as independent. This is of course not jet a model but just a more general description. It is normally assumed that the mechanism underlying time dependent series is that previous events influence later events. In parapsychological experiments, however, such an influence cannot be assumed prima-facie because under the null-hypothesis any influence on the random target sequence is ruled out by experimental conditions. In the OTs an anomalous influence is assumed, which, however, comes from future events, because it results from the observation of the feedback. This means that the timely order is reversed in this case. Some have introduced the term "backward causation" for this situation. There is also some direct empirical evidence that backward causation really exists, because pk-experiments with prerecorded targets (PRT) turned out to show effect-sizes of the same magnitude as "normal" pk-experiments. The concept of backward causation could also be useful to describe precognition (just as the opposite of the coin).

The MPI assumes that psi is a non-local process (or more precisely a non-local correlation) and thus intrinsically includes backward causation. The question we have to ask now is: What is a physical effect which depends from future instead of from the past.

## 3. WHAT IS A PHYSICAL EFFECT?

Systemtheoretically speaking any physical effect (E) can be defined as an information about a physical system gained by a measurement. Information is defined as a signal (S) which enables us to decide at least two alternatives, if a certain context (C) is given. S could be for instance a random sequence including a part with a deviation from randomness (e.g. noisy signal, or a fluctuation). C gives a criterion how the deviation has to be interpreted (e.g. a pk-effect is present). Note that S alone would not yield any information. Thus a physical effect always needs not only a signal S but also a context or a criterion C for its existence. The two alternatives are defined by the decision whether an expected effect is present or not present.

In this sense, a correlation K between the variable A and B is no simple "physical effect", because the measurement of A and B alone does not yet allow to decide whether the correlation K is present or not. To do this, both signal S(A) and S(B) have to be "combined" or "compared" to establish the correlation K. This is of crucial importance for our problem of backward causation. Formally we can write the situation as follows:

In the case of a normal causal link we get the timely order:

S -> C -> E (-> indicates the timely order)

Signal S (and to some extend criterion C) can be considered as "causa efficiens" (in the Aristotelian sense) for the effect E

In the case of backward causation the time order is reversed at least concerning the criterion C to establish an effect E

S <- C -> E

Here C can be considered as "causa finalis" (dto) of E.

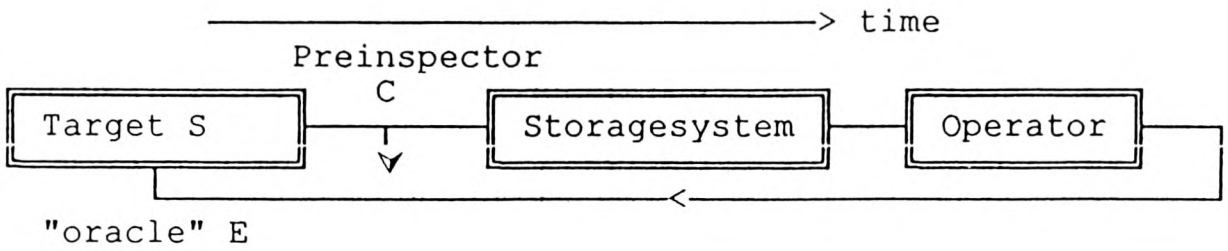
Finally we have the situation of (non-local) correlations K. Here, a timely order cannot be defined anymore:

[S(A), S(B)] -> K ([ ] indicates "comparison")

Nevertheless K is sometimes interpreted as an effect E.

## 4. PHYSICAL EFFECTS AND BACKWARD CAUSATION

If backward causation would lead to a real physical effect this would enable us to build an "oracle" which could be used to create an intervention paradox:




The "oracle" (E) would be a significant deviation of an random sequence from the null-hypothesis in an PRT-experiment (S) which operationalizes backward causation. If the criterion C (C: $Z > Z_{crit}$, Z means Z-score) is fulfilled it is decided by the "preinspector" (for instance by a computer) that the random sequence (S) will not be used for the subject. This is of course paradoxical because the operator will not be able to exert an influence E on the sequence, which however, was the reason for the selection.

The MPI starts from the basic assumption that nature does not allow (intervention) paradoxes. In the MPI this is formulated as the "two fundamental laws of parapsychology":

- Psi-phenomena are non-local correlations in psycho-physical systems which are induced by the pragmatic information which creates the system (organizational closure, OC).
- Any attempt to use a non-local correlation as a signal transfer (= physical effect in the sense of "causa efficiens") makes the non-local correlation vanish or change.

One way how backward causation could fulfil law II. (or avoids the intervention paradox) is that "nature" discriminates the signal S such that the criterion C cannot be reached. In parapsychgology the criterion C is usually the Z-score.

$Z = (T - n*p)/s$

T means "hits", n = number of trials, p = probability for a hit, s is the standard deviation:

$s = \sqrt{(n*p*(1-p))}$, $\sqrt{}$ means square root

If one defines the effectsize E as: $E = (T-n*p)/n$, one obtains a critical effectsize $E_{crit}$ which cannot be

surmounted. If n increases in a single experiment or in a series of identical experiments E must decline with n:

$E < E_{crit} = const/\sqrt{(n)}$

The value of const may depend from the experimental setting and/or psychological conditions and is not specified here. For n = 1 we get the maximal effect. We call such a situation a "Singular Event" (SE). The term "singular" refers to the term "singular point" in mathematics, where it describes a singularity of a function. For larger n we obtain an increasing decline effect, especially if we combine identical experimental runs (see Lucadou 1995a). We will see later that singular events are somewhat different from single events. In statistical experiments singular events do not play a role because the power of any statistical test reaches its minimum for n = 1. In spontaneous cases, however, the situation is quite contrary. Here mostly singular events are observed. Usually it is assumed that the validity of singular events does not depend on the fact, that it occurs only once, but on the quality of its documentation (QD). It is clear that in this situation $E_{crit}$ is no good criterion for the second law (II.). In this case the MPI predicts that the quality of documentation QD is restricted ($QD_{crit}$) by the following formula:

$QD_{crit} * E < OC$ (OC means organizational closure of the System)

In recent experiments other criteria than Z-scores have been used to validate psi-effects (see Lucadou 1986, Pallikari 1999, Atmannpacher 2000). In these cases $E_{crit}$ will probably show a different functional dependency of n, however, it must be a function which decreases with n. Further research is needed here.

It is important to mention that the MPI assumes that the second law does not depend on the subjectivistic view, whether one actually uses the criterion C to create an intervention paradox or not. Whenever it is operationally possible to use the criterion C the decline occurs. If, however, the experimental design is such, that this is operationally not possible, no decline effect will occurs. For instance a randomized matching could prevent the "preinspector" to use the criterion C.

## 5. WHAT IS AN EVENT?

In science we mainly have to do with experimental events which are in most cases statistical, which means that many measurements of a prepared system are taken. "Prepared" means, that the system is not in an natural context but a given experimental setting. The events are prepared to be operational, which means observational and documentable. We call such events: *stochastic events*.

Sometimes, but not very often, the signal to noise ratio is such that repeated measurement is not necessary. We call such events: *experimental events*.

Most events that occurs in everyday life, however, are not experimental, they are not prepared, but very often they are preparable. Otherwise we could not plan or control anything. They can also be observed and even if they are single events we have no principle problem with documentation. We call such events: *regular events*.

There is sometimes a problem, if such regular events occurs very seldom, like eclipses, meteorites etc. In this case, public and science is inclined to neglect them if they are not generally accepted, because they occur so spontaneously that it is difficult to be prepared for a proper observation and documentation. We call such events: *rare events*.

Many persons believe that spontaneous paranormal events (SPE) are rare events, however this is not true as many representative inquiries have shown. It is also not true that they are not accepted because they are theoretically not explained. This may be true for the small group of scientists, but today most ordinary people believe that paranormal phenomena exist. However, there is a problem with observation. Paranormal phenomena (SPE) seem do avoid observation (see Lucadou 1995b). We call them *elusive events*.

Finally *singular events*, as defined above, may be part of all sorts of events defined beforehand such as stochastic, experimental, regular, rare or elusive events. The property which defines them is that they are part of a series of events which belong together or, to be more precise, which correlates within a group of events. Thus one can define a transition-probability from the singular event to any other members of the group. If psi-experiments are not independent in time - as we have assumed above - each trial is a singular event. A good example from mathematical statistics for such a group of events are Markov-chains. They are described by transition matrices. One should mention here, that not all time series with transition probabilities from one event to others are necessarily Markov-chains, for instance, if the transition-probabilities itself depend on time. In this case one could, however, as an approximation use combinations of Markov-chains with different transition-matrixes and time-scales. For the purpose of discussion we start with simple binary Markov-chains.

Normal random sequences can be regarded as degeneration of Markov-chains. They show always the same transition probability regardless which event just occurred. For such sequences the events $E_i$ and $E_j$ at different point of time i,j are independent:

$p(E_i,E_j) = p(E_i) * p(E_j)$

## 6. How to produce randomness?

In statistics it is assumed that we can enlarge effects by increasing the number n of stochastic events. Especially in parapsychology the so-called Rhinean paradigm started with the assumption that psi-effects can be accumulated statistically. However, the inter- and intra-experimental decline effect, discussed above, threatens this paradigm. Nevertheless there are also some empirical hints that psi may be enhanced under certain conditions. Psychological conditions like psi-conducive state, however, are not meant here, they cannot be easily accumulated in a statistical manner. Here, we deal with the procedure how random events are generated in psi-experiments. Normally physical random event generators REGs are used to produce the target sequence of psi-experiments. In most cases these REGs produce pure chance results with a given target-probability e.g. $p = 1/2$. There are only a few studies which deal with the question, whether the probability p or the method of random generation has an influence on the effect-size of psi. Schmidt found that the complexity of the REG does not influence the psi-effect. The target-probability seems not to have a dramatic effect too. Most researchers have concentrated on the requirement that the REG used in the experiment should be free of bias and other "deficiencies" in order to rule out statistical artefacts, because psi is only defined by exclusion. (Here we do not consider studies with pseudo-REGs because in this case it not clear, whether the usual statistical evaluation techniques are valid anymore and how the effect-size has to be interpreted, see Krengel 1979). There exists only one study (at least to my knowledge) where a different type of REG namely a Markov-REG was compared with the usual REGs (see Lucadou 1986). The difference between the Markov-REG and the usual one was extremely significant and at that time totally counter-intuitive.

The "normal" REG was a binary random-sequence with the target-probability p = 1/2. The Markov sequences was produced in the following way: The pulse rate $R_i$ of a radioactive SR90 decay is measured after a fixed interval at a certain instance i. $R_i$ is compared with the pulse rate $R_{i-1}$ of the previous instance i-1.

If $R_i < R_{i-1}$ then a miss "0" is generated

If $R_i > R_{i-1}$ then a hit "1" is generated

If $R_i = R_{i-1}$ then the target generation will be repeated, which means that this case will be ignored. Since the variance of $R_i$ is large enough the last case only occurs rarely.

It can be shown (see Lucadou 1986) that the resulting random sequence is a Markov-chain of first order which is specified by the following transition matrix:

$$\mathbf{M}_{ij} = \begin{pmatrix} p_{00} & p_{01} \\ p_{10} & p_{11} \end{pmatrix} = \begin{pmatrix} 1/3 & 2/3 \\ 2/3 & 1/3 \end{pmatrix}$$

$p_{00}$ describes the probability to get a "0" after a previous "0" and so on. It is remarkable that these values hold exactly and do not depend on the form of the distribution of the initial random process. The only requirement which must be fulfilled is that the single events of the source are stochasticly independent. The transition matrix completely describes the Markov-chain. Especially, it follows that the probabilities of a hit and a miss in the whole sequence are equal:

$p_0 = 1/2 \quad p_1 = 1/2$

The distribution p(n,T) of hits T in such a Markov-chain of a given length n can be calculated from an algorithm (see Lucadou 1986). For n = 10 this distribution is very similar to a normal distribution (Gaussian) with p = 1/2 and $s = \sqrt{(n/12+1/6)}$. For large n one can even use $s = \sqrt{(n/12)}$. The advantage of the Markov-sequence compared with a normal random sequence is, that a "hit" is directly linked with a physical variable (e.g. decay-rate). A sequence of hits means a momentarily increasing decay-rate.

Since the variance (standard deviation, $s = \sqrt{(n/12)}$) for the Markov REG is smaller than for normal REGs ($s = \sqrt{(n/4)}$) it was assumed that the psi-effect would be smaller. In parapsychology and especially in the OTs it seems plausible that divergent processes can more easily be affected by pk. However, the opposite result was obtained: The Markov-REG turned out to be more than twice as effective (or sensitive) as the normal one. (The sum of all significant correlation coefficients between psychological and physical variables was 2.2 times larger for the Markov-REG than for the normal one, details see Lucadou 1986).

## 7. HAUSSDORFF DIMENSION

In mathematics there exist a generalisation of the term dimension known from geometry. In Euclidean geometry we know one -, two -, and three-dimensional objects such as line, plane, and cube. If we define a as the number of parts we need to produce the same enlarged object, and m as the magnifying- or scaling factor from the initial to the enlarged object, the Hausdorff-dimension D of the object is defined as:

$$a = m^D \quad \text{or} \quad D = \log a / \log m$$

As examples may serve:

Straight line: a = 3, m = 3 : D = 1

Square: a = 9, m = 3 : D = 2

Cube: a = 27, m = 3 : D = 3

For fractal objects like e.g. the Koch-curve (_/_) we get rational numbers for D:

Koch-curve: a = 4, m = 3 : D = 1,262

To obtain the Hausdorff-Dimension of an object empirically, one uses a lattice of the width ε which contains the object and counts the number N(ε) for smaller and smaller ε. Than the negative slope:

$D = - \log N(\varepsilon) / \log \varepsilon$

gives the Hausdorff-dimension of the object.

## 8. Scaling events

Normally natural timely ordered events (for instance a random sequence) cannot be "enlarged" like a film in slow motion. However this becomes possible to a some extend if one does not consider singular events themselves but their transition matrices.

The transition probability of a Markov-chain starting with the singular event i to the event j is given by the transition matrix $\mathbf{M}_{i,j}$. It can be calculated from $\mathbf{M}_{i,i+1}$ by the following rule:

$$\mathbf{M}_{i,j} = \mathbf{M}_{i,i+1}^{(j-i)}$$

The power is defined by the usual matrix multiplication applied j-i times.

For a normal binary random sequences $\mathbf{M}_{i,i+1} = \begin{pmatrix} 1/2 & 1/2 \\ 1/2 & 1/2 \end{pmatrix} = \mathbf{M}_0$.

In this case $\mathbf{M}_{i,j}$ always remains $\mathbf{M}_0$. This means that it is the same for all singular events and does not change with increasing j. From this point of view a normal random sequence is a very static object; it has no "history", no "extension" and; no "internal connectivity".

Markov-chains, however, show such an "extension" or "internal connectivity" or "history". The transition matrix $\mathbf{M}_{i,j}$ changes from step to step with increasing j. But for certain values of $p_{00}$, $p_{01}$, ... it converges to $\mathbf{M}_0$.

As an example the transition matrix of the Markov-chain used in the experiment described above is given for 8 subsequent steps (only the first row of the Matrix: $p_{00}$ $p_{01}$; is given, the second one is symmetric):

1/3 2/3; 0.556 0.444; 0.481 0.519; 0.506 0.494;
0.498 0.592; 0.501 0.499; 0.500 0.500; 0.500 0.500; ...

One can see that the elements of the matrices converge rapidly (exponentially), after 6 steps the difference to $\mathbf{M}_0$ can be neglected.

In general we can now ask the question how many steps (singular events of a Markov-chain) are needed for a given matrix $\mathbf{M}_{i,j}$ to approach $\mathbf{M}_0 \pm \alpha$ (a given error $\alpha$). This sequence of d subsequent steps is equivalent to a normal random event. It can be interpreted as a virtual unity of interrelated events. We call

such a sequence a "closed sequence of scaling length d (CS)". In a given run of n trials several of such CS can exist. Thus the "effective length" l of the run is only l = n/d. We define the Hausdorff-dimension D of the run in the following way:

$$D = \mathrm{Min}_{i=1,n}^{d} \left(\mathbf{M}_{i,i+d} = \mathbf{M}_{i,i+1} = \mathbf{M}_0 \pm \alpha\right) \text{ with } \alpha \in \alpha,\ \alpha = 1/n$$

The Hausdorff-dimension D of a sequence is defined as the smallest number of subsequent steps d for all n singular events of the sequence, such that each element of $\mathbf{M}_{i,i+d}$ lies in the $\alpha$-interval of the corresponding element of $\mathbf{M}_0$.

The value of $\alpha$ represents the whole run, and takes into account that in longer runs internal correlations have a longer reach, so D increases slightly with n. As result one can write:

$$\mathbf{M}_0 = \mathbf{M}_{i,i+1}^{D} \quad \text{for Markov-chains.}$$

Similar to the geometrical case the Hausdorf-dimension for singular events tells us, how many elements are needed to create a new "enlarged" unity.

This means, that the transition matrix $\mathbf{M}_{i,j}$ of the sequence is "compared" with the transition matrix $\mathbf{M}_0$ of a random sequence. A possible interpretation of this definition is that every singular event is not an independent event which counts for its own value, but is only a "partial" event. For a normal binary random sequence D = 1, and each "singular event" (in the limit) is independent. For the Markov-chain in our experiments given above with n = 600, $D \approx 6$. This means that each 6 subsequent trial form a CS. Thus one could also say that a singular event in the sequence is only "a sixth of an event". If such a sequence is target of a psi-effect, obviously such "partial events" do not fully contribute to the limitations which are induced by the second law (see paragraph 4.). Therefore we can reformulate the limiting formula: $E < E_{crit} = 1/\sqrt{(n)}$ by the following expression:

$$E < E_{crit} = \mathrm{const}/\sqrt{(n/D)}$$

For the Markov-chain given above this means that the psi effect could be larger than for a normal binary random sequence of the same length n by a factor of $\sqrt{(6)} = 2.4$. One could also say that dependent singular events are better targets for psi-effects. Further it is to be expected that the first singular event shows the highest effect-size. This could give a natural explanation for the fact, that spontaneous psi-events (SPE) seem to have a much higher effect-size than experimental events. Everyday life-events and especially SPE are normally dependent events, which are part of long histories.

Finally it may be an interesting theoretical question for further research to find out whether the distinction between the level of stochastic events, and the level of their description by transition matrixes can be interpreted as "epistemic-" versus "ontic" description in the sense Hans Primas has introduced it (see Primas 1999).

## 9. Conclusion

If we assume that psi-events are elusive singular events of fluctuating physical systems which are able to "connect" experiments in such a way that they are not independent among each other anymore (as discussed in 1. and 2.). This has of course consequences for the interpretation of spontaneous cases on one side, and the design of experiments on the other side.

From our considerations a natural explanation for the seemingly large effect-size in SPE emerges. SPE are interwoven with (personal) histories such that psi has enough CS "to link with". Further, the limiting laws do not apply because the events are spontaneous, or of short duration, or of poor documentation quality, and mainly elusive (especially RSPK-phenomena, see Lucadou 2000).

In principle the same applies for experiments. First of all, it seems not useful to work with "ideal" REGs anymore. One could speculate whether the decline-effect observed in meta-analyses may partly be a result of using increasingly "better" REGs. Of course one has to avoid statistical artefacts. A possible solution of this problem could be the use of Markov-REGs. However, Markov-REGs must not be build from pseudo-REGs - but this is another story, which will not be discussed here. A further experimental requirement from our consideration is that very long runs are not really helpful because due to the limiting relations (see 4.) the psi-effect would be blurred out. This could also be part of the observed decline, especially in pk-research, where the run length has become abundantly large during the last decade. Finally, it is expected that there is a optimal value for the transition probability $p_{00}$ and/or $p_{01}$ in binary Markov-chains, if used as a psi-target. If the probabilities would be 1/2 we have a normal binary random sequence, which, from our point of view, is not advantageous, because psi has - so to say - no "working surface". On the other hand, if the probabilities would be near 0 or 1, the Markov-chain degenerates to an oscillating sequence which also provides no "working surface" for psi. The optimum may be between this two values. But this is a question of further research.

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# QUANTITATIVE INVESTIGATION OF THE GENERAL WAYNE INN

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## ABSTRACT

Apparitions and poltergeist-like disturbances were reported by the owner and employees of a wayside inn in Merion, Pensylvannia. The legend that a "ghost" haunted the premises had persisted for more than two centuries. Witnesses were interviewed and their accounts were evaluated.

The principal technique employed to study the reports used quantitative measures to test three sensitives and three controls. Participants were asked to individually tour the premises and mark on floor plans locations where they sensed a ghost (sensitives) or where they believed a credulous person might report a ghost (controls). Each participant also responded to a checklist containing brief descriptions of the reported phenomena that were randomly interposed with descriptions of plausible disturbances that no one had reported.

One sensitive's floor-plan responses significantly resembled the locations of the disturbances reported by witnesses ($p = .026$), and the combined floor-plan responses of sensitives bore a suggestive correspondence to the witnesses' reports ($p = .084$). One sensitive's checklist impressions of the ghost suggested the ghostly activities described by witnesses ($p = .059$). Control participants, neither individually nor as a group, produced test responses that corresponded to the witnesses' reports.

Ambient electromagnetic fields at the inn were evaluated to determine if the fields were stronger at sites where disturbances had been reported than they were at sites where no ghostly activity had been reported. No significant differences in electromagnetic fields were found for peak strengths, average strengths, or all measured strengths. These findings imply that electromagnetic fields are not a plausible determinant of the reported phenomena.

Infrared photography, Polaroid photography, video recording, and audio tests were conducted. None produced anomalies that corresponded to the witnesses' reports. Projective psychological tests were given to three witnesses. Results indicated that one of the percipients' reports should be evaluated with special caution.

## INTRODUCTION

The German word *poltergeist* was presumably coined to distinguish a noisy ghost from a less obtrusive one and it continues to denote a mischievous spirit or "ghost" in German. By 1848, the word had become part of the written English language (Merriam-Webster's Collegiate Dictionary). More than one psychical researcher in the late nineteenth century observed that boisterous ghosts tended to frequent houses in which children were living. This is hardly surprising since households in those days were generally comprised of large families, and children were not uncommonly family members. Indeed, youngsters with their irrepressible energy and mischievous tendencies were generally the first to be fingered as the culprits when rowdy, unfathomable disturbances took place. Alternatively, hysterical young female servants drew reprobation as the supposed hosts of the bewildering events.

With the advent of psychoanalytic theory and its seminal constructs of unconscious motivation and covert sexual drives, a prepubescent, person-centered theory of poltergeists was formulated. The new theory of "ghosts" was in step with the zeitgeist; the afterlife was out of favor but neurosis was very much in vogue. Evidence in support of the theory was marshaled and it was soon widely adopted—bolstered by convergent theories and legitimized by scientific-sounding terms like focal person, attenuation, and RSPK. Yet doubts about the validity of the ghost vs. poltergeist distinction persisted, and theoretical discrepancies accumulated in the empirical database.

Stevenson (1972) took issue with the person-centered theory in a paper charmingly titled, "Are poltergeists living or are they dead?" Maher (1991) ventured that poltergeists could in principle be both living *and* dead because discarnate entities might be interacting with the energy of living persons to effect physical manifestations. Gauld and Cornell (1979) attempted to sort out 500 haunting and poltergeist cases based on their characteristics, but cluster analyses failed to eliminate apparitions from the poltergeist category, or poltergeist features from the haunt category. Roll (1977) conceded that haunted houses could host RSPK outbreaks and volunteered that "To an extent hauntings, too, may be person oriented" (p. 400). Alvarado and Zingrone (1995) found no more signs of intelligence in the characteristics of hauntings with apparitions than in those without them, while signs of intelligent guidance were reflected in certain poltergeist object flights (Roll, 1977). Stokes (1997) noted that the beginnings of RSPK object levitations were rarely observed, reflecting Sidgwick's (1885) observation that ghosts do not tend to materialize in places at which percipients have already been looking.

Gerding, Wezelman, and Bierman (1997) have speculated: "Given that the nature of psi is in principle anomalous—modeling, experimentation, and categorization of psi can take on any of an infinite number of metaphorically based forms" (p. 156-157). Recurrent psi effects that have been identified suggest that it is not futile to look for order and meaning in parapsychological occurrences. However, after more than a century of scientific scrutiny, it appears that the classification of a case, and whether or not to describe disturbances as "ghostly," is left to the whimsy and personal preferences of the investigator.

## THE CASE

In early August, 1988, M.C.M. was contacted by representatives of a TV production company with a request that she investigate reported haunting occurrences at the General Wayne Inn in Philadelphia for the NBC-TV series "Unsolved Mysteries." M.C.M. agreed to visit the inn during the last week of August to conduct tests on the premises. Meanwhile, a full-time researcher was employed by the company to gather background information and documents pertaining to the disturbances. M.C.M. engaged in lengthy discussions with the film director, whose contract required that he conduct interviews with witnesses of the disturbances for on-air presentation. M.C.M. advised him of techniques for eliciting candid testimony, and provided him with pertinent follow-up questions to ask when documenting witnesses' accounts of the disturbances. The purpose of the following narrative is to acquaint readers with the history of the General Wayne Inn and the reports of those who believe they have experienced ghostly activity on the premises.

Built in the Quaker village of Merioneth, Pennsylvania, just outside Philadelphia, The General Wayne Inn dates back to 1704. Robert Jones purchased the land on which it stands from Edward Rees for twenty shillings; Rees had bought the one-acre plot from William Penn. Originally dubbed The Wayside Inn, it is now listed on The National Register of historic places.

When Jones died in 1747, the inn was rented to Anthony Tunis, who ran a prosperous tavern for the next thirty years. The Tunis Ordinary was a popular rest stop for stagecoaches and wagons heading westwards. It served a prix fixe meal that included pork pies and grog (a drink of rum and water in equal parts). Meals and lodging could be had for a quarter apiece; horses were fed and stabled for an additional fifty cents. The tavern also held a general store and post office. Benjamin Franklin, appointed by England's King George III as Postmaster of the colonies, supervised mail at the inn in 1763—a time when postage was paid by the recipient and charges were based on how far a letter had traveled.

Abraham Streeper acquired the inn in May of 1776, just prior to the onset of the American Revolution. Streeper was quick to answer the call for army recruits nailed to a post in front of his tavern. Leaving the inn in the custody of his wife, he joined the 4th Pennsylvania Regiment and rose to the rank of lieutenant. While he was away, "Mad Anthony" Wayne—on advance patrol for George Washington after the devastating defeat of American soldiers at the Brandywine—stayed overnight at the inn on September 13, 1777, with what remained of his troops bivouacked in the field outside. George Washington and the Marquis de Lafayette slept the following night at the inn, and ate a well-documented breakfast the next morning. Two days after they departed, a stagecoach arrived with six members of the Continental Congress fleeing Philadelphia for the safer climate of York. Philadelphia was soon to be taken by the British, and it wasn't long before red-coats occupied the surrounding territory, and Streeper's Inn as well.

Both the Continental Army and the British sought to control Streeper's Inn because it was a centrally located hub of espionage that could serve as a strategic command post. Feisty Captain Allan McLane recaptured the tavern during the bitter winter of 1777-78. A colorful character whose exploits made him the bane of the British, McLane used white sheets to camouflage his Iroquois allies so they could creep surreptitiously across the snow to attack the inn from advantageous firing positions. The ruse was successful, but Hessian soldiers (German mercenaries employed by the British) soon regained control.

Legend has it that unbeknownst to the Hessians a secret tunnel had been built by the revolutionaries that led from the inn's cellar to an unobtrusive part of the neighboring field. Although accounts differ, one version holds that when a young Hessian soldier was sent to the cellar to procure wine for the victory celebration, he was ambushed and killed by revolutionaries hiding there. They promptly buried his body in the tunnel so that it would not give them away. Locals residing in what is now Lower Merion township believe that the ghost of the Hessian soldier still haunts the inn.

It was not until 1795, when General Wayne returned for a three-day fête celebrating his successful Indian campaign, that the inn's name was changed to honor him. The tavern had other distinguished visitors in the following century. Edgar Allen Poe patronized the inn from 1839-43, and he is said to have revised "The Raven," while sitting by the fire in the Post Office Dining Room. He reportedly scratched his initials into a windowpane with a diamond ring borrowed from his affluent friend and biographer, Henry Beck Hirst. (The antique glass pane was discarded in the 1970s, when the glass was shattered by vibrations from a jackhammer drilling up the street in front of the inn.)

For more than fifty years, the inn served as a polling site for the Lower Merion Township, and the first recorded sighting of a ghost dates back to the election of 1848. A woman who had gone to the cellar to retrieve a box of fresh ballots reported to her supervisor when she returned that she had encountered a soldier in a green coat down there. (Hessians wore green uniforms with yellow lapels.) The basement sighting of the soldier was included in the supervisor's official report to the Board of Elections.

More recent history includes a variety of ghostly phenomena reported by the inn's past and current employees, and by its present owner. Despite the ghost legend, the inn is regarded as a friendly tavern and a sociable work environment; employees tend to remain at their jobs for extensive periods. A former hostess, who was first employed as a waitress in 1960, recounted a peculiar experience. She maintained that she did not hear about the legend of the ghost until after her experience had occurred.

> It was around . . . three-thirty in the afternoon, and I was setting up for dinner. And I heard someone calling me—just my name . . . I heard this three or four times. But I was so engrossed in setting up the table . . . I turned to say—I was getting a little angry too—and I turned to say, "What do you want?" . . . I saw this man . . . He was a man standing on the stairs, and he had this uniform on . . . a Revolutionary War soldier, only to me he was like a general . . . And he looked so startled when I said, "What is it?" And, just like that, he disappeared.

Asked to provide more detail about the characteristics of the apparition, the hostess continued:

> I would say it was three-dimensional . . . The figure that I saw on the stairs was not transparent. I couldn't see through the figure, and that's what startled me so . . . The bartender . . . looked at me and he said, "What's the matter? You look like you saw a ghost." And I said, "Well, I think I did."

When asked about the duration of her experience, the hostess recalled:

> I would say five seconds? It wasn't—didn't seem like a very long time. Just long enough. . . . He had his hand on the railing and he sort of looked around and he looked startled, like he didn't know where he was . . . And then as I was looking at him, he disappeared.

The hostess was asked to provide her own interpretation of the experience, and to comment on the significance it held for her.

> I thought he was calling me . . . He called me three or four times . . . like he wanted . . . some help or something . . . I never thought for a minute that it was a hallucination or the light or anything . . . There was no shadows or the sun didn't hit the stairs . . . I have no explanation for it whatsoever . . . I just know it happened.

A waiter who had worked at the inn for more than thirty years reported several odd occurrences. He was told about the ghost by one of the inn's porters soon after he became employed. Subsequently, he repeatedly witnessed a puzzling occurrence in the bar. Suspended above the aisle in the middle of the horseshoe-shaped bar, and running along its length, is a cabinet mounted from the ceiling to store liquor glasses and other bar accoutrement. The waiter recalls:

> In the afternoon I would sit there at the bar, and all of a sudden all the glasses would start shaking on both sides of the bar. One day, I got up and ran outside to see if there was a truck, and there was nothing around. It was just a quiet afternoon . . . We would sit down after lunch, and all of a sudden the glasses would just shake . . . Sometimes it happened two or three times a week and sometimes it'd happen, maybe once a week. But it happened lots of times . . . And the bartender and I would look up and say . . . "the ghost is shaking the glasses" . . . There was definitely nobody around, and no one upstairs or no one moving any furniture or anything. They just shook.

The same waiter recalled an episode that occurred years earlier, which had greatly baffled him at the time. He relates:

> On a Friday night, we were all sitting around the bar . . . Saturday morning we had a big wedding coming in, and we decided we would set the dining room up for the wedding. That way we can come in a little later and . . . take it easy. So, Friday we set the whole room up—put all the napkins, tables—set everything up. But then we decided to go back to the bar and sit and talk. And we talked . . . 'til three or four in the morning. Then we decided we'd better get home, so we went home . . . I came in at . . . around nine-thirty. I walked right into the dining room, and there is all of these napkins laying all over the floor. And I just couldn't believe it. I said, "What the heck happened?" . . . I figured it wasn't vandalism, because they would have took chairs and pushed 'em all over the place . . . Just the napkins were on the floor . . . The silverware was all placed on the tables. The flowers were on the tables. Everything was ready, but the napkins were on the floor . . . Nobody was around . . . The front doors are always locked . . . We go through the side—we have a lock there, and that locks, and our back doors are all locked. The place was completely locked. You know, from five to nine—who would be here from five to nine? . . . The wedding was around a hundred and some people, so there was around a hundred and some napkins on the floor . . . I just went to work and put 'em back up and I had no answer.

A former maître d' who had worked at the restaurant from 1974-80 reported a number of unusual occurrences. He had been hired as a teenager, and he gradually worked his way up—bussing tables, parking cars, waiting on tables—until he was promoted to maître d'. He recalls:

> Oh, you always heard banging on the walls, like creaking in the walls, lights flickering, the glasses shaking, wind—cold gusts of wind going past you real fast. It happened so often that we just—we eventually took it for granted. We just shrugged it off.

Late one evening, he experienced an auditory phenomenon that impressed him a great deal. According to his account, customers lingering at the bar also heard the sounds and discussed them with him afterwards. (He was, however, unable to recall the customers' names or provide any information that would permit M.C.M. to interview them.) The maître d' reports:

> I heard footsteps, just as if somebody was walking down the entire length of the bar, all the way down. And the people sitting in the bar stools felt the boards moving. And I was facing the direction that . . . the footsteps were going down. And I did not see anybody. All I heard were the footsteps. I heard them loud and clear. And they went the entire length of the bar and when they got to the end of the bar they stopped.

Toward the end of his tenure, the maître d' had an experience that disturbed him profoundly. Yet he did not, according to his testimony, seek professional counseling or guidance after it occurred. He remembers:

> At one time I did see—something appeared to me in the kitchen area. I was maître d' at the time . . . We were closing the restaurant up for the night, and I was doing my usual walk through the kitchen to make sure everything was closed up and turned off . . . And as I was coming through to come out one of the exit doors . . . I . . . looked up and sitting on a chest of drawers that we have to . . . keep the bread warm, I saw—just for a split second . . . a head, just sitting there right on top of the [bread warmer]. And it was a very smoky color, as if it was a projection onto a screen or something . . . I only saw it for a second, but I . . . I'll never forget it. It . . . had a very painful expression . . . thin, black, slicked-back hair. His ears stuck out a little bit. He had pencil thin eyebrows and pencil thin mustache. And no neck or anything, just—just a head. That's all I saw . . . He was just sitting there, looking at me.

Despite the vividness of his recollection, the maître d' had, at the time, apparently processed the image preattentively. He recalls:

> It didn't register right away when I saw it . . . I went past it . . . past where I had seen it, and I went out and into the bar area. And the minute I stepped into the bar area, it's like . . . hitting a brick wall. I just stopped in my tracks and . . . they told me I started screaming, saying . . . "I saw a head, I saw it!" . . . The other employees that were there with me in the bar area, they all said, "Uh oh, he saw something. Let's get out of here." And we all packed up and we left. . . . I only saw it for a split second, but I'll never forget it. . . . He seemed like he may have been . . . late forties, early fifties. . . . I know I saw it and I walked past it. . . . And I really don't remember too much between leaving the kitchen and getting into my car . . . Next thing I remembered was that I was in my car and I was still very, very upset. . . It was like shock almost . . . I panicked sort of or spaced out . . . It was a different experience, believe me . . . But it's just like it happened yesterday. I'll never forget the details in that face . . . It was not moving at all. It just sat there, as if somebody had placed it there . . . I don't think it was a figment of my imagination. I don't think it was a mirage. I saw something. I know I did.

The General Wayne Inn's proprietor had several ghostly incidents to report. He had purchased the property in 1970, when he became the sixteenth owner of the inn. Raised in Merion township, he had memories of dining at the inn with his parents in 1937, and, when he came of age, having his first alcoholic beverage at the inn's horseshoe bar. An amateur historian, the owner relished the details of the inn's notable history. He was active in the Lower Merion Historical Society and had been its first vice-president for many years. His attitude toward the disturbances is best summed up by what he referred to as his standard line: "I don't believe in ghosts. I just know they're here."

Although a number of incidents had been reported to him over the years, he dismissed the majority of them as inconsequential. Not so a perplexing occurrence that had happened on a quiet afternoon several years before. While he was in the British Barrack's Dining Room, he and a waiter suddenly heard loud, disruptive sounds issuing from the floor above. When they rushed up the stairs to see what was the matter, they found chairs and tables overturned in the locker room outside the third-floor office. There was no one in the room, and a search of the other third-floor rooms, as well as the office which had been locked,

revealed them to be empty. No rational basis for the overturned furniture was discovered in subsequent conversations with staff members.

The owner had also been impressed when a customer told him that while she was relating the history of the inn to her dinner companions in the Post Office Dining Room, a dinner roll flew from her hand for no apparent reason and bounced forcefully against the wall. The roll came to rest on the floor in the center of the dining room and the woman was certain that what had just occurred could not have happened normally. Regarding some of his employees, the owner was inclined to dismiss ghostly reports as the products of hyperactive imaginations. He gave credence, however, to the report of a bartender who had told him, years before, that he saw the Hessian's ghost in the room at the foot of the cellar steps. The bartender refused to go down to the cellar afterwards, and he asked one of the waiters to fetch liquor supplies when they were needed. (The waiter verified that he had routinely performed this task, but the bartender, who had retired, declined to come forward to be interviewed.)

The ghostly occurrences, according to the owner, were generally innocuous and had no malicious bent. He relates:

> Hundreds of occurrences have happened—some very minor, some more dramatic. Either I've experienced them or somebody's come over and told me about them . . . You take all these little ones like the light bulbs burning out and the front door positively locked . . . at night, and it's unlocked in the morning. That's happened three dozen times . . . Between three and four o'clock in the afternoon, all of these glasses behind me shake for no reason. They have never fallen off or anything like that, but you can hear them and see them moving. And that's went on for months, and then it stopped, and then it went on again . . . It wasn't caused by anything . . . There is no upstairs here. This is a one-story building right here . . . They jiggle and they also tingle when they hit each other . . . The chandelier upstairs in the hall is an antique crystal chandelier, and there are twenty-five long, heavy crystals in a circle. And one crystal almost any time of the day or night would swing back and forth. The other twenty-four did not move. There was no draft. There was no air conditioner hitting it . . . Our customers and help . . . they would stand at the bottom of the steps and watch it because it happened all the time.

During the winter of 1978, the owner was contacted by a professional medium. She told him she wanted to visit the inn because she had heard there was "a lot of energy" on the premises. Although she claimed to charge substantial sums for psychic readings, she did not ask the owner to compensate her for investigating the inn. When she arrived with three companions, she requested to see the basement and the owner escorted her down the rickety cellar steps. She began running her hands over the decrepit walls, and when he asked what she was doing, she told him that she was looking for "cool" spots. The owner left the basement to attend to his duties on the main floor. After about three hours, the medium emerged from the cellar and announced that the inn had more than one ghost. "In fact," she told him, "it has quite a few." On February 13, 1978, she returned with several other psychics to conduct a séance in the George Washington Bedchamber Dining Room, which was located on the second floor. The owner recalls closing each of the two doors to the room before the séance started. He relates:

> There were five psychics or six, I don't remember. And four of my family—my wife and two of my sons . . . And when they were ready to start, the leader asked the entities who would like to speak to us, to now enter. There was no one in the building . . . Doors were locked. We were closed. And there were two doors and both of them opened by themselves. We were all seated. There was no one in the building. That was very dramatic . . . That was the first time I really experienced watching something move. And it definitely moved.

The owner's eldest son, a lawyer who worked for a prestigious law firm in Philadelphia, attended the 1978 séance. Although he had not previously believed in ghosts, he recalled that the séance room abruptly chilled for no apparent reason. He also believed that he saw more than one apparitional face appear over the medium's face. He volunteered that a partner in his law firm had recently confided an experience that occurred at the inn about ten years earlier. His colleague told him that when he went to the coat-check

room to retrieve his coat, he was accosted suddenly by a "black apparition" that grabbed hold of his hand and tried to pull him to the ground. He said he struggled with the apparition in an attempt to get his hand free, and that he had genuinely believed that if he were pulled to the ground, he would have been killed. (Because the colleague's disclosure had been related in confidence, and because he told the owner's son that in the intervening decade he had told no one but his wife about the experience, his privacy was respected and he was not sought for an interview.)

The proprietor's younger son, who served as the inn's general manager, did not remember witnessing anything remarkable at the séance. Although acquainted with the inn's ghostly lore, he reported that he had not personally experienced anything unusual on the premises. The proprietor's wife was reticent on the subject of the séance. However, she volunteered that on afternoons when she helped out with accounting in the third-floor office, she sometimes found that the adding machine would repeatedly be off by fifty or a hundred dollars when she added the day's receipts. She would check the machine by quickly adding "two plus two." If the device summed the numbers to "five," she would scold the ghosts (whom she referred to as "the guys") and order them out of the room, telling them that she had work to do. Afterwards, she said, the adding machine would resume working normally.

A parade of entities was reportedly observed by the medium at the 1978 séance, and she deduced that there were seventeen ghosts occupying the inn. The owner—impressed by what he believed to be an unaccountable opening of the north and west doors of the séance room—accepted the medium's count apparently without any reservations. Afterwards, he adopted the guise of a benevolent observer of the ghostly occurrences, an attitude he has maintained ever since. He comments:

> You never know what they're going to do, and you never know how long they're going to do it. Like the glasses . . . the glasses are still going on. The chandelier is still going on. It hasn't done it lately, but over the years it . . . did it very regularly for a long period of time, like every day. But now you'll only see it maybe once every three or four or six months . . . I enjoy these ghosts. I mean, they don't bother me at all . . . I think they come up with some real clever little things.

When asked to describe additional ghostly experiences, especially those in which he was personally involved, the owner recalled:

> A lot of things . . . happen around here . . . when there's snow on the ground . . . This particular day it was snowing hard, and we only sold three lunches which, in a four-hundred-seat restaurant, is not very profitable . . . and I said to the chef, "What are you doing?" And he said, "I have this stainless steel cleaner and I'm cleaning the kitchen" . . . And I said, "I think we should close right now." I think it's the only time I closed because of weather. And he had a whole stack of turkish towels—hand towel size—on the butcher block . . . He had used some of them, but there were probably twenty of them left that he hadn't used yet. And I said, "Well look, the kitchen's clean. Let's all go home while we can still go home." And he put on his hat and coat, and we all walked out the door at two o'clock in the afternoon. We are closed for dinner. We came back at approximately the same time the next day—ten o'clock or so. And those towels have been distributed—thrown all over the kitchen.

The owner's report—reminiscent of the waiter's account of wedding napkins that had been strewn about the dining room—suggested the possibility that a habitual miscreant might have access to the inn at times when the owner and others were away from the premises. Another incident reinforced the suggestion of an intruder. One evening, the medium amused the owner by suggesting that he leave a tape recorder running on the bar's fireplace mantel when he locked up for the night. He adopted her suggestion, and when he reviewed the tape on the following morning, the first half an hour passed uneventfully, as he had anticipated. However, he was suddenly startled to hear sounds on the tape that were familiar. He heard bar chairs scraping as if being pulled up to the bar and the sound of water being turned on and splashing into one of the bar's two sinks (he could tell which one because of its distinctive sound). Finally, he heard the

sounds of liquid being poured into a glass. After the "glug, glug, glug" of the liquid, there were no more sounds on the tape. He could not remember whether the tape had come to an end and the tape recorder had simply shut itself off or whether, instead, the tape had continued to run for awhile without recording any sounds. (When M.C.M. asked to hear the tape, the owner said he had no idea what had become of it and didn't believe it was in his possession anymore.)

The hypothesis of a nocturnal ne'er-do-well, who surreptitiously let himself into the bar after it had been locked up for the night, was also implied by a bizarre occurrence that was discovered on the morning after an election day, when the bar had been officially closed. The owner recalls:

> I came in here as usual about eleven o'clock, and I looked—happened to glance at the cash register behind the bar . . . the drawers were open, and when I glanced at it, it looked like the cash drawer was filled with a whole lot of little mirrors where the nickels and dimes and what have you [go] . . . And I thought that was very strange. So I went around and opened the cash register drawer. Well, it never occurred to me that . . . the cash register was filled with water. It was filled right to the brim with water. And when I yanked the thing open, the water went all down my trousers and I became very wet.
>
> So I'm trying to figure out what happened. This is—this part of the building is a one-story building. And I thought, maybe the roof leaked. But I knew it had not rained the night before. It was as dry as could be. Now, what caused it? I don't know what caused it. But I tried the register and it would not work. So I called the cash register company and they came around and said it was shorted out and has to go back to the shop. So they took the register away and they told me it was going to be five hundred dollars to fix it.
>
> So I called my insurance company. And they sent an adjuster around. He said, "What happened?" And I said, "I don't know what happened." And he said, "How did the water get in the drawer?" He said, "You probably had a leak in the roof." I said, "I don't think so, but maybe." He said, "Do you mind if I look at the roof?" I said, "Not at all." And he goes up. And he comes down and he says, "I don't think your roof leaked." I said, "I don't think so either." He said, "How did the water get in the drawer?" "I don't know." And he said, "I am going to recommend to the—my company that you—that they not pay you." So I said, "Well, look. I pay an awful lot of insurance around here, and I think you should pay the bill." I think there was some kind of an arrangement there—maybe paid half or whatever it was.
>
> But what I didn't tell him, because he really wouldn't have believed me . . . was that in addition to the water being in the drawer of the cash register right to the brim, that across the other side of the bar there were thirty wine carafes . . . half carafes and full carafes and every one of them were filled to the brim with water . . . I also did not tell the adjuster that . . . I noticed on the shelves right above the register, there were thirty, forty glasses up there also filled to the brim with water. I also noticed that the speed rack [a rack holding frequently used bottles of alcohol] which has got to be twelve feet long and . . . four inches wide, was also filled with water.

Despite his out-of-pocket expenses, the proprietor appeared more amused than chagrined by the occurrence. The insurance adjuster "never did put the cause down because no one knew what it was," he concluded cheerfully. The owner did not regard vandalism as a credible hypothesis because no past or present employee, or neighbor, was ever identified as a plausible perpetrator; nor was a miscreant ever detected or caught red-handed by himself or members of his staff. He maintained that many of the ghostly occurrences, such as the glasses rattling and the chandelier crystal swinging, could not have been caused by human agency. Moreover, he reasoned, "Who would take—even a prankster wouldn't take the time to fill up all those carafes with water."

When asked to disclose his own theory regarding the ghostly occurrences, the proprietor volunteered, "Well, I certainly believe that there's something going on. It's just very interesting and I know other people don't have these things." Although he did not advertise the ghosts and said he did not discuss them much with customers, he clearly derived vicarious pleasure from observing what he regarded as amusing ghostly antics. He recalls:

> Another interesting episode that lasted for quite a while—quite a few months—was that when we get busy at the bar . . . the girls would end up on all the bar stools . . . and that would be thirteen, fourteen, fifteen girls sitting there . . . And because of the lack of additional seating, the guys all stand right behind their wife, girlfriend, whatever. And at ten, eleven o'clock at night one of our entities . . . will go down and . . . blow on the back of [a girl's] neck. And the girl will turn around and say to her boyfriend . . . "What did you do that for?" And the next minute, you'd see him [blow] down the next one, and the . . . next girl would do the same thing. All the way down the bar . . . And the poor guys—they really were doing nothing except listening to the music and maybe drinking their beer or whatever they were drinking. And it was very interesting. And the first time I saw it I couldn't believe it . . . It would take him a half an hour to go from one end of the bar to the other end . . . And I would purposely position myself so I could see if it was going to happen again—this blowing on the back of the girls' necks scene. Because it's a funny scene . . . I knew when the first one started that it would continue all the way down to the end of the bar. It always did.

One incident was purportedly witnessed en masse by numerous patrons and it impressed the owner perhaps more than any other single event. (He was not, however, able to recall the names or identities of specific customers that had been present that evening, and M.C.M. was consequently unable to corroborate his account in follow-up interviews.) He remembers:

> A local television station, just before Halloween, sent a crew over here . . . because they had heard about our ghosts . . . And they were here the entire day . . . We were rather crowded [when the show aired] and we made an announcement over our PA system . . . saying that our portion of this TV show is going to be on, and if anybody would like to look at it they could. And the television was in the bar. And the television worked perfectly . . . both before and after this incident . . . When the announcer said that we were going to the General Wayne Inn in Merion, PA . . . as soon as he showed the first scene of the inside of this building . . . the whole picture started to go very, very slowly clockwise, all the way around. And all fifty people in the bar were looking at this and wondering what was going on . . . And the whole thing just kept going around completely, and came back up to straight again, and kept right on going again until our portion was over . . . And everybody's looking at each other. What happened? Now, I inquired that night to see if anybody else saw the show . . . [at] home or somewhere. . . . We were the only one that got this action. . . . And it never did that before, and it never did it afterwards, and no one else in the whole neighborhood had it that way.

A male medium contacted the owner in 1985 and disclosed that the dead Hessian soldier had visited him in a dream. The soldier, he said, was not at peace; he was tormented because he had not received a proper burial, and he wanted the medium to locate his remains so that he could be buried in a dignified manner. Accordingly, the medium asked the owner if he could dig in the cellar in an area where the soldier had indicated he was buried. Because the man claimed that he worked as a building contractor, and since he was willing to provide his own equipment and expenses, the owner allowed him to begin excavating along the cellar's southernmost wall. Work proceeded for several months but although a couple of unidentified bones were encountered, and an old root cellar was unearthed, no recognizable human skeleton was found. Nor was a secret passageway discovered. The enterprise was halted when it was brought to the owner's attention that the digging—which had proceeded south below the cellar wall and for a good distance beyond—threatened to collapse a substantial portion of the parking lot.

## METHOD

### *Participants*

*Experimental Assistant:*
T.C. was a writer interested in the experimental investigation of haunted locations. She agreed to conduct sensitives and controls on a tour of the reportedly haunted premises while "blind" to what had been described by witnesses.

*Sensitives:*
Three females who believed themselves capable of sensing ghosts, if any were present, agreed to participate in an experiment at an ostensibly haunted site. P.R. earned her living as a professional psychic. L.S. was an artist whose prior account of witnessing an apparition had prompted an earlier investigation. M.K. was a photographer whose anecdotal reports of psi experiences had led M.C.M. to suspect that she may possess greater than average psychic sensitivity.

*Controls:*
Three males who were skeptically disposed towards the possibility of sensing ghosts agreed to participate in an experiment. J.M. and A.C. were members of an international magical society devoted to the pursuit of arcane truths through magical rituals. T.D. owned his own computer company and was skeptical of all paranormal claims.

*Photographers:*
L.S. and M.K. were accomplished photographers. Both agreed to take photographs with infrared film at the ostensibly haunted location.

*Psychologist:*
G.R.S. was a psychologist with expertise in both parapsychology and personality. She agreed to evaluate percipients' projective psychological tests while she was "blind" to what they had reported.

*Test Materials*

*Floor Plan Test.*
Each floor-plan set contained five pages that depicted the cellar, main floor, second floor, third floor, and fourth floor of the General Wayne Inn in Merion, Pennsylvania. The floor-plan set had a cover sheet with instructions. Sensitives were asked to make a tour of the premises and mark with an "X" on the floor plan any location where they felt the presence of a ghost. Controls were asked to mark an "X" at locations where they believed someone credulous might report a ghost.

*Checklist Test.*
A four-page checklist contained 35 items that briefly described characteristics of disturbances that had been reported at the inn and 63 descriptive items that did not resemble the ghostly phenomena reported by witnesses. Each description checklist had a cover sheet with instructions. Sensitives were asked to circle items they believed to be true for the ghost (or ghosts) and to cross out items they did not believe were true. If they were uncertain about an item, they were instructed not to respond to it. Controls were asked to circle items they thought a credulous person might report, and to cross out items they did not think anyone would have reported. If controls were uncertain about how to mark an item, they were instructed not to respond to it.

*House Tree Person/Person Test.*
The reader is referred to Maher and Hansen (1995, p. 36) for a description of the projective psychological drawing test that was administered to three witnesses in the present investigation. The test has been used in several investigations of ostensibly haunted locations (Maher & Schmeidler, 1975; Rogo, 1982, Maher & Hansen, 1992; 1995, 1997).

*Test Equipment*

*Electromagnetic Tests.*
A TriField Alphalab Electromagnetic Pollution Meter (manufactured and sold by Tools for Exploration in San Rafael, California) was used to measure electromagnetic-field strengths in milligauss at 38 experimental sites. M.C.M. noted the meter readings and sites on a copy of the floor plan.

*Photography Tests.*
L.S. used a Kodak Wratten Filter No. 89B and Kodak High Speed B&W Infrared Film (HIE 135-36 #2481) with a Nikon camera (50mm lens) and tripod to make eight photographs of sites at the inn. M.K. used a different Nikon camera with the same type of lens, film, and filter to make 24 photographs of the premises. The photographers developed the infrared film and made prints from the negatives in their respective darkrooms. M.C.M. used a Polaroid SX-70 Land Camera with Polaroid film and flashbulb attachment to make 68 Polaroid tests at experimental sites.

*Video Tests.*
Video tests were made by M.C.M. at twelve sites with a Sony AV-3400 Videocorder equipped with a Sony AC-3400 Power Adaptor and Sony AVC-3450 portable video camera. The camera was fitted with a Neuvocon tube for recording in low light levels. Sony ½ inch, B&W, reel-to-reel, ½ hour videotapes were used. The camera was usually mounted on a Sony VCT 20A Elevator Tripod, but the Videocorder was also equipped with a three-hour battery pack for mobility in handheld recording.

*Audio Tests.*
Tests were made by M.C.M. at three locations with a Sony Electro-Voice 635 omnidirectional microphone and Sony cassette tape recorder using a 90-minute TDK High Bias audiocassette tape.

*Procedure*

Planning and preparation for the investigation took place in New York City. M.C.M. gathered equipment and materials, and recruited participants for an experiment with sensitives and controls. She advised each recruit that when the experimental tests were over, a TV crew that would be documenting the investigation would likely ask them to reenact their participation in the experiment. If they consented, they would be required to sign a commercial consent form or "release" so that the film could be aired on TV. Beyond that, participants were told only that on the evening of August 25th, they would be escorted to a location outside New York City, where they would remain overnight. They were asked to be ready to leave their homes by 7:30 P.M., and told that they would receive a telephone call about that time that would provide them with further instructions. All participants graciously agreed to the stipulations required for their participation.

The inn's owner sent M.C.M. architectural blueprints of the inn's main and second floors, as well as a photograph showing the southern face of the building and his own hand-drawn sketches of the basement, first floor, and second floor. With the aid of these materials, an architect drew up floor plans to scale on transparent mylar drafting film that showed the basement, main floor, second floor, and third floor of the premises. Each floor was depicted on a separate page and photocopies of the floor-plan set were made for use in the investigation. M.C.M. prepared written instructions that differed slightly for sensitives and controls.

M.C.M. interviewed the inn's proprietor over the telephone. Based on the information he provided, as well as on supplementary materials sent by a film-company researcher, M.C.M. devised a description checklist that contained 100 brief descriptions of ghostly disturbances. The items were read over the

telephone to the proprietor who agreed that some items depicted ghostly activity reported at the inn, while others did not. The items were randomized and photocopies of the resulting four-page checklist were made for use in the experiment. M.C.M. prepared cover sheets with instructions that differed slightly for sensitives and controls. In a subsequent conversation with the owner, M.C.M. learned that he had changed his mind about two of the descriptive items. He now regarded them as equivocal, and he could not say whether they were true or false. Since responses to the two items could not be evaluated, M.C.M. determined that any responses to these items would not be included in the analysis.

The on-site investigation took place from August 25th to September 1st. M.C.M. took the 1:00 P.M. train from New York to Philadelphia and was met at the station by the TV segment director, who drove her to the inn. When they arrived, M.C.M. discovered that partitioning of the basement and third floor, as well as the construction of a fourth-floor storage room at the rear of the building (which had not been visible in the photograph) required necessary modification of the floor-plan set. Therefore, she altered the architect's basement and third-floor mylar plans to show the partitioned rooms, and created a new floor-plan page on transparent mylar drafting film that depicted the fourth-floor attic room, drawn to scale. (The architect had supplied her with fresh mylar sheets in case they should be needed.) Photocopies were made at a nearby facility, and the floor-plan sets were reconfigured to contain the new and modified pages.

Because the inn operated as a tavern and restaurant, it was not possible to begin the experiment until the establishment closed for the night and employees had vacated the premises. During the evening, M.C.M. telephoned the experimental assistant in New York City. The assistant was requested to contact the two sensitives who lived in Manhattan and make arrangements to meet them at Penn Station. She was asked to purchase tickets and escort them to Philadelphia on the 8:20 P.M. train. (Her expenses for the tickets were reimbursed when she arrived in Philadelphia.) The third sensitive, who lived outside New York City, preferred to drive to the experimental location. She was contacted and instructed to meet the experimental entourage at 9:30 P.M. at the Philadelphia General Station. The control participants were also contacted, but they were instructed to take the 9:30 P.M. train from Penn Station to Philadelphia. The staggering of arrival times for sensitives and controls was intended to keep the two groups separated, and to preclude an idle interval of waiting, for the controls, before they could begin the tests.

M.C.M. and the director met the participants at the train station at the appointed hour. M.C.M. then accompanied the travelers, in the sensitive's car, to a nearby restaurant for refreshments and a brief period of relaxation before the tests began. The director remained at the station to meet the control participants. When M.C.M. arrived at the inn with the experimental entourage, she learned that the proprietor, who had gone away on a day trip, had not yet returned. This forced a delay in the onset of the experiment, because he was in sole possession of keys that were needed to unlock several rooms. M.C.M. remained outside the inn with the participants until the owner returned. When the director arrived and learned of the delay, she took the controls to a hotel where overnight accommodations had been arranged so they could relax in their rooms until their participation was required.

The owner returned shortly thereafter to unlock the rooms. After he and his remaining staff vacated the premises and drove away, M.C.M. entered the inn and made a tour to insure that everything was in order and that lights in the rooms were turned on. The assistant also made a tour of the premises to acquaint herself with the rooms as they related to the floor-plan set. M.C.M. invited the sensitives to decide amongst themselves what their order of participation would be. The first sensitive entered the inn while the other two sensitives remained outside the premises with M.C.M.

The assistant provided the sensitive with a floor-plan set attached to a clipboard, and a copy of the written instructions. The assistant's duties included accompanying participants to insure that each visited

all of the rooms and other areas depicted on the floor plans. She was instructed to offer assistance if any confusion with respect to the floor plans occurred or if an unforeseen accident or emergency arose. Otherwise, she was asked to remain unobtrusively behind participants so as not to disturb their deliberations. When the first sensitive had completed her responses to the floor plan, the assistant escorted her to a small lounge on an enclosed porch. No disturbances had been reported in the lounge, and it was designated as an experimenter's area and was not included in the floor-plan test. The sensitive gave her floor-plan set to the assistant, who provided her with the forms and written instructions for the checklist test. While she completed the test, the second sensitive began her tour of the premises. Because of the long delay, when the second sensitive reached the upper floors of the inn, the assistant came downstairs to start the third sensitive on a tour of the inn. Each of the sensitives completed the checklist test in turn, and were subsequently interviewed by M.C.M. who recorded their anecdotal impressions of the haunting.

Because of the lateness of the hour, the control participants, when brought to the inn by the director, were asked to each choose a different floor on which to begin touring the premises so that they might do so concurrently. M.C.M., the director, and the sensitives remained outside the inn. One of the control participants, after examining the basement and other floors of the inn, declared that there was no ghost and refused to respond to the floor-plan and checklist tests. When the other two controls had completed their tests, the assistant gave the test materials to M.C.M., who locked them in her briefcase. The director subsequently drove the assistant, the three control participants, and one sensitive to the hotel.

M.C.M. gave each of the two remaining sensitives a roll of B&W high-speed infrared film, and asked them to make photographs at any site where they sensed the presence of a ghost. L.S. began by photographing the main stairs where the hostess had reported an apparition, while M.K. went upstairs to photograph the George Washington Bedchamber Dining Room, where the séance had been held. She returned shortly to request another roll of film because she believed she had loaded the first one improperly. When L.S. finished photographing the locations that interested her, she had difficulty unloading the film from her camera. She reported that the camera had inexplicably "jammed" in the middle of rewinding the film, and that when she finally opened it to see what was the matter, she had found a jumble of film inside. When the sensitives were ready to leave, M.C.M. telephoned the manager, as had been prearranged, who returned to lock up. The two sensitives and M.C.M. then drove to the hotel in the sensitive's car.

On the following night, M.C.M. went to the inn at approximately 11:30 P.M. with video equipment. The proprietor was there, and M.C.M. asked him to document his account of the disturbances by responding to the items on the checklist and marking the relevant locations on a floor plan. After the proprietor had finished his floor-plan and checklist responses, M.C.M. made video tests, ranging from five to twenty minutes, at ten sites. Approximately six hours were spent at the inn.

M.C.M. returned to the inn the next night to continue testing. She made tests with Polaroid film at various site locations, and two sound tests with a tape recorder at sites in the basement and on the second floor. At approximately 3:30 A.M., M.C.M. set the portable tape recorder on the fireplace mantle in the bar. After the tape recorder was activated, M.C.M. left the inn, locking the door behind her.

From August 29-31, M.C.M. tape-recorded the interviews with witnesses that were conducted by the director and simultaneously filmed by a TV production crew. When it did not interfere with filming, M.C.M. conducted supplementary interviews and recorded them on videotape. She made additional tests with Polaroid film and administered House-Tree-Person/Person psychological tests to three witnesses who agreed to be tested. The test responses were sent to G.R.S. who did a preliminary analysis and subsequently added more details. On August 31st two of the sensitives returned to Philadelphia to reenact their

participation in the experiment for the TV cameras. On October 15, 1993, M.C.M. returned to the inn and collected electromagnetic-field data. She also made 40 additional Polaroid tests on this occasion.

## RESULTS

### *Floor Plan Test Results*

Table 1 presents the results of sensitives and controls on the floor-plan test. As can be seen in the table, one sensitive's location responses showed significant correspondence to the sites of disturbances reported by witnesses ($p = .026$). Sensitives combined responses showed suggestive similarity to the witnesses' reports ($p = .084$). No control's location responses resembled the reports of witnesses and the combined responses of controls also showed no similarity to the locations of the disturbances.

### *Checklist Test Results*

Results for sensitives and controls on the checklist test are displayed in Table 2. The checklist responses of one sensitive were suggestively similar to the witnesses' descriptions of the phenomena ($p = .059$), but sensitives' combined responses were not significantly or suggestively related to the witnesses' reports ($p = .111$). No control's responses to the checklist were significant, and the controls' combined checklist responses did not show any correspondence to characteristics of the phenomena reported by witnesses.

### *Electromagnetic Test Results*

A total of 173 electromagnetic-field readings were taken at the inn. Target-site readings ranged from 1 milligauss to 30 milligauss while those at control sites ranged from 1 milligauss to 100 milligauss. Electromagnetic-field strengths at target and control sites were compared with Mann-Whitney Rank Sum Tests using peak values, mean values, and all measured values. No significant differences were found.

Table 1
FLOOR PLAN RESULTS OF SENSITIVES AND CONTROLS

| | Target Resp-Y | Control Resp-Y | Target Resp-N | Control Resp-N | Fisher Exact Probabilitz |
|---|---|---|---|---|---|
| Sensitives | | | | | |
| PR | 3 | 4 | 11 | 27 | .3742 |
| MK | 3 | 0 | 11 | 31 | .0256 |
| LS | 3 | 6 | 11 | 25 | .5826 |
| Combined | | *p= .0844* | | | |
| Controls | | | | | |
| JM | 2 | 4 | 12 | 27 | .6176 |
| AC | 1 | 5 | 13 | 26 | .9096 |
| Combined | | *p= .7902* | | | |

Table 2
CHECKLIST RESULTS OF SENSITIVES AND CONTROLS

| | Target Resp-Y | Control Resp-Y | Target Resp-N | Control Resp-N | Fisher Exact Probabilitz |
|---|---|---|---|---|---|
| Sensitives | | | | | |
| PR | 23 | 38 | 12 | 25 | .3770 |
| MK | 5 | 6 | 1 | 11 | .0595 |
| LS | 18 | 31 | 13 | 29 | .3608 |
| Combined | | *p= .1109* | | | |
| Controls | | | | | |
| JM | 9 | 13 | 12 | 29 | .2551 |
| AC | 21 | 36 | 13 | 26 | .4476 |
| Combined | | *p= .2491* | | | |

*Photography Test Results*

Infrared photographs taken by one of the sensitives (L.S.) contained conspicuous light streaks that ran across four of the eight prints. The photographs and negatives were shown to a photography expert. He determined that the camera had been opened in the vicinity of a light source before the film inside had been completely rewound onto the spool. His analysis corresponded with the sensitive's prior report of experiencing a camera "jam" that forced her to manually rewind film that had become tangled inside. Since the anomalous effects had been satisfactorily explained, no further expert opinion was solicited.

*Projective Test Results*

Projective-test drawings were evaluated by G.R.S. who mailed her comments to M.C.M. One set of drawings prompted G.R.S. to describe the respondent as "highly competent," "well organized," and "careful about detail." G.R.S. saw no indications of exceptional ESP ability in the drawings, and she believed the respondent to be someone "not open to inner impressions" who "likes to be realistic." She commented, "Nothing here suggests a poltergeist focus; orderliness is too important to her."

A male witness was evaluated as "realistic," "masculine," and a "four-square type of person" but one who was "not fussy about details." G.R.S. wrote: "I'd expect any unusual report he gave to be worth attention as having a basis in fact, though I'd not necessarily accept his interpretation of it." Indications of "strong aggressive tendencies not overtly recognized" and "not under conscious control," as well as a house drawn with "gaps at its base through which anything might enter," led G.R.S. to suggest that he might be a source of poltergeist activity. However, based on his projective-test responses, G.R.S. would not, she wrote, "dismiss what he said as pathology or fantasy."

The third set of drawings suggested to G.R.S. that the respondent was a "weak, unhappy, immature" person who "denies that his life truly represents him." The test responses implied "withdrawal from the real world and from thinking things through." The drawings further indicated to G.R.S. that the respondent "feels not only incomplete but grotesquely unbalanced." She commented, "His view of women is so unrealistic as to hint at schizophrenia." Although she judged the individual to be "open to inner impressions, perhaps in an unhealthy, fantasizing way," she cautioned, "If he reported an apparition, I'd suspect pathology."

## DISCUSSION

The field researcher faces a special challenge. Confronted with a morass of seemingly chaotic phenomena, can order and precision—so germane to the goals of science—be imposed without obfuscating the nature of the phenomena under consideration? The present case, with its array of diverse features, illustrates the problem. Reports of apparitions, footsteps, doors opening spontaneously, sudden gusts of cold air vie for coherent explanation alongside descriptions of electrical and electronic malfunctions, furniture and objects being overturned or strewn about, glasses rattling in cupboards, and water appearing in the most unlikely places.

Some may prefer to dispose of the enigma by maintaining that there is nothing in the percipients' reports that demands a paranormal interpretation. Indeed, some of the disturbances might be explained by positing that a nocturnal miscreant—someone with a key, perhaps a past or present employee—habitually entered the inn after-hours to gain access to the liquor supply. The perpetrator, if sufficiently imaginative (or deranged) might have left behind bizarre indications of ghostly activity to divert suspicion and avoid detection. Yet the owner, who had occasion to enter the inn when it was closed, never encountered such a person. There is no evidence to support the premise of a miscreant save the disturbances themselves.

Other reports, with more or less difficulty, can also be explained without invoking ghostly enterprise. It is conceivable that employees who were engaged in a violent (but whispered) dispute overturned chairs and tables in the locker room—an open area at the top of the stairs to the third floor—and then quickly left the area. But it is not possible that the hypothetical culprits fled by means of the only third-floor exit, because they would have encountered the owner who rushed up the stairs as soon as the loud, disruptive sounds were heard. A search found no one in the third-floor rooms or on the exposed stairway leading to the attic. The perpetrators could not have hidden in the attic storage room because it was kept locked.

There is possible merit in the conjecture that conventional vibrations and/or electrical problems may account for some of the reports. A building nearly three centuries old is likely to be more vulnerable than modern structures to vibrations caused by drilling and the like. (Indeed, according to the owner, vibrations from a jackhammer in the street had caused an antique glass pane stored on the third floor to shatter years before.) A cupboard suspended from the ceiling, or a crystal hung more delicately than its neighbors, might have been set into motion by subtle vibrations, even if they originated at a source at some distance from the property. Or perhaps deteriorated electrical wiring played an unknown role in the disturbances. The owner's wife, for a period of time, went to the third-floor office at about three in the afternoon and turned on the photocopier, and adding machine. The timing of her actions corresponded suggestively with the time at which glasses in the cabinet were observed to begin shaking—that is, after the lunch session was over and employees were relaxing in the bar. But if vibrations caused by the inn's equipment or wiring were implicated in the phenomenon, it remains to be explained why the spectacle was intermittent and didn't happen every time the equipment was turned on. It is of possible interest that the hostess reported observing an apparition on the main stairs at about the same time of the afternoon, and that the overturned furniture episode also occurred during the normal activity lull in the afternoon.

Regarding apparitions, such reports are routinely dismissed as flights of fancy or hysteria. And in the present case there is reason to believe, based on the results of a projective psychological test, that one percipient's experience may have been modulated by a psychopathological condition. But this does not explain the reports of percipients that didn't exhibit symptoms of psychopathology. It seems unlikely that extensive psychological testing would have detected unbalanced mental states in all of the percipients.

Some may find conventional rationales for the disturbances less than satisfactory, and protest that psi phenomena of all kinds, due to their subtle, borderline nature, are too readily dismissed. And when

scientific tests were administered to sensitive individuals brought to the locale, significant quantitative data were obtained. The sensitives believed themselves able to sense ghosts, and that is what they attempted to do. However, the possibility that their success reflects psi-test ability, and nothing more, cannot be discounted.

But even if we adopt a paranormal hypothesis for the disturbances, the combination of haunting and poltergeist features places a strain on classical interpretation, and theory falters. Apparitions invite a survival hypothesis while poltergeist disturbances do not. If theory is correct, we ought to be able to routinely classify such cases according to dichotomous variables: place-centered or person-centered; long lasting or brief, discarnate agent or one that is living. Yet all too frequently the characteristics associated with haunts commingle with those that have come to be associated with poltergeists.

Nor can the phenomena conveniently be subsumed into one or the other classification. If a classical "ghost" were responsible for the poltergeist-like effects, the revenant would appear to be an RSPK virtuoso. And how do we fit the poltergeist notion of unconscious motivation into the hypothesis of a ghost? An unconscious ghost? A ghost with an id? Attributing the apparitions to a poltergeist focus is no more rational or parsimonious, for it imbues the living agent with remarkable unconscious powers of telepathic hypnosis. To presume that an RSPK agent is unconsciously generating hallucinations in his or her associates strains credulity. Nor could the agent likely simulate the hallucinations fraudulently.

Since the combination of haunting and poltergeist features is the rule rather than the exception in these cases, perhaps it is time to dispense with orthogonal interpretations. Classical theory has failed to make good on its premises. Whatever ghosts and poltergeists may be, it is increasingly apparent that they are facets of the same phenomenon. A productive approach in future research might be to study their similarities rather than focusing on their differences.

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# GAMMA BAND ("40 HZ") EEG AND UNCONSCIOUS TARGET DETECTION IN A PSI TASK

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## ABSTRACT

Electroencephalographic (EEG) activity in the "40 Hz" or gamma band has received much recent attention as a possible neural binding mechanism underlying the establishment of conscious mental states. We presently examined two complementary measures of 40 Hz brain activity in 20 frequent gamblers performing a forced-choice guessing (precognition) task. On each trial, four cards were sequentially presented on a computer monitor; subjects then guessed which card would be the randomly-selected target. The two measures of 40 Hz EEG presently analyzed were: 1) evoked 40 Hz, which is phase-locked to stimulus onset, and 2) induced 40 Hz, which is not phase-locked to the stimulus. Both of these measures generally showed more 40 Hz ($p < .05$) following the presentation of target cards than following nontarget cards. The analysis of evoked 40 Hz activity partially replicated a previous finding from this laboratory which also indicated greater evoked 40 Hz power for psi targets than for nontarget decoys ($p < .005$). The present analysis suggested additionally that several induced 40 Hz power maxima, which we explored on a post-hoc basis, may also differ between targets and nontargets. The possible relationship of 40 Hz brain activity to conscious and unconscious psi is discussed.

## INTRODUCTION

In recent years, there have been an increasing number of published studies reporting physiological evidence of psi anomalies involving both the central and the autonomic nervous system (for reviews, see Beloff, 1974; Warren, McDonough & Don 1992a; Braud, Shafer & Andrews, 1993a; 1993b; Radin, 1996; May, 1997). These findings support the hypothesis proposed by Beloff (1974) that ESP, being largely an unconscious function, may be more detectable in physiological responses than in conscious behaviors, such as overt guesses.

Our laboratory has been engaged in a multi-year program studying psi and event related brain potentials (ERPs). These are minute (microvolt-level) electrical brain responses to time-locked stimuli, which in our experiments are visual stimuli presented on computer screens. We have published the results of a series of four ERP experiments all of which found a differential brain response to computer-presented (and randomly selected) targets compared to nontargets, even though behavior -- guessing accuracy -- was not different from chance performance levels (Warren, McDonough & Don, 1992a; Warren, McDonough & Don, 1992b; Don, McDonough & Warren 1998; McDonough, Warren & Don, 1998). We also examined various possible experimental confounds, which we have also published, further supporting the target vs nontarget differential brain response (McDonough, Don & Warren, 1999). We have called this an unconscious brain response since conscious guessing behavior was not significantly affected. Subsequently, we found in the literature confirmation of this effect in a non-psi experiment, further suggesting its robustness (Paige, Newton, Reese & Dykman, 1987).

A question naturally emerges from these findings: Since the psi information seemed to measurably affect the neocortex of the brain, why did it not enter consciousness? Questions dealing with unconscious, physiological indicators of psi may be related to a topic which is increasingly under study in the neurosciences, what has been called *the binding problem.* That is, the processing by the brain of visual and other sensory information is distributed over spatially separated subpopulations of neurons, each

performing specialized functions, such as computation of edge and line orientation, response to colors, and calculation of motion. How are these separate, specialized processes integrated into a neural representation of one coherent object? In the cognitive neurosciences, the binding question can be similarly expressed in terms of how the independent processing modules of the brain become integrated into coherent memories, perceptions, action plans, and consciousness itself.

Experimental evidence increasingly has come forth suggesting that the binding mechanism is the simultaneous action of „40 Hz“ (30-50 Hz, 30-70 Hz, or "gamma") brain rhythms. The unification of function or binding occurs when there is sufficient 40 Hz activity in the relevant brain subassemblies, especially when these rhythms are in phase. Crick and Koch (1990a, 1990b, 1994) even proposed that 40 Hz activity is the necessary and sufficient condition for *consciousness* in the visual system. More recent work has questioned the sufficiency part of this hypothesis; however, the necessity of 40 Hz activity for the integration of stimulus information – particularly when in phase – is supported by an increasingly large number of studies (for a review see Engel, Fries, König, Brecht & Singer, 1999).

In a previous study (Warren, Don & McDonough,1997), we found more narrow band (36-44 Hz) gamma activity associated with targets than nontargets. The present study attempts to extend those findings to a new subject pool, analyzed by updated methodology but is preliminary in that it is limited to assessing the quantity of 40 Hz power at medial scalp sites and phase coherence among electrodes was not analyzed. If a statistically significant differential in 40 Hz activity in response to target as compared to nontarget stimuli were to be found – in addition to partially replicating our previous 40 Hz findings – then the relevance to parapsychology would be two-fold: 1) It would be yet another physiological indicator of psi; 2) several experimental manipulations should be feasible which may reveal why psi is largely unconscious and what must occur for consciousness of psi information to occur. For example, there may be voltage and/or phase coherence thresholds which must be exceeded for consciousness of psi information to emerge. Also, the topography of 40 Hz activity may be crucial, such as 40 Hz activation of the prefrontal cortex and the consequent connection with short term working memory (Newman & Baars, 1993). It is also possible that psi stimulus information tends to couple directly with subcortical centers, and so remain unconscious. Measurements of these variables may elucidate under what conditions ESP is unconscious or conscious.

## METHODS

### *Subjects*

Twenty (16 male), self-reported, frequent gamblers, i.e., persons who reported gambling at least once per week, were recruited from notices and advertisements for the present experiment. Subjects were in good health (mean age = 27.4 years; range = 18-49) and had normal, or corrected-to-normal, vision. All subjects gave informed consent and were paid $8 per hour for their participation in the experiment. They were also given a $10 "kitty" with which to gamble during the experiment and could keep any money remaining in their kitty at the end of the session, but owed nothing if their account went negative. (As described below, the present study was concerned only with that portion of the data collected under a nongambling control condition.)

### *Stressor Task*

Prior to participating in the gambling task, half of the subjects performed 40 trials of a simple, "low-stress" version, while the other half performed 40 trials of a complex, "high-stress" version of an arithmetic problem-solving task used by Warren & McDonough (1995). Although the subjects in that study could

easily master the simple arithmetic task, they found the complex task to be extremely difficult, frustrating and stressful.

*Guessing Task*

A computerized guessing task was developed, in-house, for this experiment using the Micro Experimental Laboratory (MEL) system. The stimulus set was comprised of a normal deck of fifty-two playing "cards" presented on a computer monitor. On each trial, four playing cards of a given rank were sequentially presented, for example, the four sevens might be presented on one trial (seven of hearts, seven of clubs, seven of spades, and seven of diamonds), the four kings on another, etc. Thus, there were thirteen possible stimulus sets for each trial (two through ace). The four cards presented on each trial were delivered in the center of the video screen in serial order using an interstimulus interval of 2200 ms and a stimulus duration of 150 ms. The card stimuli were presented in actual size and full color (standard deck) against a black background. The target card for each trial was randomly selected from among the alternatives using a pseudorandom algorithm[1]; the remaining three cards in the pack served as nontarget decoys for that trial. The target was selected only after the subject made his/her choice for that trial; that is, all trials were conducted as precognition trials. The set (rank) of card stimuli used on a given trial and the order, or serial position, in which the four cards (1 target and 3 decoys) were presented was also determined randomly.

*Testing Procedure*

Each subject was seated on a comfortable, cushioned chair in a pleasantly decorated testing room with sound-attenuating material on the walls and door to reduce distracting noises. During the experiment, the subject sat alone in the testing room; an intercom permitted communications with an experimenter occupying an adjacent room. The video monitor was located on a table about one meter in front of the subject and at eye level; a keyboard rested in his/her lap.

The testing session comprised 80 trials of the computerized, video-gambling task, which subjects initiated at their own pace by use of the space key on the keyboard. On each trial, subjects were shown four "cards" on a computer monitor. Two and one-half seconds following presentation of the last of four card images, all four cards were displayed on screen together. The subjects then selected one of the cards using the left/right arrow key to move a cursor on the screen and registered their guess using the enter key. The "winning card" was then displayed on the monitor as feedback. The subject's ERPs to the display of the target and the three nontarget decoys were recorded from an array of scalp sites.

There were 40 such trials for each of two conditions. In one condition, subjects played a just-for-fun (nonwager) game; while in the second, the player wagered money (50 cents/trial; each with a $2 possible payoff. In alternating fashion, blocks of 20 trials were conducted with wagering, alternating with blocks of 20 trials with no wagering. Subjects were also counterbalanced to perform the experiment either starting in the wager condition or the nonwager condition. However, the present analyses considered only the 40 trials in the two nonwagering blocks because this condition more closely resembled that of our first two studies where wagering was not a factor, and because the ERP effects reviewed above (see Introduction) were

[1] Random numbers between 1 and 4 were generated by the RRANGE function included in the MEL software (version 1.0), seeded by the pulse count of the system timer. A frequency test on 1000 numbers (between 1 and 4) generated by this function did not indicate significant deviations from randomness, $\chi^2 = 0.296$, *d.f.* = 3, n.s. The serial dependency of the algorithm's output was not tested; However, other calls to this function were interspersed between target selections, i.e., calls to randomly select the next pack of cards to be used and to randomize the presentation order of the cards within the pack. Therefore, it seems extremely unlikely that a serial dependency of the random function's output, even if it existed, could be detected by the subjects.

found only in the nonwagering block of our third study, and were in fact absent for the wager block of trials in that study (we have yet to examine ERPs in the wager block of this, our fourth study).

After every block, a performance summary and the amount of money remaining in their kitty was displayed to the subject on the monitor (target feedback was also presented after each trial). Performance data were output onto a signal channel, recorded on the chart paper of a polygraph, as well as being digitized online, along with EEG, and stored on a computer's hard disk.

*EEG Recording and Data Reduction*

The EEG was recorded continuously while the subjects were performing the video gambling task. Signal pulses on the signal channel permitted later, off-line extraction of EEG epochs associated with delivery of the playing card stimuli. Electrodes were applied over the 19 International 10-20 scalp electrode sites and a forehead ground, using an electrode cap and conducting gel made by Electro-Cap International, Inc.; however, only 9 medial sites were presently analyzed (F3, Fz, F4, C3, Cz, C4, P3, Pz, P4) due to the increased vulnerability of the peripheral recording sites to EMG contamination. Scalp leads were referenced to the left mastoid. Impedances for scalp, ground, and reference electrodes were kept below 5 k ohms. An electrode placed below the right eye, in conjunction with the Fp1 lead located directly above the right eye, was used to monitor eye blinks and movements. The physiological signals were amplified with custom-built Midwest Research Associates DC amplifiers having automatic DC reset capability and a ½ high frequency roll-off at 50 Hz and were digitized on-line at 256 samples per second.

Data editing was performed off-line. EEG epochs containing eye or movement artifacts, or instances where the voltage on any EEG channel exceeded 60 μV, from 100 ms pre-stimulus to 600 ms post-stimulus, were excluded from analysis by a computer-based, automated editing system developed in our lab.

For each subject, event-related band power in the 30-50 Hz frequency range (40 Hz) was computed with the NeuroScan EEG analysis software (ver. 4.1) (Neurosoft, 1999). There are two complementary methods of computing event-related band power. Evoked 40 Hz activity is computed from the spectrum of the average of brain responses which are phase locked to stimulus onset, that is, the averaged evoked response (ERP). However, in addition to the phase locked, evoked band power, there is additional 40 Hz activity elicited by the task stimuli which varies in response latency from the time of stimulus onset. These non-phase locked responses are canceled out in the averaging of the ERP. In order to calculate their effect, the induced 40 Hz activity is calculated on single-trial responses. Identifying the latency from stimulus onset of such induced activity (as seen in the Figure) is accomplished by computing for the selected frequency band, say 40 Hz, the time-varying spectra of a time-moving window of fixed duration, e.g., the Gabor transform (Makeig, 1993) or the Morlet transform (Sinkkonen, Tiitinen, & Näätänen, 1995). When averaged across trials (after first computing power on single trials) these yield the induced 40 Hz, or gamma, response which is the power in the 40 Hz band as a function of time.

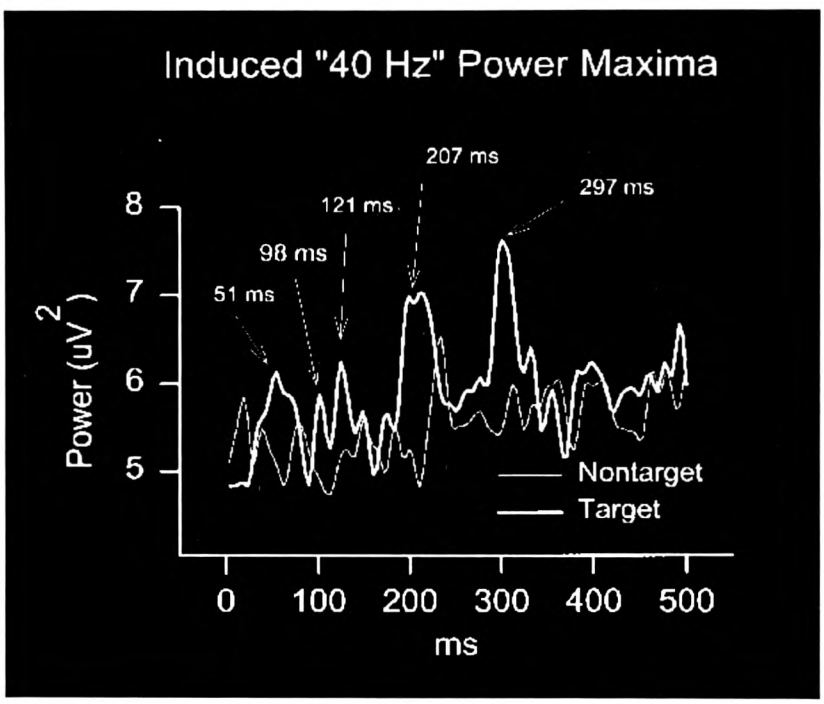
Evoked 40 Hz power was computed on the time-locked average in two latency ranges: 1) 150-400ms, and 2) 400-500ms. These latency ranges were selected, a priori, to correspond with the measurement epochs which we previously examined in our event-related potential (ERP) studies (e.g., Don et al. 1998), measures of brain electrical activity which are also time-locked to stimulus onset.

As described above, induced 40 Hz band power was measured in single EEG epochs as power (microvolts squared) in the latency range 0-500 ms, using a moving window, then averaged over all trials in each stimulus category. Five maxima or peaks appeared to be present in the grand-averaged (across subjects) power profile for induced 40 Hz (See Figure 1). These were identified, post-hoc by visual inspection of the plotted power profile in a frankly exploratory fashion, i.e., all peaks that seemed to stand-

out above the background activity, without advance specification of a given threshold, were considered. They were quantified (on single-subject averages) as the mean power of a 16 ms wide swath centered on the peak latencies as follows: Peak 1, observed at 51 ms; Peak 2, observed at 98 ms; Peak 3, observed at 121 ms; Peak 4, observed at 207 ms; and Peak 5, observed at 297 ms.

FIGURE 1

THE POWER OF 5, SEPARATE, INDUCED 40 HZ PEAKS




Induced „40 Hz" band profile for targets (thick line) and nontargets (thin line) calculated from 0 - 500 ms post-stimulus onset and averaged across all 20 subjects and 9 medial scalp sites. Arrows point to the five analyzed power maxima, or peaks, with labels indicating latency from stimulus onset.

The nontargets used in this analysis were selected from among the three decoys by a random process with the constraint that the number of guessed nontargets equal the number of guessed targets for each subject.[2] We analyzed only one nontarget epoch (out of three) from each trial in order to maintain the same signal-to-noise ratio in nontarget averages as that of the targets, for which there was also only one epoch from each trial. The numbers of epochs included in the target and nontarget categories for single-subject averages ranged from 6 to 34 with a mean (across all twenty subjects) of 19.6 epochs going into each stimulus category.

## RESULTS

### *Guessing Accuracy*

Guessing accuracy in the gambling task did not deviate significantly from mean chance expectation. Collectively, the subjects correctly guessed 204 (27%) targets out of 755 nonwager trials, whereas about 189 correct guesses (25%) would have been expected by chance ($p > .10$, two-tailed exact binomial).[3]

### *Evaluation of 40 Hz Band Power*

Statistical analyses compared 40 Hz band power in the target and nontarget categories, regardless of guessing accuracy, from 9 scalp sites (F3, Fz, F4, C3, Cz, C4, P3, Pz, P4) separately for each measure of evoked and induced activity. These data were analyzed by 3-factor, repeated-measures Analysis of Variance (ANOVA) analysis with two topographic factors, Left-Right (left-hemisphere, midline, right-hemisphere) x Anterior-Posterior (frontal, central, parietal), and the Stimulus-Category factor (target, nontarget), separately for each of the two evoked 40 Hz power measures and five induced 40 Hz peaks power identified in the band power profiles. Only main or interaction effects involving the Stimulus-Category factor, i.e., those relevant to the psi hypothesis are reported here. Main effects of the two topographic factors (Left-Right, Anterior-Posterior), and interactions among these factors, are not presented or discussed since they had no psi relevance. All reported p-values are two-tailed; Huynh-Feldt epsilon factors ($\varepsilon$) for degrees of freedom adjustments were applied where appropriate.

Additionally, an EMG rejection threshold was set at 15 $uV^2$; subjects having 40 Hz power values exceeding this threshold in either stimulus category from any of the nine examined sites were excluded from analysis. Because EMG contamination for any given subject could occur at some latencies while other latencies were free of such contamination, a subject's data may be useable for analyzing some power peaks while unuseable for others. Therefore, the separate ANOVAs on the two evoked and five induced 40 Hz power measures each considered a different number and/or subset of subjects (Numbers of subjects

[2] For every subject, one of the three nontargets presented on each trial was initially selected for analysis as follows: The output of the RAND function from Microsoft C/C++ version 7.0 was scaled to give an integer between 1 and 4. If that number was the same as the target, a new random number was generated. RAND was seeded using the TIME function. After forming the initial nontarget lists, and in order to balance the number of guessed stimuli between the nontarget and target lists for each subject, the initial lists were modified by deleting randomly selected target or nontarget epochs from each subject, as needed, to match the number of guessed stimuli in the target and nontarget lists for that subject. Because the epochs to be deleted were selected after the initial lists were formed by a computer program which did not take into account subjects' guesses, and in order to balance those guesses, a different (manual) randomizing method was used for purposes of balancing. To this end, we used random numbers between 1 and 4 taken from the RAND Table (Rand Corporation, 1985) starting at an arbitrary entry point based on decision rules using the output of a hand calculator's random function.

[3] Because of equipment malfunction, 6 (out of 20) subjects did not receive all 40 nonwager trials; therefore, the numbers of such trials is less than the planned 800 (20 subjects x 40 trials/subject).

remaining after threshold rejection: 20 Ss for both early and late evoked 40 Hz; 17 Ss for induced Peaks 2 and 4; 16 Ss for induced 40 Hz Peaks 3 and 5; and 15 Ss for induced 40 Hz Peak 1).

*Evoked 40 Hz Band Power*

The evoked 40 Hz power was analyzed by 3-factor ANOVAs, separately for early (150-400ms) and late (400-500ms) latency ranges. None of the main effects or interactions involving the Stimulus Category factor were significant for evoked 40 Hz band power in the early latency range (150-40ms), all $p > .10$. On the other hand, there was a significant main effect of Stimulus Category on late (400-500 ms) evoked „40 Hz," with more power for targets (0.61 $uV^2$) than for nontargets (0.42 $uV^2$), $F(1/19) = 9.92$, $p = .005$. The effect size ($f$) of the Stimulus Category main effect was calculated as $f$ = the square root of the quantity ($df$ x F/N) = .25. Here, $df$ = the degrees of freedom of the term in the numerator, or 1 in this example, $F$ = the value of the F-ratio, or 9.92, and $N$ = the total number of repeated measurements, or 40 in this example (20 Ss x 2 Stimulus Categories). Cohen (1988) has categorized .1 as a small effect, .25 as a medium effect, and .4 as a large effect.

*Induced 40 Hz Band Power*

*Induced 40 Hz Peak 1 (51 ms):*
A significant Stimulus Category main effect on the power of the 1st induced 40 Hz peak indicated more power for targets (4.38 $uV^2$) than for nontargets (3.81 $uV^2$), $F(1/14) = 8.54$, $p = .01$. None of the interactions involving the Stimulus Category factor were significant, all $p > .10$. The effect size ($f$) of this Stimulus Category effect on induced 40 Hz power for Peak 1 = .28, a medium-sized effect in Cohen's terminology.

*Induced 40 Hz Peak 2 (98 ms):*
Analyses on the 2nd 40 Hz peak revealed a 3-way, Stimulus Category x Left-Right x Anterior-Posterior, interaction on induced 40 Hz power, $F(4/64) = 2.64$, $p = .05$, $\varepsilon = .85$. This interaction was due to Peak 2 power being between 0.5 to 1 $uV^2$ larger for targets than for nontargets over most of the medial sites except at the right parietal and right central sites where the stimulus category differences were more nearly equal or even slightly reversed in direction. No other Stimulus Category main or interaction effects were observed in the analysis of Peak 2, all $p > .10$.

*Induced 40 Hz Peak 3 (121 ms):*
Analyses on the 3rd 40 Hz peak indicated that none of the Stimulus Category main or interaction effects were significant for Peak 3, all $p > .10$.

*Induced 40 Hz Peak 4 (207 ms):*
Analyses on the 4th 40 Hz peak revealed a significant Stimulus Category main effect, with more 40 Hz power for targets (4.89 $uV^2$) than for nontargets (4.39 $uV^2$), $F(1/16) = 4.58$, $p < .05$. A marginal Stimulus Category x Anterior-Posterior interaction effect suggested that the enhancement of 40 Hz power was more pronounced at centro-parietal sites than at frontal sites, $F(2/32) = 3.10$, $p = .06$. None of the other interaction effects involving Stimulus Category were significant for Peak 4, all $p > .10$.

*Induced 40 Hz Peak 5 (297 ms):*
Analyses on the 5th 40 Hz peak revealed a 3-way, Stimulus Category x Left-Right x Anterior-Posterior, interaction on induced 40 Hz power, $F(4/60) = 3.33$, $p < .05$, $\varepsilon = .54$. This interaction was due to induced 40 Hz being up to ½ $uV^2$ larger for targets relative to nontargets, especially over the left central site, but

also including left and midline parietal sites as well as the right frontal site. As also seen for Peak 2, the 40 Hz power of Peak 5 showed a reversal at the right central site of almost ½ $uV^2$. No other Stimulus Category main or interaction effects were observed in the analysis of Peak 5, all $p > .10$.

## DISCUSSION

EEG activity in the „40 Hz" or gamma band has received much recent attention as a possible neural binding mechanism underlying the establishment of conscious mental states, or as a neural correlate of consciousness more generally. We presently examined two complementary measures of 40 Hz brain activity during performance of a forced-choice guessing task. Both of these measures, evoked 40 Hz, and induced 40 Hz, showed differential activity following the presentation of psi targets than following nontarget decoys. Although still preliminary at this stage, these data are interesting because they link psi phenomena to recent findings in neuroscience.

Evoked 40 Hz activity, a measure of 40 Hz EEG which is time-locked to stimulus onset, was seen to be greater in response to targets than to nontargets at 400-500 ms post-stimulus across all medial scalp sites examined. This result partially replicates the findings of Warren et al. 1997 (reviewed in the introduction). The present measure of evoked 40 Hz EEG was conceptually similar to the 40 Hz EEG studied by Warren et al. 1997, and so we generally expected to find more evoked 40 Hz power for targets than for nontargets as first reported in that study. However, the present study was not intended as an exact replication of Warren et al. 1997. Whereas Warren et al. examined 40 Hz power over the entire 150-500 ms latency window, we presently examined it separately for the early, 150-400 ms segment, and the late, 400-500 ms segment. And, as stated above, while evoked 40 Hz power was presently observed to be larger for targets than for nontargets in the later 400-500 ms segment, it did not differ for the earlier 150-400 ms segment. There were also differences between studies in the scalp topography of the observed 40 Hz effect, i.e., the effect was significant over all medial sites presently, but only over some scalp sites previously. On the other hand, Warren et al. examined 40 Hz power over the narrow 36-44 Hz range, whereas we presently examined the broader 30-50 Hz range. Moreover, the two studies also used different computational formulae to calculate power. Given these differences between studies we should not expect an exact replication of results, and even this partial replication supports the hypothesis that (evoked) 40 Hz activity is more closely associated with the processing of psi targets than it is for nontarget decoys.

Induced 40 Hz activity, a measure of 40 Hz EEG which is not time-locked to stimulus onset, was also analyzed. We put forth no hypotheses for our study of induced 40 Hz since, to the best of our knowledge, no one has ever recorded induced 40 Hz activity during a psi task. Therefore, the present study examined induced 40 Hz power in a frankly exploratory fashion. And, because we explored a number of induced 40 Hz peaks without advance specification of precise hypotheses to be tested, and without correction for multiple testing, the probability of one or more of the observed effects being a Type I error is greater than $\alpha = .05$. Our intent was to cast a wide net in searching for the neural correlates of ESP, recognizing that at least some of the observed effects were likely to be spurious.

We presently analyzed 5 induced 40 Hz power maxima, or peaks, that appeared in the 500 ms period following stimulus onset. Four of these peaks were found to differ significantly between the target and nontarget stimuli. The strongest effect was for Peak 1, observed at 51 ms, which we found to be greater across all nine medial scalp sites following delivery of the psi targets than following delivery of the nontargets. Peak 1 is at roughly the same latency as a very early, negative-going, ERP component which was linked to the presentation of psi targets in a previous study using this same experimental paradigm

(Don et al. 1998). Although still early in the information processing stream, the neural volley has already reached the cerebral cortex by 51 ms post-stimulus.

Induced 40 Hz power maxima peaking at 98 ms, 207 ms, and 297 ms, i.e., Peaks 2, 4, & 5, also showed significant main effects or interaction effects involving the stimulus category factor. Peak 2, observed at 98 ms, showed a significant 3-way interaction involving the stimulus category and both topography factors, anterior-posterior, and left-right. Analysis on Peak 5, appearing at 297 ms, also revealed a significant 3-way interaction between stimulus category and the two topography factors. The functional significance of these topographic patterns, if any, is not clear. Analysis of Peak 4, at 207 ms, revealed a main stimulus category effect indicating more induced 40 Hz power for targets than for nontargets across all nine medial sites. However, a marginal interaction with the anterior-posterior factor suggested that the enhancement of 40 Hz power for targets was more pronounced over central and parietal scalp than over frontal scalp. This is interesting because Peak 4 occurs at about the same latency as the P200 component of the visual ERP, which is also dominant over centro-parietal scalp, and which may therefore be related to the concurrent appearance of the 40 Hz power maximum in some as yet unknown way.

What might the differential 40 Hz power presently observed for targets and nontargets tell us about ESP? Given the recent research findings indicating that 40 Hz brain activity is enhanced during attentive processing, the presently observed 40 Hz effect suggests that our subjects may have been more attentive to the psi targets than they were to the nontarget decoys. Converging evidence that subjects may have allocated more attention to targets than to nontargets comes from our ERP studies showing a larger amplitude negative slow wave following delivery of target than of nontarget stimuli (Warren et al. 1992a; 1992b; Don et al. 1998; McDonough et al. 1998). This negative slow wave was also interpreted as attention-related, possibly reflecting a processing negativity, a measure of selective attention (e.g., Näätänen and Michie, 1979), or akin to the N400/N300 family of ERP negativities which are related to the processing of semantically incongruous or mismatching stimuli (Kutas and Hillyard,1980;1984: Holcomb, 1988; Barrett and Rugg, 1990; Holcomb and McPherson, 1994; McPherson and Holcomb, 1999). On the other hand, the differential processing of target and nontarget stimuli was apparently not enough to influence overt behavior. With a hit rate of only 27%, our subjects overt guesses did not differ significantly from the mean chance expectation of a 25% hit rate. Thus, perhaps the differential EEG effects (both present 40 Hz and previous negative slow wave) should be regarded as reflecting more of a pre-attentive process than a conscious allocation of attention.

This naturally leads to the question of what value is ESP to the organism or species if it is largely unconscious or has no significant effect on behavior? Evolutionary theory would suggest that ESP must have some survival value, or at least once did, else why did it arise? Thus, there must be some way in which psi information is (sometimes) brought to consciousness or affects behavior. It is likely that the sheer quantity of 40 Hz activity is not sufficient to produce a conscious percept, other factors such as the specific site of the enhanced 40 Hz activity, or coherence among disparate brain regions, may also be involved. Future study of 40 Hz activity comparing psi task performance with and without conscious target detection (as indicated by overt guessing behavior), including coherence measures, and the study of crucial brain subsystems such as the prefrontal cortex, may shed further light on the neural mechanisms underlying conscious and unconscious psi target detection.

One problem in studying high-frequency EEG activity (above 30 Hz) is the difficulty excluding EMG contamination from muscles about the face, head, and neck. EMG typically has center frequencies above 80 Hz, but its lower tail reaches well below 30 Hz and can be a significant source of artifact in the 30 - 50 Hz region. In order to mitigate the EMG problem, we presently restricted the 40 Hz analyses to the nine

medial scalp sites and used an EMG threshold for excluding potentially contaminated data from analysis. We also note that, since at the time of stimulus delivery our subjects had no normal means of knowing which stimuli were targets and which were nontargets, the appearance of EMG should have been unbiased with respect to stimulus category, i.e., there is no reason to expect more muscle tension following the delivery of target than of nontarget stimuli. Therefore, we regard EMG contamination as an unlikely explanation for the observed results.

Finally, because a majority of neuroscientists today espouse psychoneural identity theory, a philosophical position which denies the efficacy of consciousness, and who thereby also have little sympathy for parapsychology, it is appropriate to say a few words here in defense of the minority opinion, i.e., against the epiphenomenalist or materialist viewpoint. For one, physical causation is always imperfect or incomplete, for example, there is always some degree of randomness following from quantum indeterminacy or chaos theory, and this 'looseness of fit' may allow room for consciousness to influence the brain without violating physical law (For an elaboration of this argument, see Hodgson, 1994). Second, the mere fact that there exist correlations between mental events and brain events does nothing to indicate the direction of causation and so cannot be considered to unambiguously support the epiphenomenalist identity thesis. That is, the observation of mind-brain correlations is also consistent with the opposing view that conscious (or unconscious) mental events may sometimes influence the physical brain rather than only the other way around. While identity theory, a variant of materialism, does not necessarily preclude the existence of ESP phenomena, other philosophically permissible solutions to the mind-body problem, such as interactionist dualism, or idealism, which view consciousness as efficacious and having an existence separate from (not reducible to) that of matter, would seem more amenable to the possibility of ESP. On this later view, it is perhaps not so farfetched to wonder whether immaterial mind might sometimes slip past the physical barriers of space and time.

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# CONFLICTIVE PSI EXPERIENCES: A SURVEY WITH IMPLICATIONS FOR CLINICAL PARAPSYCHOLOGY[1]

Daniel Gómez Montanelli & Alejandro Parra


## ABSTRACT

Surveys have been one of the most valuable research instruments for studying the psychological and social dimensions of parapsychology. Surveys seem to show that there is a high prevalence of spontaneous experiences in the general population. The present report explores in a descriptive way the incidence of conflict produced by spontaneous psi experiences. Two-hundred and sixty Argentineans participated in our study, 58.8% women and 41.2% men (Mean age= 44.65; SD= 14.26). Most of the participants were interested in parapsychology and in psi phenomena. Using questionnaires we determined the type and frequency of their psi experiences, and if the experiences were conflictive or traumatic for them. We found that over a third of the sample had had a psi experience such as a precognitive dream or a telepathic perception. Two thirds said they had RSPK disturbances and more than half claimed healing abilities. Near death experiences and possession were considered to be conflictive or traumatic by over a third of the sample. A third of the respondents consulted family members, friends and acquaintances, while over a fourth of the sample consulted a physician. We believe that these experiences mark a process of personal growth and of a sense of connection with the world. The experiences may be a healthy response to a hostile and alienating environment or context. Further analyses of the introspective accounts may give us more information about the experiencer's emotional reactions to their psi experiences. In a future report we will present statistical analyses of the interaction between these variables.


## INTRODUCTION

For some individuals psychic or parapsychological experiences seem to produce or to be related to high levels of anxiety or fear. For these individuals a psychotherapeutic approach may be necessary.

Every parapsychology research institute receives calls for help regarding psychic experiences. Nonetheless, not all the institutes are prepared to provide clinical help. There also seems to be lack of interest in the study of these problems. An exception is the study of poltergeist phenomena. Roll had suggested that the poltergeist agent suffers from extreme emotional pressure and that they are not capable of containing the pressure in a normal way (e.g., Roll, 1968). However, in recent years there has been an increase in interest to understand parapsychological experiences better from a clinical point of view (Kramer, 1993; Parker, 1993; Harary, 1993).

Still, most of the survey work is not clinically oriented. Most of the work has focused on prevalence, demographics, and general psychological correlates. Some work regarding general psi experiences has been conducted with students (Green, 1966; Haight, 1979; Kennedy, Kanthamani & Palmer, 1994), or with special groups such as children (Hunt, Gervais, Shearing-Johns, Travis, 1992). Other work has focused on specific phenomena such as apparitions (West, 1948) and out-of-body experiences (Alvarado & Zingrone, 1997; Blackmore, 1984; Brelaz de Castro, 1998; Hart, 1954).

John Palmer (1979) conducted a survey of parapsychological experiences that inspired the present survey. More than half of his sample claimed at least one experience. In addition, the experiencers said that the phenomena affected their attitudes towards life and their lifestyles. Kohr (1980), who studied 406

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members of the Association for Research and Enlightment using Palmer's questionnaire, obtained results similar to Palmer's.

L. E. Rhine (1966) noticed that the people that wrote to her with accounts of psychic experiences were worried about their experiences. According to Harary (1993), when someone talks about their spontaneous psi experience, that person is in search of an explanation. People who have had these experiences react in different ways to them. Hastings (1993) has argued that the way in which a person responds to a psi experience is more important than the details of the experience.

Tart and Labore (1985) have suggested that people are anxious about the existence and workings of psi. In their survey many individuals expressed fear that their minds could be invaded by the thoughts of another person. They were also concerned about the ethical and responsible use of ESP to avoid intrusions into people's privacy.

In this stage of our research project we are concerned with a descriptive study of experiences considered to be conflictive by the experiencers. This may include a variety of psychological, physical, social or existential effects or reactions to the experiences. We will present information about the prevalence of: types of spontaneous psi experiences, frequency of experiences, conflictive experiences, type of consultation or treatments sought by the experiencers (neurological, psychiatric, psychotherapeutic, religious, and others). We will also present demographic information about the respondents.

## METHOD

### *Participants*

The sample included both female (58.8%) and male (41.2%) participants, their ages ranged from 17 to 77 years (N= 260; SD= 14.26). Following the epidemiological profile of Argentineans established by the Instituto Nacional de Salud Mental (1999) [National Institute of Mental Health], we divided the sample into six health zones, from which we received replies. These include the Federal Capital and the Province of Buenos Aires, Northwest area, Cuyo, Center, North-east area, and Patagonia. Table 1 presents more details about the demographics.

### *Instrument*

We designed a 51 item self-report questionnaire. From question 1 to 13 each question inquired about: (1) the frequency of each type of experience; and (2) if any of these experiences were considered to be conflictive (that is the physical, psychological, social or existential reaction to the experience).

*Psi experiences* were defined as those experiences in which a person believed he or she had a parapsychological experience, that is, experiences such as extrasensory perception (or anomalous cognition) and psychokinesis (or the influence of mind over matter), including spontaneous psychokinesis (RSPK) and healing through paranormal means.

Table 1
DEMOGRAPHIC VARIABLES OF THE SAMPLE

| | % (N= 260) |
|---|---|
| **Place of Residence** | |
| Capital Federal and Province of Buenos Aires | 84.4 |
| NOA | 5.0 |
| Cuyo | 2.7 |
| Centro | 5.0 |
| NEA | 2.3 |
| Patagonia | 0.8 |
| **Sex** | |
| Male | 41.2 |
| Female | 58.8 |
| **Age** | |
| 18-25 | 11.8 |
| 26-35 | 16.7 |
| 36-55 | 47.9 |
| 56-65 | 15.2 |
| 66 and older | 8.4 |
| **Education (Highest level)** | |
| Grade School | 6.9 |
| High School | 53.4 |
| Some college | 23.3 |
| Post-graduate | 16.4 |
| **Occupation** | |
| Business | 14.1 |
| Professional (Bachelor Degree) | 15.6 |
| Professional (Advanced degree) | 11.5 |
| Employee | 30.2 |
| Housewife | 7.6 |
| Retired | 5.7 |
| Technical | 5.7 |
| Student | 9.5 |
| **Religion** | |
| Catholic | 55.9 |
| Non-denominational Christian | 12.7 |
| Non-denominational | 10.0 |
| Agnostic | 10.9 |
| Eastern philosophy | 4.5 |
| Atheist | 2.3 |
| Protestant | 1.8 |
| Jewish | 1.8 |

*Psi-related experiences* are those that are not necessarily psi processes but that provide the context for the manifestation of parapsychological phenomena. This may include some out-of-body experiences, near-death experiences, past lives recall, and contact with the dead or with extraterrestrial entities. The items of the questionnaire may be classified in 15 categories as follows:

*Precognition in dreams*: This refers to dreams about events that will take place in the future.

*Telepathy*: The experience of perceiving the thoughts of another person not present at the moment.

*Perceptions of lights and/or energy*: The perception of lights or energies around the human body or around objects.

*Out-of-body experiences*: Experiences in which a person feels that their consciousness is separated from their physical body.

*Near-death experiences*: Experiences, usually during a surgical operation or an accident, in which a person has been declared clinically dead and returns with the recollection of events experienced during such trance.

*Past lives recall*: The experience in which a person has recollections of an apparent previous life, that is, the recollection of having being someone else before the present life. These experiences may take place during dreams, meditation, or in other non-ordinary state of consciousness.

*Extraterrestrial/spiritual contacts*: A range of experiences in which a person has had some type of contact –spontaneous or induced– with extraterrestrial beings, spirits, angels, saints (or Mary), or visual apparitions of ghosts that may include other sensory modalities (feelings, smells, being touched) by all kind of entities.

*Mediumship or channeling*: The capacity of receiving and/or transmitting information presumably coming from a spiritual or an extraterrestrial entity.

*Control at a distance–Possession*: The feeling of being controlled or possessed by a spiritual/extraterrestrial entity or a living person not present at the place in question.

*Poltergeist or RSPK*: A series of physical anomalies, malfunctions of electronic equipment, raps and sounds, things burned, and movement of objects usually associated to "agents" or persons around which the phenomena occur. The phenomena are sometimes attributed to spiritual beings or other entities.

*Psychokinesis*: The ability to influence objects (e.g., move them) at will without touching them.

*Healing*: The capacity to heal disease or improve the condition through a parapsychological procedure (this would also include those that practice reiki, qi-gong, laying-on-of-hands, and similar techniques).

*Demographic information*: Includes general demographic information (place of residence, age, sex, education, profession or occupation, and religion).

*Consulted someone in the past*: The person consulted someone or received some type of treatment about their experiences in the past.

*Consulting someone at present*: The person is currently asking for help or counseling from someone, or is receiving some type of treatment because of his experiences.

*Procedure*

A questionnaire about paranormal experiences was published in *Año/Cero*, a popular magazine about all sorts of paranormal experiences and topics. We also mailed questionnaires using lists obtained through parapsychology and transpersonal psychology groups and institutes, including the list of the Instituto de Psicología Paranormal [Institute of Paranormal Psychology], directed by the second author (AP). The latter list is formed of the institute's members and students that have taken courses at the institute. Four thousand questionnaires were distributed during courses, or sent through the mail of through fax, or through the

popular magazine mentioned above. Two hundred and sixty questionnaires were usable for the survey. All the participants said they had at least one type of parapsychological experience, so we did not received any uncompleted questionnaires.

*Analyses*

This paper presents descriptive analyses of the participants' replies to the above mentioned questionnaire. The percentages presented were produced using Simstat 3.5 (Péladeau, 1994).

## RESULTS

Frequency of Psi Experiences and Conflicts. The results for this section appear in Tables 2 and 3:

*Precognition in Dreams.*
The question is: Have you ever had a dream about an event and later found that the event actually took place? (# 1, see Appendix). Dream precognition was reported by 72.3% of the respondents. The experience was found to be conflictive or traumatic by 14.8%.

Table 2
FREQUENCY OF PSI EXPERIENCES AND PSI-RELATED EXPERIENCES (N=260)*

| | Yes, once | Yes, sometimes | Yes, always | TOTAL |
|---|---|---|---|---|
| *Psi-experiences* | | | | |
| ESP Dreams | 35.9 | 47.9 | 16.7 | 72.3 (189) |
| Telepathy | 14.5 | 55.1 | 30.4 | 82.0 (213) |
| Psychokinesis | 50.0 | 34.4 | 15.6 | 12.8 (32) |
| $RSPK_1$(Electromagnetic disturbances) | 37.5 | 45.6 | 16.9 | 51.7 (134) |
| $RSPK_2$(Objects flying / breaking) | 41.2 | 42.9 | 16.0 | 47.3 (119) |
| Psi healing | 22.8 | 34.2 | 43.0 | 56.5 (147) |
| *Psi-related experiences* | | | | |
| Perception of lights / energy | 28.1 | 43.8 | 27.4 | 55.3 (144) |
| Out-of-body experiences | 33.2 | 51.8 | 15.1 | 75.7 (197) |
| Near death experiences | 88.1 | 11.9 | -- | 15.7 (41) |
| Past life recall | 33.7 | 48.1 | 18.2 | 71.1 (185) |
| ETs / spiritual contacts | 28.9 | 47.0 | 24.7 | 75.3 (197) |
| Mediumship or channeling | 28.9 | 31.6 | 39.5 | 28.8 (75) |
| Distance control - possession | 32.8 | 45.4 | 21.8 | 45.0 (117) |

* The results are presented in terms of number of cases and as percentages (in parenthesis).

Table 3
CONFLICTIVE PSI EXPERIENCES AND PSI-RELATED EXPERIENCES (N=260)*

| | Was conflictive | Was not conflictive | Don't know |
|---|---|---|---|
| *Psi-experiences* | | | |
| ESP Dreams | 28 (14.8) | 154 (81.5) | 7 (3.7) |
| Telepathy | 13 (6.1) | 189 (88.7) | 11 (5.2) |
| Psychokinesis | 5 (15.6) | 25 (78.1) | 2 (6.3) |
| $RSPK_1$(Electromagnetic disturbances) | 22 (16.4) | 100 (74.6) | 12 (9.0) |
| $RSPK_2$(Objects flying / breaking) | 22 (18.3) | 88 (73.3) | 10 (8.3) |
| Psi healing | 5 (15.6) | 138 (78.1) | 4 (2.7) |
| *Psi-related experiences* | | | |
| Perception of lights / energy | 16 (11.1) | 124 (86.1) | 4 (2.8) |
| Out-of-body experiences | 28 (14.4) | 161 (82.6) | 6 (3.1) |
| Near death experiences | 14 (34.1) | 24 (58.5) | 3 (7.3) |
| Past life recall | 21 (11.4) | 155 (83.8) | 9 (4.9) |
| ETs / spiritual contacts | 34 (17.3) | 141 (71.8) | 21 (10.7) |
| Mediumship or channeling | 14 (18.7) | 57 (76.0) | 4 (5.3) |
| Distance control - possession | 40 (34.2) | 66 (56.4) | 11 (9.4 |

* The results are presented in terms of number of cases and as percentages (in parenthesis).

*Telepathy*: The question is: *Have you ever had the sensation of perceiving mentally the thoughts of another person, be this a family member, a friend or an acquaintance that was not present at the moment that you perceived the thoughts?* (# 2, see Appendix). This experience was reported by 82% of the participants. Six percent said that this experience was conflictive or traumatic.

*$RSPK_1$*: The question is: *Have you seen abnormalities in the functioning of electrical apparatus, computers, or other equipment that seem to you very strange, and that, as far as you could determine, were not due to normal or natural causes?* (# 10, see Appendix). This was reported by 51.7% of the sample, while 16.4% said that the experience was conflictive or traumatic.

*$RSPK_2$*: The question is: *Have you ever heard blows or found broken or cracked glass, or burned objects without an apparent physical cause?* (# 11, see Appendix). This experience was reported by 47.3% of the participants. 18.3% said the experience was conflictive or traumatic.

*Psychokinesis*: The question is: *Can you move objects mentally, that is, without physical contact?* (# 12, see Appendix). This experience was reported by 12.8% of the sample. For this question, 15.6% said that the experience was conflictive or traumatic.

*Psi Healing*: The question is: *Do you believe that you have a power to cure or heal?* (# 13, see Appendix). This was answered affirmatively by 56.5% of the respondents. Of these, 15.6% said that the experience was conflictive or traumatic.

**PSI-RELATED EXPERIENCES.**

The results also appear in Tables 1 and 2:

*Perception of Lights/Energies*: The question is: *Have you ever seen a light or lights, or fields of energy around the body or part of the body of a person, which, as far as you could determine, was not caused by normal or natural means?* (# 3, see Appendix). This experience was reported by 55.3%, and found to be conflictive or traumatic by 11.1%.

*Out-of-Body Experiences:* The question is: *Have you ever had the experience of feelings outside or far from your physical body, that is, the sensation that your mind, consciousness or spirit was in a different place than your physical body?* (# 4, see Appendix). This was reported by 75.7% of the sample. Of these, 14.4% found the experience conflictive or traumatic.

*Near-Death Experiences:* The question is: *Have you had the experience of being clinically dead and "returned" bringing with you the recollection of what you experienced during that moment?* (# 5, see Appendix). This was answered affirmatively by 15.7% of the participants. The experience was considered conflictive or traumatic by 34.1%.

*Past lives recall*: The question is: *Have you had recollections or experiences that seem to come from a previous life?* (# 6, see Appendix). Experiences of this sort were reported by 71.1% of the sample. The phenomena were considered conflictive or traumatic by 11.4%.

*ETs/Spiritual Contacts*: The question is: *Have you had, while awake, the vivid impression of hearing, smelling, being touched by, or simply a strong sensation of feeling the presence of an entity (a deceased person, a living person not present in the place, an extraterrestrial entity, etc.), an impression that as far as you could determine was not due to any external physical or natural cause?* (# 7, see Appendix). This was reported by 75.3% of the sample. The experience was conflictive or traumatic for 17.3%.

*Mediumship or Channeling*: The question is: *Have you ever had an experience in which you have functioned as a medium or a channel for the manifestation of an entity (a deceased person, an extraterrestrial entity, etc.)?* (# 8, see Appendix). This experience was reported by 28.8% of the sample. The experience was conflictive or traumatic for 18.7%.

*Control at a Distance–Possession*: The question is: *Have you ever felt that you were watched, persecuted, controlled, or possessed by an entity (a deceased person, a living person not present at the place in question, an extraterrestrial entity, etc.)?* This experience was reported by 22.2% of the participants. It was found to be conflictive or traumatic by 34.2%.

*Consulted Someone in the Past – Consulting Someone at Present*: The results in this section appear in Table 4 and Table 5.

*Consulted someone in the past*: The question is: *Assuming some of the above mentioned experiences were conflictive or traumatic to you, did you consult another person (family member, friend or acquaintance) or did you received any type of treatment because of these experiences?* (# 14, see Appendix). This was answered positively by 31.1% of the sample. That is, these persons consulted at least once a parent, a friend or a professional to get advice.

Table 4
RESPONDENTS WHO CONSULTED OR REQUESTED ORIENTATION IN THE PAST (N=102)

| Consultant | N (%) |
|---|---|
| Physician | 21 (20.4) |
| Relative / Friend / Acquaintance | 32 (31.1) |
| Psychologist / Psychiatrist | 10 (7.8) |
| Religious | 8 (7.8) |
| Parapsychologist | 8 (8.7) |
| More than one consultant | 23 (22.3) |

Table 5
RESPONDENTS WHO CONSULTED OR REQUESTED ORIENTATION IN THE PAST (N=40)

| Consultant | N (%) |
|---|---|
| Physician | 12 (26.1) |
| Relative / Friend / Acquaintance | 15 (32.6) |
| Psychologist / Psychiatrist | 5 (10.9) |
| Religious | 3 (6.5) |
| Parapsychologist | 5 (10.9) |
| More than one consultant | 6 (13.0) |

*Consulting Someone at Present:* The question is: *In case that you are having one or various other experiences PRESENTLY, do you feel they are conflictive or traumatic?* [If yes] are you consulting another person (family member, friend or acquaintance) or are you getting any treatment because of the experiences? (# 15 and 16, see Appendix). Regarding both questions, 32.6% said that they were in fact currently consulting someone for help regarding their experiences.

## DISCUSSION

*Psi Experiences and Psi-Related Experiences.* More than a third of our sample has experienced psi phenomena such as telepathy (82.0%) and ESP in dreams (72.3%). Table 6 shows our results in comparison to those of previous studies. Our dream ESP percentage differ slightly from those of Palmer (85%) and Kohr (87%), and are closer to Zangari and Machado's (64%). Other phenomena have similar

Table 6
COMPARISON BETWEEN OUR FINDINGS AND THOSE OF PREVIOUS STUDIES *

| | Palmer | Kohr | Zangari & Machado | Gomez, Montanelli & Parra |
|---|---|---|---|---|
| ESP in dreams | 85 | 87 | 64 | 72 |
| RSPK | 86 | 60 | 17 | 52 |
| OBE | 87 | 72 | 31 | 76 |
| Past life recall | 69 | 85 | 18 | 71 |
| Aura | 87 | 87 | -- | 55 |

* This information is taken from Blackmore (1984), Kohr (1980), Palmer (1979), and Zangari & Machado (1996).

Table 7
FREQUENCY OF PSI EXPERIENCES AND PSI-RELATED EXPERIENCES:
DIFFERENT SUB-SAMPLES (N=260)*

| | Sample A** | Sample B** | Sample C** |
|---|---|---|---|
| *Psi-experiences* | | | |
| ESP Dreams | 72.6 | 72.6 | 63.8 |
| Telepathy | 85.5 | 81.7 | 72.3 |
| Psychokinesis | 12.0 | 12.5 | 8.5 |
| $RSPK_1$(Electromagnetic disturbances) | 59.0 | 52.1 | 38.3 |
| $RSPK_2$(Objects flying / breaking) | 48.7 | 46.4 | 42.6 |
| Psi healing | 58.1 | 58.9 | 53.2 |
| *Psi-related experiences* | | | |
| Perception of lights / energy | 59.0 | 55.1 | 53.2 |
| Out-of-body experiences | 82.1 | 75.3 | 72.3 |
| Near death experiences | 15.4 | 16.0 | 8.5 |
| Past life recall | 71.8 | 70.7 | 66.0 |
| ETs / spiritual contacts | 73.5 | 75.3 | 74.1 |
| Mediumship or channeling | 34.2 | 29.8 | 19.6 |
| Distance control – possession | 45.3 | 44.9 | 40.4 |

*The results are presented in terms of percentages.

** Sample A: Students of parapsychology and/or transpersonal psychology.

**Sample B: Readers of the Spanish popular magazine Ano/Cero

**Sample C: Non-parapsychological respondents

proportions, such as out-of-body experiences and spiritual extraterrestrial contacts (75.7% y 75.3%, respectively). However, the previous surveys have not asked about extraterrestrials, so the results may not be strictly comparable. Regarding out-of-body experiences our percentages are similar to those reported by Kohr (72%), who used a sample of individuals with a high level of interest in spiritual and parapsychological matters.

There was also a high prevalence of the two types of RSPK phenomena (51.7% and 47.3%) and of claimed healing abilities (56.5%). Regarding RSPK, both Palmer (86%) and Kohr (60%) obtained high prevalences of these experiences. In our study, near-death experiences (15.7%) and psychokinesis (12.8%) obtained lower percentages. Regardless of the comparisons, our results show a high prevalence of experiences, something to be expected from a self-selected sample and from the ways the data was collected.

In addition, we have not found significant differences between questionnaires from the popular magazine, from the students, and from parapsychological and/or transpersonal psychological groups.

Conflictive Feelings and Psi Experiences and Psi-Related Experiences. Near-death experiences and the control at a distance-possession experiences were frequently identified as conflictive (34.1% and 34.2%, respectively). In future work we should measure the degree of conflictive feelings for each experience as opposed to a simple yes and no answer. For example, a high degree of conflictive feelings regarding a near-death experience could be associated with a high degree of change in the experiencer's lives regarding values or attitudes, to high anxiety situations (fear of death), or specific critical events in the lives of the experiencers (accidents, surgery).

There are several aspects that should be considered in the evaluation of the conflictive feelings produced by psi experiences. We did not measure the degree of conflict, although we hope to do this later using more clinically meaningful measures. The determination of presence or absence of conflict or trauma is based on self report. Conflict and trauma may be measured better with other instruments, and in relation to clinical concerns.

At the Instituto de Psicología Paranormal we have developed discussion groups for persons that have had these experiences, be they conflictive or not. The purpose of these groups is to give experiencers the opportunity to discuss their experiences and their meaning in a supportive environment.

In our opinion it is very important to conduct more studies about people's reactions to psi and about the defense mechanisms people use to deal with these experiences. An early discussion f the dynamics of these mechanisms was that of Freud (1984). Regarding this, we should remember that some studies have suggested that individual with low defenses have obtained higher ESP scores that individuals with high defenses (Johnson & Haraldsson, 1984).

It is possible that ESP is affected by these defense mechanisms and that this mechanisms are lower during altered states of consciousness. Similarly, the relationship between hypnotic susceptibility and psychodynamic defenses. In terms of cognitive psychology, maybe we are dealing with cognitive processes that regulate he flow of information towards consciousness (Irwin, 1994b).

To further explore these issues, our future study will include correlations of psi experiences with psychological and psychopathological variables. In this way we will be on better grounds to study if the cases with conflict are associated to pathology or maladjustment.

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# HISTORY OF PARAPSYCHOLOGY IN AUSTRIA[1]

## – NOTES FOR A HISTORY OF PARAPSYCHOLOGICAL DEVELOPMENTS IN AUSTRIA –

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**ABSTRACT**

This papers aims at an overview of the Austrian contributions to parapsychology – researchers as well as psychics – during the past 150 years, from the Austrian Empire to the Republic of Austria. The main themes are Baron Reichenbach and the 'Od', Baron Hellenbach and his philosophical concept similar to the later one of du Prel, the Occult Wave after World War I, the era of Great Mediums, the Schneider brothers – in particular Rudi Schneider, perhaps the most important personality ever in physical mediumship –, parapsychology entering Vienna University (K. C. Schneider) and leaving it again, the eventual establishment of the Austrian S.P.R., a short history of the latter, etc. Due to constraint of space those aspects that are believed to be widely known (e.g. the mediumship of Rudi Schneider, which is well covered in Anita Gregory's book) have been kept short in favour of lesser known facets of the history of parapsychology in Austria. On several occasions, the connection of the past to the present is pointed out specifically.

## INTRODUCTION

The year 1848 changed the world. It was the year Karl Marx (together with Friedrich Engels) had *The Communist Manifesto* published in London. It was also the year of revolutions that swept the major part of Europe, a series of republican revolts against the monarchies, taking place in Italy, France, Germany, and the Austrian Empire[2], both in Austria proper and in Hungary. Eventually, they all ended in failure and repression, and were followed by widespread disillusionment among liberals. It was also in 1848 that strange things were reported happening in the home of the Fox family in Hydesville, NY, a poltergeist case that was to become the cradle of modern Spiritism (or 'Spiritualism', as they preferred to call themselves). Thus the same year 1848 became a landmark date for such antithetic philosophical approaches such as Dialectical Materialism and 'Spiritualism'.

Spritism spread to Europe quickly; apart from earlier newspaper reports (in papers published in seaports such as Hamburg where the news from America regarding communication with 'spirits' had arrived first) serious treatment of the issue is found in the early 1850's. Since Spiritism is – besides the occult tradition throughout history, with peaks in the antique world and in the Renaissance, and

[1] Funded by the IGPP, Freiburg, a research project looking into the details of this topic is currently in progress. This support is gratefully acknowledged.

[2] Also in 1848 Francis-Joseph I. ascended the Throne, eventually becoming the longest-reigning monarch ever in history. The Austrian Empire ('Habsburg Empire') was founded in 1804, whereas the 'Holy Roman Empire of German Nation' was declared defunct in 1806. Later, in 1876, the Habsburg Empire was transformed into the twin Austro-Hungarian Monarchy that lasted until the end of the Great War. This paper is dealing with parapsychology within the German speaking countries under the Habsburg Crown, or otherwise with German publications in any of those countries, and – concerning the decades since the First World War – with parapsychology in the Austrian Republic.

Mesmerism[3] – one of the historic sources of today's parapsychology, it makes sense to commence the period under review with the middle of 19th century[4], the heyday of table-turning.

## THE EARLY YEARS

*Ferencz, Count Szápáry*

As early as 1854, a Hungarian nobleman, Ferencz, Count Szápáry (1804-1875), published (in Paris, albeit in German language) a two-volume work by the title 'Table-Moving Somnambulisch-Magnetische Traumdeutung' ('Table-Moving Somnambulistic-Magnetic Interpretation of Dreams')[5]. The Count, strongly interested in 'magnetic healing' (on which he had published in 1845 'Katechismus des Vital-Magnetismus zur leichteren Direction der Laien-Magnetiseure. Zusammengetragen während seiner zehnjährigen magnetische Laufbahn nach Aussagen von Somnambulen und vieler Autoren' ['Catechism of Vital-Magnetism for Easier Direction of Non-professional Magnetists. Compiled during his 10-years' Career according to Statements of Somnambules and Authors'], in 1853 'Magnetisme et magnetotherapie' ['Magnetism and Magnetotherapy'], and several other books), combined elements of a previous era with the new movement of table-turning[6] in a most uncritical way. The 2nd edition of his 'Magnetisme et magnetotherapie' (1854) was augmented with a section on table-moving or, in his own terms, 'gyro-magnetism.'

*Constantin Delhez*

In 1860 a Constantin Delhez, presumably a Belgian national living as a French language teacher in Vienna, imported the Kardecian type of spiritism to Vienna by publishing the first translations of Kardec's works into German ('The Book of Spirits', Vienna and Brno[7], 1863; 'The Spiritism in its Easiest Expression'

[3] Franz Anton Mesmer (1734 – 1815), born in the German province of Suabia, settled in Vienna where he made the basic observations that led him to develop his doctrine of Animal Magnetism (and, by doing so, he even enriched the English language with the verb 'to mesmerize'), before emigrating to Paris. His method is now widely believed to have been more or less the same as what Braid later described as (neurypnology or) hypnotism, yet the ideas underlying his system are still with us and are being studied and discussed under the label of 'subtle energies'. Straight lines of historic development can be traced from Mesmer (through his disciple Puységur) to investigations of clairvoyance during the state of somnambulism, i.e. research in paranormal phenomena as well as investigation of altered states of consciousness. Similarly, lines can be traced from Braid reviewing Mesmerist phenomena through the two French schools of Nancy (Bernheim, Liébault) and Paris (Charcot) to Freud and further to Jung and a host of psychotherapeutical schools. Thus, Mesmer's influence can hardly be overestimated. See the well known works by Ellenberger (1970), Gauld (1992), and Crabtree (1993).

[4] At that point in time the terminology in the field was not yet developed. The word parapsychology was coined by German philosopher Max Dessoir, then still a student, in 1889 in a contribution to the German periodical *Sphinx* (of course with the German ending: *Parapsychologie*), i.e., a few years after the foundation of the Society for Psychical Research (S.P.R.), London, in 1882. For those who are inclined to make a distinction between the notions of Parapsychology and Psychical Research, starting 'Parapsychology' only with J. B. Rhine: this paper is on the latter rather than on the former.

[5] Szapary (1854). I doubt that there was an English translation as well. Tischner, otherwise a very reliable source, merely mentions (Tischner 1960) the existence of such translation yet fails to supply any bibliographical data. I have not been able to trace this English edition myself: there is no such copy in the Library of Congress, the British Library (formerly British Museum), The Bakken Library and Museum, the Tinterow Collection, and the Moody Medical Library (UTMB), nor is mentioned in Harry Price's Short-Title Catalogue 1929/1935.

[6] 'Although Szapary believed animal magnetic influence could account for the movement, he was not as much interested in the movement of the table itself as he was in the 'psychic community' that is formed around the experience.' (Crabtree [1988], #693)

[7] Provincial capital of Moravia, now Czech Republic

Vienna 1864, several editions). Since he was a widower it is likely that he arrived at his spiritist persuasion[8] on the basis of the loss of his wife. He operated a spiritist association (the first such one in Austria) and published – running from 1866 through 1872 – a journal[9] 'Licht des Jenseits oder Blumenlese aus dem Garten des Spiritismus. Eine Zeitschrift für die spiritische Wissenschaft und Lehre.' (Light of the Beyond or a Selection of Flowers from the Garden of Spiritism. A Journal for Spiritist Science and Doctrine.'), that mainly contained spiritualist teachings and trance transcripts. These teachings seem to have been accepted without any questioning as to their source; there is not the slightest critical approach, apparently scientific research was not the issue. Among all these spiritist articles the famous poltergeist case[10] of Swiss citizen Melchior Joller can be found in volume 2, 1867 (pp. 175-189, 205-220, and 240-253).

A frequent contributor to Delhez' journal was Adelma, Baroness Vay de Vaja[11], an automatist and crystal gazer who herself wrote several books[12] on 'spiritualist philosophy'. Later, she played a similar role in the 'Verein Spiriter Forscher' ('Club of Spirit Researchers') founded in Budapest, Hungary, by Adolph Grünhut M.D., who also published a newsletter.

*Baron Reichenbach and the Odylic Force*

In addition to these forerunners of parapsychology one scholar deserves being mentioned though his research resists categorization: German-born Carl Ludwig, Baron Reichenbach (1788 – 1869). A chemist and expert in mining, he discovered Paraffin, Creosote, and some fractions of mineral oil and made a distinguished career in Bohemia's iron producing industry. Shortly after moving to Vienna and acquiring a castle in the vicinity to accommodate his extensive collections of herbs, minerals, and particularly meteorites, and to establish his laboratory, he claimed to have discovered in 1844 a new force which he named 'Od' (the Odylic Force). The effects of this force he believed to be universal (like Mesmer's 'Universal Flood', but unlike Animal Magnetism thought to be bi-polar; his contemporaries[13] used to call his experiments 'magnetic' ones) and could be studied only through the observations of sensitive persons. As this method[14] is open to suggestion and self-delusion, Reichenbach's claimed findings were met with

[8] A curiosity is his small bilingual (German/French) volume 'Alphabet Spirite pour apprendre à être heureux. Spiritisches Alphabet zur Erlernung glücklich zu werden. Erklärt und erläutert durch viele, von hohen Geistern gegebene Mittheilungen.' ('Spiritist Alphabet in Order to Learn Becoming Happy. Illustrated and Illuminated by many Communications from High Spirits.') Vienna 1864.

[9] The only surviving journal that rooted in the period of Animal Magnetism and/or Psychology of Romanticism was Kerner's Magikon which lasted until 1853. Then, in 1865/66, also in Germany, Berthelen published his short-lived journal 'Psyche. Deutsche Zeitschrift für Odwissenschaft und Geisterkunde'. Chronologically, Delhez' 'Light of the Beyond' comes next, for many decades the only periodical in the field in Austria. Only in 1872, in Germany, the 'Spiritistisch-rationalistische Blätter' started, to be transformed two years later into the 'Psychische Studien' ('Psychic Studies') from which eventually emerged the 'Zeitschrift für Parapsychologie' ('Journal for Parapsychology') 1926 – 1934. Later, quite a number of periodicals were published in Germany.

[10] However, case studies are found in the periodicals of the previous era, too (v. Schubert, v. Meyer, Kerner).

[11] Born 1840 as Countess Wurmbrand (+ 1924)

[12] The title of the most famous one 'Geist – Kraft – Stoff' ('Spirit – Force – Matter'), written automatically in 1869 within 36 days, evokes associations to the leading materialist, Büchner's, book 'Kraft und Stoff' ('Matter and Force'). Furthermore, she wrote 'Studien über die Geisterwelt' ('Studies in the Spirit World') 1874, which also contains a number of automatic drawings of by her husband, Ödon von Vay, and several other books.

[13] Reichenbach enjoyed an extensive correspondence with a number of scientific friends, such as Justus von Liebig, Hugo von Mohl, J. Jakob v. Berzelius, Franz Unger, Friedrich Eduard Beneke, Friedrich Wöhler, Samuel Hahnemann, J. F. Baron Jacquin, Hammer-Purgstall, Pückler-Muskau, Littrow, Feuchtersleben, Gustav Theodor Fechner, Purkinje, Johannes Müller, Christian Doppler, Schleiden, Berhard Cotta, Cuvier, and many more. A part of his bequest (including letters exchanged with the above) is found in the archive of the Technical Museum, Vienna.

[14] Being totally insensitive himself, Reichenbach had to rely totally on what he was told by his subjects whom he broke down into three categories: high-, medium- and low-sensitives. After adjusting to *complete* darkness for a period of up to several hours, these sensitives 'saw' an emanation coming from organisms such as plants, likewise from crystals, and from the two poles each of magnets, both

fierce resistance[15] and have never been accepted by later mainstream parapsychology let alone by science. Yet the founder-fathers of the Society for Psychical Research (S.P.R.) took the matter seriously enough to establish a Reichenbach Committee on its own in order to look into his claims. Until the present day, the issue of 'Subtle Energies' remains in discussion. Reichenbach's main publications on this topic are the following books[16]: 'Untersuchungen über die Dynamide des Magnetismus, der Elektricität, der Wärme, des Lichts in ihren Beziehungen zur Lebenskraft' ('Investigations in the Forces of Magnetism, Electricity, Heat, and Light in their Connections to the Vital Force'), 2 vols, and 'Der sensitive Mensch und sein Verhalten zum Ode' ('Sensitive Man and his Behaviour vis-à-vis the Od').

Many of his publications on the 'Od' were re-edited by Friedrich Feerhow[17] in the 1920's, and part of Reichenbach's work was translated into English[18] already during his lifetime.

*Lazar, Baron Hellenbach*

The field of parapsychology proper in Austria may be seen to have started with Lazar, Baron Hellenbach von Paczolay (1827 – 1887[19]). Being a mixture – so typical for the former Austro-Hungarian Monarchy – of German, Hungarian and Slave blood (Hellenbach Castle still is a tourist attraction, albeit a minor one, in Croatia) he was a philosopher, a politician (deputy in the Upper House in the capital city of Vienna[20]), and, after all, a prolific author in *all* of these fields. Being friendly with the German philosopher Carl du Prel, half a generation his junior, and with the astrophysicist Friedrich Zöllner (famous for his theory of four spatial dimensions in conjunction with his experiments with Slade), he succeeded in bringing a number of mediums to Vienna for experiments, including Eglinton, Slade, and Bastian. Hellenbach's and du Prel's philosophical views were related to one another, and it would appear that Hellenbach influenced du Prel. Explanations for paranormal phenomena were sought along the lines of an underlying transcendental substratum – a dualist approach, in its very essence not entirely unlike to the one advocated by John Beloff[21] these days. Yet Hellenbach was critically minded, and was extremely critical of Spiritists whom he called

permanent ones and electromagnets. One of his subjects, Stephan Endlicher who was a good medium-sensitive, happened to be a botanist by profession, he was the director of the Botanical Garden and professor at Vienna University. He was able to classify plants in the dark only by the 'light' he perceived them as emitting themselves. (To discuss the pro and con of Reichenbach's findings and his interpretations is beyond the scope of this historical paper.)

[15] After moving to Vienna he found himself soon integrated into the leading Viennese scientific circles; he played an important role in the plan to offer a chair at Vienna University to Justus von Liebig (who he was quite friendly with) which plan eventually collapsed. However, following his turning towards the study of the 'Od' things changed dramatically: simultaneously his previous luck in technical-economic enterprises deserted him and so did his friends, including v. Liebig. Eventually, Reichenbach ended up as a very isolated elderly man in his huge castle. – He died in Leipzig, Germany, on a journey undertaken to convince some scientists (in particular Fechner) of the existence of the 'Od'.

[16] His further publications on the topic of the Od include: 'Odisch-magnetische Briefe' ('Odylic-Magnetic Letters'), 'Köhlerglaube und Afterweisheit' ('Blind Faith and Pseudo-Wisdom'), 'Wer ist sensitiv, wer nicht?' ('Who is sensitive, who is not?'), 'Die Pflanzenwelt und ihre Beziehung zur Sensitivität und zum Ode' ('The World of Plants and its Relation to Sensitivity and the Od'), 'Aphorismen über Sensitivität und Od' ('Aphorisms on Sensitivity and Od'), 'Die odische Lohe' ('The Odylic Blaze').

[17] Alias name; his real name was Friedrich Wehofer Ph.D., M.D., a Viennese general practitioner who became interested in problems of Animal Magnetism (Durville), the so-called 'N-rays' (which are now considered to have been a delusion due to poor experimentation coupled with overdeveloped imagination), and the Od. Wehofer died in his early thirties from tuberculosis; yet he wrote several books plus the introductions to the a/m reprints he edited. He was critically minded and wrote, besides the topic of 'Od', books on the 'Technique of Fraudulent Phenomena' (Feerhow [1913a]) and on the 'Critique of "Scientific" Spritism' (Feerhow [1912c]).

[18] It is this translation of Reichbach's 'Dynamide' by Gregory, Braids replied to by his 'The Power of the Mind over the body' (1846).

[19] He died from a stroke. Tischner's presumption (Tischner 1960) of Hellenbach possibly having committed suicide is incorrect due to plausible information I could obtain from his descendants.

[20] He resigned in this capacity after the political changes of 1876

[21] Beloff (1989)

gullible. Though primarily a philosopher, he was a keen experimenter as well; in his own experiments with mediums, Hellenbach could witness a number of physical phenomena, including moving of furniture and even levitations. He described his séances with Eglinton in his apartment who managed to draw two pencil markings on the ceiling that was 13 ft high – yet Hellenbach was not entirely convinced that the only explanation was levitation[22] and he discussed alternatives. The a/m series of sittings with Bastian took place in the Imperial Castle in Vienna, with members of the Habsburg Family including the Crown Prince Archduke Rudolph (who later committed a joint suicide[23] with Mary, Baroness Vetsera at Mayerling) being present, in the course of which Bastian was caught in his undergarments between two doors – surely this was no materialization as it had been announced, but opinions were divided as to what *really* happened. Archduke Johann[24] later wrote a brochure[25] claiming blatant fraud, Hellenbach contradicted in a brochure pointing out that the intention of the medium to achieve materialization has led him that far that he – unconsciously – acted out this intention himself[26]. Thus, the two camps opposing one other throughout the entire history of physical mediumship, if not parapsychology in general could clearly be identified as early as at that point in time. Hellenbach was also interested in the history of alchemy and several other topics that could be summarized as anomalistics rather than parapsychology. Hellenbach wrote a great number of books and papers in our field, the most prominent book titles being[27]: 'Eine Philosophie des gesunden Menschenverstandes' ('A Philosophy of Sober Common Sense'), 'Die Vorurtheile der Menschheit' ('The Prejudices of Man') 3 vols, 'Ist Hansen[28] ein Schwindler?' ('Is Hansen a Fraud?'), 'Die Logik der Thatsachen. Eine Entgegnung auf die Brochure „Einblicke in den Spiritismus." [Von Erzherzog Johann.]' ('The Logic of the Facts. A Reply to the brochure "Insights into Spiritism." [By Archduke John])', 'Geburt und Tod als Wechsel der Anschauungsformen oder die Doppel-Natur des Menschen' ('Birth and Death as Change of Modes of Perception or the Double-Nature of Man').

*'Wissenschaftlicher Verein für Okkultismus in Wien'*

Just before the turn of the century, a grouping called 'Wissenschaftlicher Verein für Okkultismus in Wien' ('Scientific Society for Occultism[29] in Vienna') was established under the directorship of August P. Eder

[22] In this context, Hellenbach also quotes an analogue experiment of an earlier era: a levitation experiment carried out by a 'mystic' Schindler that has taken place in the Imperial Castle in Vienna during the reign (1740 – 1780) of the Empress, Marie Therese, organized and witnessed by her husband, Francis Stephan. It is interesting that these ostensible phenomena have attracted the attention of members of the Imperial Family; the testimony for this case, however, is poor. Hellenbach (1879/80a), vol. 3, p. 232.

[23] From some sources it would appear that his mother, the Empress Elisabeth (better known – from the movies – as 'Sisi' or [wrongly] 'Sissy') was a devout believer in spiritism; she might have become so due to the tragic loss of her son and heir to the Crown. However, her spiritism was a sort of faith and lacked any critical analysis of possible sources of the phenomena.

[24] Archduke Johann (John) was a colourful personality who later resigned his rights in the Imperial House for his love and subsequent marriage with a common girl; he adopted the name of Johann Orth and eventually emigrated to South America.

[25] Einblicke in den Spiritismus. (Insights into Spiritism). Von Erzherzog Johann. Linz 1884

[26] Hellenbach (1884). It might be of interest to note that similar positions were also expressed in relation to Florence Cook in 1874, and unconscious cheating (in that case provoked by undeveloped spirits) attributed to the Davenports in 1862.

[27] Other titles of books by Hellenbach are: 'Mr. Slade's Aufenthalt in Wien' ('Mr. Slade's Stay in Vienna'), 'Der Individualismus im Lichte der Biologie und Philosophie der Gegenwart' ('Individualism in the Light of Contemporary Biology and Philosophy'), 'Die neuesten Kundgebungen einer intelligiblen Welt' ('The newest Manifestations of an Intelligible World'), 'Aus dem Tagebuche eines Philosophen' ('From a Philosopher's Diary'), 'Die Magie der Zahlen als Grundlage aller Mannigfaltigkeit und das scheinbare Fatum' ('The Magic of Numbers as the Basis of all Variety and the Ostensible Fate'). Furthermore, Hellenbach was a frequent contributor to the German periodical 'Sphinx'.

[28] Hansen was a then famous 'magnetist' who gave (semi-)public performances in hypnotic suggestion; Hellenbach's friend, Zöllner, too, has published on his performances.

[29] In those days, the terms 'occult' and 'occultism' did not have that negative connotation like today. It needs to be borne in mind that Rudolf Tischner used that term still in 1950 (Tischner 1950).

and Robert Hielle, the latter apparently the driving force. They published a bi-weekly periodical 'Seelenkunde'[30] that dealt – besides the inevitable trance transcripts – with makro-PK (influence on a compass needle[31], and the phenomena of the then famous medium Anna Rothe[32] who was later exposed as a fraud), with mental phenomena like suggestion, and also with the trance phenomena of Mrs. Piper (translations from the Proceedings of the S.P.R.[33]) and Mme d'Espérance; furthermore they maintained a library. It appears they operated for a period of some five or six years (1899 – 1905).

## Between the Two Wars

It took until after the First World Word that a new wave of public interest in the paranormal arose, i.e. the spiritualist (purported) 'communication with the deceased' due to the enormous loss of lives during the war. From this movement emerged a number of mediums that became subjects for parapsychological research, in the first place the Schneider brothers, born in Braunau am Inn, Upper Austria.

There was another change within the field that gradually took place after the collapse of the monarchy and all the subsequent socio-economic changes: the shift from 'amateur research' (represented mainly by members of the aristocracy) towards more 'professional research', not in the sense of an already established discipline, but by individuals (coming all from the middle classes) who were either professional scientists in their respective fields or had at least undergone university training in various fields.

### *The Early 1920's*

Several of the children of the Schneider family are said to have possessed mediumistic powers of different degrees. Famous, however, became Willy and particularly his younger brother Rudi[34] (1908 – 1957) as these were the ones who subjected themselves to scientific investigation. At that period, Continental European parapsychology was dominated by the superior personality[35] of Munich-based researcher Albert von Schrenck-Notzing, who later devoted one volume each out of his many publications to the phenomena of Willy and to the mediumship of Rudi. In some of these (later) sittings with Willy, Nobel-price winning novelist Thomas Mann took part and described his observations in an essay, moreover he shaped the narration of a séance in his famous novel 'The Magic Mountain' according to what he had witnessed with Willy. During the early 1920's, following a disagreement with Schrenck-Notzing, Willy came to Vienna

[30] See Hielle (1902 - 1904)

[31] The contemporary reports of experiments carried by then famous physiologist Prof. Harnack in Halle, Germany, are discussed at length and compared to Kieser's reports from the 'Archiv für thierischen Magnetismus' ('Archive for Animal Magnetism') from 1818.

[32] Robert Hielle and his wife had taken part in a séance with Anna Rothe in Berlin in Nov. 1901. The report in N°1/1902 of the periodical states quite a number of control measures taken, and subsequently the Hielle couple declare themselves convinced that Anna Rothe's phenomena are genuine.

[33] ProcSPR, Part XVII, Dec. 1890

[34] Gregory (1985)

[35] Schrenck-Notzing (1862 - 1929), a descendant of an impoverished family of lower nobility, became very wealthy only by his marriage to Gabriele Siegle, the heir of a German industry complex (now BASF). Besides his powerful character as such (see Walther [1960]), his dominating influence on the parapsychology of his day was twofold, (i) scientifically by his many publications on experiments with mediums, by improving the methodology, and, last not least, by formulating (together with Ochorowicz, Geley, and Richet) the paradigm of physical mediumism of his day, i.e. telekinesis and materialization are germane, the ideoplastic production of ectoplasm being a preliminary stage of these phenomena, (ii) practically by his financial support of investigations carried out by other researchers and particularly by his financing of the 'Zeitschrift für Parapsychologie' (Journal of Parapsychology) which was continued by his widow until 1934. (Subsequently, when Gabriele, Baroness Schrenck-Notzing resolved to withdraw this subsidy, the 'Zeitschrift für Parapsychologie' was discontinued.) It is not far-fetched to state that he who finances a periodical is able to exert a certain amount of control of what is to be published and what is not.

where his phenomena were investigated by Dr. Holub, a psychiatrist. Materializations were allegedly manifested in addition to the phenomena he usually produced (telekinesis of light objects). Rudi, too, came to Vienna where he first gave séances in the private circle of Czernin-Dierkenau in 1924 where allegedly levitations have been observed. Shortly afterwards, professors Meyer and Przibram, both physicists at the Radium Institute, gave a demonstration how a levitation could be forged[36], their style of debunking not being much different from what is displayed nowadays by Randi. Holub died from a stroke – whether it is true that this happened on reading the news of the (alleged) exposure of Rudi or whether this story was spread in order to create a martyr can no longer be decided. Nevertheless, his widow stuck to Psychical Research[37] and accompanied Willy to London for sittings with members of the S.P.R.. Meanwhile in Vienna, Professor Wettstein[38], then chairman of the Austrian Academy of Sciences, suggested a physicist should look into the matter of physical mediumism – this is how Hans Thirring, chair of Theoretical Physics at the Vienna University, entered the field. It did not take too long until a young man from Munich by the name of Kraus (on whom Schrenck-Notzing later reported[39] using the alias Weber) introduced himself as one of Schrenck's mediums. During the subsequent demonstrations his fraudulent productions were exposed when Countess Wassilko was able to replicate those by 'normal' (as opposed to para-normal) means. So, the Countess – who had, along with psychoanalyst Alfred, Baron Winterstein[40], been a member of the former Czernin-circle since 1924 – had made her entry into scientific Psychical Research as a critically minded investigator. Kraus' exposure lead to a disagreement between Thirring (who took Kraus for a fraud) and Schrenck-Notzing (who maintained that Kraus had produced genuine phenomena but resorted to tricks only when and if not properly controlled – a so-called 'mixed' case): in Schrenck's opinion, Thirring was inexperienced as a psychical researcher whereas Thirring regarded Schrenck for not sufficiently critically minded. Eventually, Countess Wassilko succeeded in informally mediating between Thirring and Schrenck.

*Countess Wassilko*

Zoë, Countess Wassilko-Serecki (1897 – 1978) was later to become the driving force of parapsychology in Austria, she also was the motor for the establishment of an association or society devoted to the investigation of paranormal phenomena. In 1925, she investigated a poltergeist case in the village of Talpa in the Bukowina – which before the First World War used to be the easternmost county of the Austro-Hungarian monarchy[41] – where she happened to have her family roots, and subsequently in 1926 she brought the focus person of this poltergeist case, young Romanian peasant girl Eleonore Zugun, for a period

[36] Schrenck-Notzing pointed out the reasons why he felt that secure about the genuineness of Rudi's levitations, i. e. because of the measures taken for control, particularly the luminous marks on the séance garment and the slippers with luminous soles. 'I could see these luminous soles moving away from one another and coming together again several times as Rudi was straddling and again closing his legs, they were right in front of my eyes, and my height is 1.85 metres.' Schrenck-Notzing, unpublished letter to Countess Wassilko [my translation].

[37] She was also – jointly with Countess Wassilko – on the committee of proponents (1925) to establish a 'Society for Research in Mediums' which proposal eventually was not approved by the authorities. It appears that she bailed out of Psychical Research after this rejection.

[38] Famous botanist. Just a number of years ago, his face was pictured on an Austrian banknote.

[39] Third International Congress for Psychical Research in Paris, 1927. See Schrenck-Notzing (1928)

[40] Winterstein (1885 – 1958) was a disciple of Freud and member of his most intimate circle. Noteworthy is 'Zur Psychoanalyse des Spuks'. ('On the Psychoanalysis of Hauntings') Imago, XII. (1926) 2/3, 434 – 447. As Freud was born in 1856, the 1926-issue was kind of festschrift on his 70th birthday. (Winterstein [1926])

[41] The Bukowina is now divided between Romania and the Ukraine, the border running right through the area where this poltergeist case had originated.

short of two years to Vienna where the girl was investigated[42] by a number of scientists before they went abroad to give demonstrations in London (at Harry Price's 'National Laboratory of Psychical Research') and in various cities in Germany (where an alleged exposure occurred). Recently, I carried out a study[43] re-examining this case and checking on variables that could not have been taken into account at the time of the case.

*Early Institutions – K. C. Schneider*

During the same period, the mid-1920's, two institutions were operating in Vienna, a short-lived 'Kriminal-telepathisches Institut' ('Criminal-telepathic Institute') founded and run by a Dr. Thoma, a lawyer, that tried to exploit ESP for information gathering in the context of crime and law suits, and the more important 'Wiener Parapsychisches Institut' ('Viennese Parapsychical Institute') chaired by Karl Camillo Schneider[44], the executive officer of which was Ubald Tartaruga[45], a police officer and writer. During their few years of operation from 1924 onwards, they held public lectures on 'Xenologie' ('Xenology') and issued, in co-operation with a German publishing house, a number of brochures on various problems of parapsychology[46]. Though their appearance was cheap, most of them were up to the scientific standards of their time. German-born K. C. Schneider[47], a biologist of vitalist persuasion and in this capacity professor at Vienna University, was the first (and – unfortunately – to this day the only one) to read for a few years parapsychology[48] at the University of Vienna[49] commencing in 1926 ('Problems of Parapsychology', 'Psychology of the Occult'). He was, to put it mildly, a very strange character, so the potential reservations vis-à-vis the field of parapsychology were augmented by the strange conduct he displayed, and I believe it is fair to say that in the long run he has – despite his pioneering University lectures – done more harm than good to the field.

*The Austrian S.P.R.*

Eventually, in December, 1927, the 'Austrian Society for Psychical Research' was established in Vienna, in its name following the example of the world's oldest, the British S.P.R.. Hans Thirring was the first one to be elected president, Countess Wassilko became the Honorary Secretary General, an appointment she was to hold for a total of 38 years. The Society has changed its name twice since, in 1971 to 'Austrian Society for Parapsychology', and eventually in 1997 an amendment 'and Border Areas of Science' was added in order to emphasize the interdisciplinary network with neighbouring fields and to recognize the international trend towards integration into (a future discipline) 'Anomalistics'.

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[42] Wassilko-Serecki (1926), Wassilko-Serecki (1927), Wassilko-Serecki (1928)

[43] Mulacz (1999a). Invited address at the Parapsychological Association's 41st Annual Convention. This project has been funded by the IGPP, Freiburg, which is gratefully acknowledged.

[44] Besides Schneider und Tartaruga, the council members were: Prof. Dr. Rudolf Schmid, Prof. Dr. Rudolf Ungar, Prof. Dr. med. et phil. et jur. Ferdinand Winkler, Primarius Dr. med. et phil. Fritz Schulhof, police official Dr. Franz Brandl, Franz Haller M.D., Hugo Glaser M.D., Rudolf Hein, and Anton Missriegler M.D.

[45] Born under the name of Ehrenfreund

[46] See reference section

[47] Born near Leipzig in 1867, Ph. D. (zoology) in Munich, eventually since 1897 at the University of Vienna; retired in 1932.

[48] This was much disputed in his Faculty. He managed to move slowly from his own field (histology) within zoology to animal psychology, further to various aspects of psychology, and eventually to psychology of the occult and to parapsychology. However, it appears – since lectures of his on other subjects met some opposition as well – that it was primarily he and not the field of parapsychology who met this resistance.

[49] During the 1920's, parapsychology was read at several German universities: Messer in Gießen, Oesterreich in Tübingen, Verweyen in Bonn, etc. I have no idea whether these lectures were well attended by students; Schneider's, however, were definitely not, again possibly due to his personality rather than to the field as such.

The decade between the foundation of the Society and Austria's forced 'Anschluss' to the German 'Reich' in 1938 was very fruitful: the Society, being research-oriented[50], was fully integrated into the international parapsychological scene and many of its leading members contributed articles to scientific journals and wrote scholarly books[51]. The main achievements of the Society during this period were twofold: in the field of physical phenomena the investigation of several spontaneous cases, first and foremost the case of poltergeist girl Frieda Weissl (1930/31)[52], and in the field of ESP research tests with various psychics. Particularly one of them, a retired Army captain Gross, obtained very good results. It needs to be borne in mind that during these inter-war years there was an International Committee for Psychical Research Congresses operating, founded and chaired by the Dane Carl Vett. In most of these congresses members of the Austrian S.P.R. and other Austrian parapsychologists took part. So, Countess Wassilko had, half a year prior to the foundation of the Austrian S.P.R., read a paper on the Zugun case[53] in Paris[54], 1927, and during the Congress in Athens, 1930, arrangements were made to further improve the experiments in long distance telepathy started a few years earlier involving Capt Gross in Vienna[55]. In these experiments, Gross, a Ms Elpiniki and others in Athens, and other persons in Budapest, Warsaw, Oslo, and Paris formed sort of 'telepathic network' linking some of the major cities of Europe.

Another activity of the Society – which continues to this day – was educational. Public lectures were organized. Speakers included the most prominent figures of their time, i.e. Swiss psychiatrist Bleuler and German biologist and philosopher Hans Driesch, the only German ever to become at one time the President of the British S.P.R..

*F. V. Schöffel*

Notably, the Society never managed to publish a journal of its own. However, Franz Vinzenz Schöffel (1884 – 1959), a cavalry captain who was, like the majority of Imperial officers, forced by circumstances after the Great War to retire and sought to make a living as a journalist and author, started (back in 1922) a magazine called 'Das Neue Licht' ('The New Light') that was to live[56] until the early 1960's, then edited by his son. Although Schöffel tried hard to have the Society make his periodical its official journal, they declined time and again, as this was a rather popular and in no way a 'scientific' magazine. Yet it provided reliable information on various topics within the field and many of its contributors, such as Gerda Walther, had a good scientific standing.

*Parapsychological Activities in Graz*

During the inter-war period, a short-lived local S.P.R. was established in the provincial capital of Graz (Styria) which needs to mentioned for two reasons. The leading figure there was Daniel Walter[57] who

[50] One of the first activities was an investigation in the phenomena of a 'Bergmann Diebel' who claimed to be able to control physiological phenomena that usually happen involuntary. His demonstrations were not overwhelming.

[51] For example Baron Winterstein, just to mention one. Winterstein served more than one term as president of the Austrian S.P.R., he wrote a book on telepathy and clairvoyance (Winterstein 1937, 1948), and he lectured on parapsychology in adult education ('Urania'). It is interesting that likewise the psychoanalytic movement in Vienna in its early stages – having no chair or even lecturer at the university – resorted to adult education.

[52] Winterstein presented her case at the international congress in Athens: Winterstein (1930)

[53] Wassilko-Serecki (1928)

[54] The only other Austrian contributor at this congress was Wilhelm Wrchovszky.

[55] See Konstantinides (1930)

[56] Interrupted between 1941 and 1946

[57] Walter (1930)

delivered an interesting paper at the International Congress in Athens[58], 1930, on a new methodological approach called 'Comparative Parapsychology' – these methodological suggestions are sound though apparently they did not meet much resonance. Secondly, a famous Austrian medium was living in this area: Maria Silbert (+1936). Her speciality was the engraving on a metal surface, ostensibly by her spirit guide 'Nell'. These 'engravings', which sometimes appeared on enclosed surfaces, such as the inside of the lid of a pocket watch, were rather primitive scratches, not engravings like those done by a professional jeweller; however, as they happened ostensibly far away from the medium's extremities they constitute an interesting phenomenon. In my possession is a lady's cigarette case (bequest of Countess Wassilko) showing such engraved name.

*The Dark Years Austria had Ceased to Exist as a Sovereign Country*

In 1938, Austria was annexed by Nazi Germany (the 'Anschluss'). As the Nuremberg Laws came into effect, the membership of the Austrian S.P.R. decreased considerably. The Austrian S.P.R. was supposed to be merged with a German sister organization, later planes demanded an amalgamation of the Austrian S.P.R. with some local spiritualistic groups in Vienna. As all these plans appeared to be unacceptable to the council of the Austrian S.P.R. they eventually decided to dissolve themselves in order to avoid this unwelcome merger. Thus, the activities of the Austrian S.P.R. as such were interrupted until the end of the 2nd World War. Nevertheless Austrian parapsychologists continued with their research.

*Rudi Schneider and G. A. Schwaiger*

Prof. Gustav Adolf Schwaiger, then the technical director of the Austrian Broadcast Corporation, carried out experiments with Rudi Schneider that started in the late 1930's and continued, despite the War, until the early 1940's, until the laboratory was bombed. In these experiments Schwaiger tried to push things forward starting on the basis of what had been obtained at the IMI. After Schrenck's death in 1929, Rudi has made a distinguished career as one of the world's finest physical mediums and as definitely the most prominent Austrian medium ever, a medium who has never really been exposed (in this quality equalling only D. D. Home). His mediumship was i.a. investigated by Harry Price in London (the latter's so-called exposure cannot be taken too seriously[59], and it is widely accepted that it has done more harm to Price's reputation as a psychical researcher than to Rudi's reputation as a medium). Outstanding, however, and unsurpassed until this day are the experiments carried out by the team of father and son Osty[60] at the IMI (Institute Métapsychique International) in Paris where an infra-red beam – like the ones nowadays used in burglar alarm devices – was interrupted by a 'substance'[61] emerging from the medium's body. Moreover, the absorption of the infra-red beam showed a certain oscillation that was correlated to Rudi's expiration rate (which was tremendously increased during his trance states[62]). Owing to Osty's results, Rudi – though initially the weaker medium compared to his brother Willy whose mediumship had ceased earlier – eventually became the scientifically most important physical medium ever. Schwaiger in his research focussed on investigating that 'substance' and its effects applied then state-of-the-art apparatus, such as remote observation by a TV set. Unfortunately, all apparatus was destroyed by allied bombings. After the

[58] The other Austrian contributors were: Schneider, Winterstein, and Wassilko-Serecki.
[59] See Osty (1933a)
[60] See Osty (1933b)
[61] Without entering a discussion on the existence of ectoplasm or alternative explanations for Osty's 'goal-oriented' results it ought to be pointed out he was aware that there are two aspects to this, and subsequently constantly used the expression 'substance/force' (Osty [1933b]). Thus, when talking about interrupting a beam of light, the 'substance' aspect is in the foreground.
[62] See Mulacz (1991)

termination of Schwaiger's experiments[63] further testing continued at small scale in the private Schickl-circle in Weyer, Upper Austria[64], where Rudi lived with this wife, carrying on until Rudi's untimely death.

## The Period after World War Two

The Austrian Society for Psychical Research was re-established after the war in 1946. However, owing to the shift in paradigm brought along by J. B. Rhine's approach, they could not manage to continue as efficiently as before the break brought about by the Nazi regime and the ensuing war. Since then, emphasis has shifted almost totally from research to educational activities. All prominent figures in post-war parapsychology, provided they have command of the German language, have given lectures. The list includes eminent Dutch parapsychologist W. H. C. Tenhaeff, Czech parapsychologist Milan Rýzl (actually when on transit through Austria departing his home country for the U.S.A. for political reasons), and foremost Hans Bender, founder and director of the IGPP, Freiburg, and once PA president, who was invited regularly for his very well-received talks. The special festive lecture he gave on the occasion of the 50th anniversary of the Society was attended by an audience exceeding 800 persons, including many professors of Vienna's universities, other scholars, and public figures.

In 1966, a major clash occurred during which the two remaining founder-members (Countess Wassilko and Professor Thirring) resigned their membership – as happens so often when a younger generation takes over.

For more than three decades, until 1997, Professor Helmut Hofmann (Institute for Theoretical Foundations of Electrical Engineering, Technical University of Vienna) held the appointment of President of the Society. During his term of office, an electronic device for ESP testing was constructed by one of his students, combining his professional activity in electrical engineering with his interest in parapsychological research. This apparatus from the late 1960's was an early one of its kind, to be followed later by a new development – all that happened before the advent of the PC as an household item. However, the structure of a Scientific Society (note that the Society became a member of the 'Federation of Austrian Scientific Societies' shortly after its re-establishment) did not allow for using this apparatus to carry out large-scale ESP experiments in the style of Rhine due to the lack of human resources. The few results that were obtained during test runs have, albeit looking promising, never been published. Thus, Hofmann had to contain himself with research on ESP along the traditional lines of investigating gifted persons.[65]

## The Aftereffects of Uri Geller's Appearance

In particular it was the publicity of Uri Geller in the 1970's that caused an enormous increase in public interest, as well as prompting some research into the effects of paranormal metal bending. Geller was on a TV-show in Austria during which no effects were achieved by him; however, after the show – still in the TV studio – a key was bent under good observational conditions. Hofmann had this key investigated by experts of the Technical University using state-of-the-art equipment. No traces of any chemical substance could be found on its surface (it will be remembered that there have been suspicions Uri Geller achieved his metal bending by trickery, applying chemical substances on the surface that would weaken it). By

[63] His records are kept in the Schwaiger file at the S.P.R.'s library in Cambridge. Despite all my efforts to investigate this matter, no-one appears to know how they found their way from Vienna to London.

[64] Though this is briefly mentioned in Anita Gregory's book (Gregory 1985), she does not elaborate.

[65] Presently, I am in the process of editing the collected lectures and writings on parapsychology by Hofmann who is retired for more than a decade.

coincidence, I had a chance to observe Geller whom I had not seen for the past ten or so years quite recently, in December 1999, when he still performed the metal bending[66] that had made him world famous. Luckily, the observational conditions in my case were quite good. Furthermore, exactly the same happened as what was reported by Hofmann in the 1970's and numerous times since: the key, placed by Geller on a table, continued bending apparently on its own.

As it happened in many other countries, ostensible phenomena occurred both with clocks and watches, and with pieces of cutlery during the TV show featuring Geller. It needs no emphasizing that these accounts can hardly be corroborated in detail. More important is the fact that in Austria, too, a few persons remained who found out that they could produce similar phenomena, at least for a certain time beyond the period of Gellermania. Most of them were children and youths. I investigated two of them, a boy of 14 years of age and a girl between 7 and 8 (not related to one another, different families in different places). The girl was particularly interesting as I could get some insight in the underlying psychological processes. The primary factor appeared to be her belief system. Thus, she was able to bend a material that in fact was stronger but *appeared* to be the same as the previous one (a double blind experiment, as we checked the strength of material only later and were surprised ourselves by the difference we found). On the other hand, she found herself unable to bend material appearing stronger though in fact it was much weaker[67].

Hofmann investigated one man in whose household ostensible paranormal phenomena have taken place during the Geller show and who apparently retained this 'faculty' which was rather rare with adults. After his motivation was prompted by video tapes of Russian PK-medium Nina Kulagina shown to him he did well in macro-PK experiments. A video tape was shot showing the movement of light objects (Japanese chopsticks) without being touched.

## Other Phenomena

A final phenomenon deserves being mentioned as it attracts many lay people with an interest in parapsychology, if not scientists: Electronic Voice Phenomena (EVP), or, as many prefer, Instrumental Trance Communication (ITC). When the matter came up first, I had the opportunity to investigate a few cases of this purported 'communication'[68]. In the meantime, this matter is entirely in the hands of persons of spiritualist persuasion, mainly elderly who are bereaved and in need of counselling yet not interested in scientific research, and in some cases hostile to such. Thus, research (that deserves this name) in this field has come to an end.

The common denominator of all parapsychological research activities in Austria during the fifty years after the end of the war is that it is all low-budget research, due to limited resources – both financial and human resources.

## The Present and the Future

The aforementioned peak of public interest caused by Geller is long since over, so the focus of the activities of the Austrian Society for Parapsychology and Border Areas of Science – since 1997 chaired by Manfred

[66] To be published in detail soon

[67] For certain reasons, I did not publish these results at that time. Later, I gave my records to the late PA member, Heinz Ch. Berendt, who used it (along with a few photos) in his book on Paranormal Metal Bending (Berendt [1986]).

[68] Ellis, D. J. (1978)

Kremser, Institute of Ethnology, Cultural and Social Anthropology of the University[69] of Vienna – rests again in organizing lectures (ten evenings a year) and in maintaining a library. For the time being, there are some 200 members to the Society and another 200 who are associated.

I feel I should end this look back into history with a look forward into the future: as the Society was established in 1927, it will celebrate its 75th anniversary in the year 2002, and we are all looking forward to this event.

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[69] According to the rules, for maintaining the status of a 'Scientific Society' i.e. membership in the 'Federation of Austrian Scientific Societies' it is mandatory that the president or some council members of such society be affiliated with a university. Of course, not all members or associates are scientists themselves, the majority are lay persons who just share an interest in parapsychology.

[70] List of publications of the series 'Internationale Wiener Parapsychische Bibliothek' ('International Viennese Parapsychical Library'), edited by U. Tartaruga. Pfullingen: Johannes Baum (jointly edited with the series ‚Die okkulte Welt' ['The Occult World'] of the same publisher) [no year]:

1: Tartaruga, U. Aus dem Reiche den Hellsehwunders. Neue retroskopische Versuche. (Miracles of Clairvoyance. New Retroscopic Experiments.)
2: Schneider, C. Die Stellung der heutigen Wissenschaft zu den parapsychischen Phänomenen. (The Relation of Contemporary Science towards Parapsychic Phenomena.)
3: Winkler, F. Gesundung durch Erziehung. Pädagogische Psychogymnastik. Persuasion und Couéismus. (Healing by Education. Pedagogic Psychogymnastics. Persuasion and Couéism.)
4: Mißriegler, A. Psychologie der Suggestion. (The Psychology of Suggestion.)
5: Schmid, R. Das Leuchtvermögen des menschlichen Körpers. (The Luminescence of the Human Body.)
6: Laszky, L. Die magnetischen Kräfte des Menschen und die Praxis des Heilmagnetismus. (The Magnetic Forces of Man and the Practice of Magnetic Healing.)
7: Blacher, C. Die okkulten Tatsachen von der Naturwissenschaft aus betrachtet. (The Occult Facts from the Viewpoint of Science.)
8: Sudre, R. Der Kampf um die Metapsychik. (The Struggle for Parapsychology.)
9: Schulhof, F. Sind Sensitive und Medien Hysteriker? (Sensitives and Mediums – are they Hysterics?)
10: Brandl, F. Der Mensch als kosmische Erscheinung. Die Materialisationsidee im Weltall. (Man as a Cosmic Phenomenon. The Idea of Materialization in the Universe.)
11: Tartaruga, U. Neue Wunder der Hypnose. (New Miracles of Hypnosis.)
12: Wimmer, A. Über Besessenheit. Translated from the Danish by U. Tartaruga. (On Possession.)
13: Tengler, R. Das Du im Ich und das Ich im Du. Mystisches Schauen und Denken. (You in Me and Me in You. Mystical Vision and Thinking.)
14: Grön, F. Wunderkuren. Translated from the Norwegian by U. Tartaruga. (Miraculous Cures.)
15: Schmid, R. Leben und Urzeugung. (Life and Spontaneous Generation.)
16: Finkler, W. Die Wiedergeburt der Teile. Erscheinungen der Regeneration. (The Rebirth of Parts. Phenomena of Regeneration.)
17: Schneider, C. C. Entfaltung des Übersinnlichen aus dem Leben. Biologie und Okkultismus. (The Evolvement of the Supersensual from Life. Biology and Occultism.)

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# JUNGIAN SYNCHRONICITY SHEDS LIGHT ON THE MICRO-PK MECHANISM ?

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**ABSTRACT**

Some seventy years ago C. G. Jung in collaboration with W. Pauli introduced the idea of Synchronicity, to account for meaningful coincidences based on an acausal connecting principle. Within the field of consciousness-related anomalies there have been a number of speculations regarding possible mechanisms by which human agent intention could modulate the statistical outcomes of stochastic processes. In this article we shall present the results of an alternative statistical analysis applied on a large PK-REG database. We shall argue that they imply a subtle Jungian Synchronicity mechanism which acausally connects the individual events into meaningful coincidences.

## 1. INTRODUCTION

Psychokinesis experiments test the hypothesis that human agent intention can "influence" the statistical outcomes of a stochastic source. The generally accepted view of such an influence is one that shifts the average of normally distributed outcomes in prearranged directions. It further implies the presence of a force biasing (loading) the basic individual random event, usually a random bit, mediated by the application of human agent intention. The wider scientific community has received such claims with considerable skepticism to say at the least. Very often the criticism is quite unfair focused on the scientists who dare to consider exploring such avenues. However, the number of eminent scientists who have had interest on parapsychology has not been negligible, as for instance Wolfgang Pauli's interest in parapsychology (Meyenn, 1999). The arguments against the psychokinesis hypothesis are many. Just to mention a few: (a) the experiments do not yield repeatable results. (b) If positive results are reported these constitute very weak effects, (c) If the mind can "influence" physical reality, how can physical constants exist? (d) How can scientific experiments be at all possible? (Jahn & Anderson, 1991). A model, or a theory, of the purported phenomena should seriously take into account such arguments and be able to answer them.

Meta-analyses are the established scientific tools, mainly within the medical and psychological sciences, to decide upon the validity of experimental evidence. One such meta-analysis has confirmed the statistical significance of positive PK evidence across many psychokinesis experimental results (Radin & Nelson, 1989) manifesting as the shift in average of their statistical distribution. The question, which is raised following such evidence, is whether the effect is actually the consequence of some kind of biasing the basic random unit generated in the stochastic process. If true, we surely ignore at present the subtle biasing mechanism behind it. The material world around us seems concrete and insensitive to the effects of volition upon the state of physical reality. The Data Augmentation Theory (DAT) presents a relevant model that comes to a similar conclusion (May et al., 1995). The main claim of this model is in essence that even if an anomalous coupling between the consciousness of an observer and reality exists, this will not alter physical reality at all (i.e. 'parent distribution').

One could perhaps overcome arguments about low PK effect sizes by evaluating the high statistical significance of the effect, but due to the lack of reproducibility the phenomenon is hard to defend. Or, is it not? In this work we shall present PK-REG data forming a large database, which have failed to confirm the

expected hypothesis through the orthodox statistical analysis on the one hand. An alternative statistical analysis applied on these data sequences on the other hand, the rescaled range analysis (R/S), detected effects in some data sequences that correlated with human agent intention. The alternative statistical method also provided an insight regarding the possible mechanism by which human agent intention may couple with the stochastic process. On this point we would like to emphasize that the mechanism need not be paranormal but quite normal, in the sense that it complies with the laws of physics (a task yet unsolved), even if its true nature remains obscure. Let us briefly say at this point that the current results are suggestive of a Jungian synchronicity mechanism underway.

The psychologist Carl Gustav Jung inspired by his connection with the physicist Wolfgang Pauli introduced the idea of synchronicity in relation to the state of human consciousness. Synchronicity is an acausal connecting principle among seemingly unconnected events (Jung, 1952/1972), while these connections appear meaningful to us[1]. Pauli's exclusion principle, which works at the very foundation of how matter is built, is nothing more than an acausal connecting principle between two electron states. In this work we shall argue that the result of the alternative statistical analysis applied on PK-REG data indicate a Jungian synchronous connection binding together the outcomes of the REG process. This connection is indeed meaningful in the sense that the outcomes correlate with the state of consciousness: an overall directed attention to mentally influence the statistical average of the outcomes' distribution.

## 2. EXPERIMENTAL

In this section a description of the machine operation and the conditions for data collection is given. The random event generator (REG) is based on converted Johnson noise in resistors, or so-called thermal noise, which is a quantum level phenomenon that produces a broad white noise Fourier power spectrum from low-amplitude voltage fluctuations. The fluctuations are conditioned by subsequent electronics into a random sequence of positive and negative pulses. The pulse sequence is converted into streams of random bits and each random number generated by the device represents the sum of two hundred of these bits. To eliminate biases that might arise from temperature changes or component ageing, "exclusive or" (XOR) masks are applied to the digital data streams in regularly alternating 1/0 patterns. The numbers thus obtained should be normally distributed about 100 with a standard deviation $sd\left(=\sqrt{\tfrac{1}{2}\times\tfrac{1}{2}\times 200}\right)=7.07$. Further details are found in relevant publications (Atmannspacher et al., 1999; Nelson et al. 1992). The data collection was performed at the Institut für Grenzgebiete der Psychologie und Psychohygiene e.V. (IGPP) by the German team of co-authors of this paper.

The total of REG data analyzed here amounts to one and a half million REG numbers, or $3x10^8$ bits. Of the 1.5 million of data, 450,000 were grouped into one file defined as *experimental raw*, another 450,000 of data were grouped into a second file defined as *control* and the remaining 600,000 data were named *calibration*. Fifteen operators participated as human agents over a series of experimental sessions, each one of them contributing 30,000 numbers (200-bits per trial) in total. According to the experimental protocol, at the end of the day, comprising one or several experimental sessions, there followed the generation of an equal number of 'control' data lacking the introduction of human agent intention as constraint. Finally, in addition to the experimental & control data collections there were long uninterrupted periods of data generation over which the constraint of human agent intention was not introduced. These constituted the

[1] In this paper the term 'synchronicity' is used only under this general description. Any further reference to Jungian 'archetypes' is outside the scope of this work.

calibration data. Calibration data shared therefore the same label with control data as far as the absence in the intention-related condition, but unlike both the experimental and control types they referred to a long uninterrupted machine operation. The 600,000 calibration data were generated, however, over two different data collection sessions; the first one consisted of 500,000 data generated during a break in the course of the experimental sessions and the other 100,000 data were generated after these experimental sessions have ended. The calibration data will therefore be analyzed as two different data files rather than one.

The 'raw' experimental data were further shuffled non-randomly by pooling them in terms of same constraints related to direction of intention sub-conditions. The shortest length of pooling sequence was typically 100 and occasionally 1000 data long, a number that determined the shuffling resolution. Finally, the REG statistics were computer simulated so that the two different random event generation processes, the REG device and the simulated stochastic process were compared under the R/S analysis. The simulated data were therefore normally distributed about 100 with a standard deviation of 7.07. There were six such simulated data sequences generated, each one consisting of 450,000 units.

## 3. THE RESCALED RANGE (R/S) AND ERROR ANALYSIS

### *3.1 The R/S analysis*

The method of the rescaled range statistical analysis (R/S) was developed about fifty years ago by H. E. Hurst and applied on many time series of records of natural phenomena (Hurst, 1951). The basic steps for the application of the R/S technique are the following: step-(a) to introduce a linear transformation on the streams of N raw data $x_i$ (of average $\bar{x}$) according to the relation

$$X_N = \sum_{i=1}^{N} x_i - N\bar{x} \qquad (1)$$

step-(b) to find the range, R, of the transformed data $X_N$ and the standard deviation, S, of the raw data, and finally step-(c) to estimate the R/S ratio, the rescaled range. Hurst showed that the rescaled range of independent events generated by stochastic processes akin to white noise should be proportional to the square root of the number of data

$$R/S \propto \sqrt{N} \qquad (2)$$

Do the electronic noise time series conform to equation (2) to the extent that they are unperturbed by the human agent intention? We know to date that a large number of natural phenomena do not satisfy equation (2) exhibiting long-range correlations for which the rescaled range obeys instead the exponential law

$$R/S \propto N^H \qquad (3)$$

where H is the Hurst exponent. For values of H lying in the interval $0.5<H<1$ or $0<H<0.5$ the time series acquires a fractal character determined as persistent or anti-persistent fBm (fractional Brownian motion), respectively. A value H = 0.5 indicates a time series generated by random independent process.

In the R/S analysis the H exponent is estimated by applying equations 1 & 3 on the original data, $x_i$, and performing a least squares straight line fitting procedure. To do so, the original length of data sequence, $N_t$, is divided into $n$ (non-overlapping) segments, the observation windows, each of size N, so that[2] $N \approx (N_t/n)$ (Feder, 1988). The ratio $(R/S)_n$ is estimated for each of the $n$ fragmented sequences and the

[2] Allowance was made for such integer values of n that yield division residuals between zero and 4.

logarithm of their average, (R/S), is plotted against log N in the so-called Hurst graph, figure 2. An error bar associated with average $(R/S)$ is plotted on the Hurst graph at an appropriate logarithmic scale (for further details see next section). The R/S ratio offers an insight about the way that the units arrange themselves in the data sequence. A large R/S value implies a long run of similar symbols, e.g. a sequence of numbers all lying above (or below) their theoretical average. A low R/S value, on the other hand, indicates that the numbers alternate about their theoretical average[3]. The error bar also measures the consistency of the average R/S value at a window of size N across the entire sequence length. A small error bar implies that the specific arrangement that the log(R/S) measures is repeated across the entire sequence. Said differently, the rescaled range analysis adopted here is practically scanning with the R/S tool of window size N through the entire length of a time series to detect for consistent deviations from randomness as described by Hurst theory. The presence of such deviations marks a fractal fBm character in the time series. The size of scanning window varies from a minimum $N_C$ to a maximum $N_t$. More details of the present data fitting approach are also found in references (Pallikari, 1998; Pallikari & Boller, 1999).

In nature closely separated records of events in a time series are usually correlated, while the correlation decays exponentially with time, or separation between neighbors in the time series. In this analysis we are interested in fBm trends which are maintained across very large data separations, underlining a long-range coherence, as it will be discussed in the following section. It is preferable to scan the data by the R/S tool starting from a large enough cut-off window $N_c$, depending on the length of the original sequence of data $N_t$, to avoid naturally occurring short-term correlations and thus the overestimating of the H exponent. The analysis adopted here a minimum window of $N_c = 500$ units.

*3.2 Error analysis*

Errors were estimated according to the standard statistical procedures of error analysis. However ordinary the application of such approaches could sometimes be confusing. To avoid possible confusion an explicit description of the error estimates used here is considered mandatory. Throughout this work there were two distinct types of estimated errors, (a) the errors of averages and (b) the errors of slopes obtained in a least square straight-line data fitting procedure.

*3.2.1 Error of estimating (R/S).*

Error of averages were estimated and displayed as error bars on the Hurst graphs in figure 2 (error of the logarithm of (R/S)) or as H exponent averages figure 1 and tables 1 & 3. The error, $\sigma_\alpha$, of estimating the average $\overline{X}$ of n data $X_i$, $X_i \equiv [R/S]_i$ (Barlow, 1989) is

$$\sigma_\alpha = \sqrt{\frac{\sum_i \left(X_i - \overline{X}\right)^2}{n\ (n-1)}} \qquad \text{(A-1)}$$

Considering samples drawn from a normal, or approximately normal, population with mean $\overline{H}$ and known sample standard deviation (standard error), a confidence interval based on a student's t test can be determined (Barlow, 1989; Tang Strait, 1989). This interval sets the limits within which the true value of the estimated average lies at a certain probability, e.g. 99% as in our present analysis.

[3] Of all the possible arrangements of three zeros and three ones, the 000111 corresponds to R/S =3 and the 010101 to R/S=1.

Table 1
HURST EXPONENTS AND THEIR STATISTICAL SIGNIFICANCE

| File | H | 99% confidence interval | df | $\sigma_H$ |
|---|---|---|---|---|
| Experimental raw 450,000 | 0,521 | 0.510 to 0.532 | 62 | 0,004 |
| Experimental shuffled 450,000 | 0,511 | 0.500 to 0.522 | 62 | 0,004 |
| Control 450,000 | 0,508 | 0.500 to 0.516 | 62 | 0,003 |
| Calibration 500,000 | 0,505 | 0.489 to 0.521 | 37 | 0,006 |
| Calibration 100,000 | 0,513 | 0.474 to 0.552 | 28 | 0,014 |
| Simulated4 450,000 | 0,469 | 0.455 to 0.493 | 5 | 0,006 |

Hurst exponents of five sequences of REG device records and the average Hurst exponent of six computer simulated sequences each of 450,000 data points, obtained at a cut-off window $N_c$=500. The standard error, $\sigma_H$, is estimated by the data fitting process, see figure 1.

(df): degrees of freedom = n-2, for the REG sequences referring to the points n of the data fitted to a straight line and df = n-1 .referring to the number, n, of simulated sequences.

99%confidence interval: the region of H values in which the real H value lies at 99% probability.

*3.2.2 Error of estimating the Hurst exponent*

The rescaled range analysis determines n sets of [ $y_i \equiv \log(R/S)_i$ , $x_i \equiv \log N$ ] points. The data sets [$y_i$, $x_I$] are fitted to the equation (3) by a least squares straight line fitting procedure. The H is represented by the slope of the straight line and is estimated by:

$$H = \frac{\overline{xy} - \bar{x}\,\bar{y}}{\overline{x^2} - \bar{x}^2} \qquad \text{(A-2)}$$

The error $\sigma_H$ associated with the estimation of H is:

$$\sigma_H = \sqrt{\frac{\sigma^2}{n\left(\overline{x^2} - \bar{x}^2\right)}} \qquad \text{(A-3)}$$

The quantity $\sigma$ in (A-3), termed the *standard error of estimate,* is a measure of goodness of fit of the data in a straight line. It is estimated as

[4] Weighted average from six files and the associated standard error

$$\sigma^2 = \frac{\sum_{i=1}^{n} [y_i - (y_i)_{est}]^2}{n-2} \qquad \text{(A-4)}$$

where $(y_i)_{est}$ is the value of $y_i$ obtained through the best fit of data in a straight line. Whenever indicated weighted averages of H exponent were estimated as $\overline{H} = \frac{\sum H_i/\sigma_i^2}{\sum 1/\sigma_i^2}$ with an associated variance of $V(\overline{H}) = \frac{1}{\sum 1/\sigma_i^2}$.

Figure 1

COLUMN GRAPH OF HURST EXPONENTS

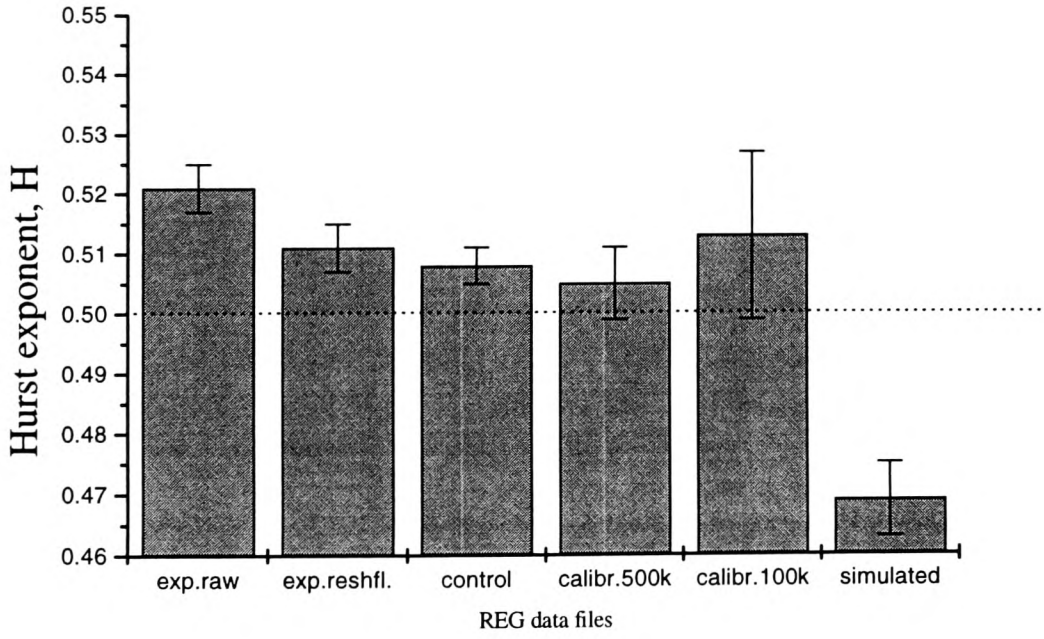


Table 2
STATISTICAL CHARACTERISTICS OF DATA FILES

| | Mean | Σ | St. err. | z | N |
|---|---|---|---|---|---|
| Experimental raw | 100.00218 | 45000982 | 0.01054 | 0.207 | 450,000 |
| Control | 99.99049 | 44995721 | 0.01054 | -0.902 | 450,000 |
| Calibration-1 | 99.99598 | 49997989 | 0.00999 | -0.402 | 500,000 |
| Calibration-2 | 99.96513 | 9996513 | 0.02239 | -1.557 | 100,000 |
| Simulated-1 | 99.99795 | 44999079 | 0.01054 | -0.195 | 450,000 |
| Simulated-2 | 99.98894 | 44995021 | 0.01055 | -1.049 | 450,000 |
| Simulated-3 | 100.00618 | 45002782 | 0.01053 | 0.587 | 450,000 |
| Simulated-4 | 100.0003 | 45000135 | 0.01054 | 0.028 | 450,000 |
| Simulated-5 | 99.98971 | 44995371 | 0.01056 | -0.974 | 450,000 |
| Simulated-6 | 99,98884 | 44994979 | 0.01035 | -1.078 | 450,000 |

Statistical characteristics (Mean, Sum, Standard error, z score, number of units) in each of the four PK-REG sequences (experimental, control, and two calibration) and the six computer simulated sequences.

Figure 2
STATISTICAL CHARACTERISTICS OF DATA FILES

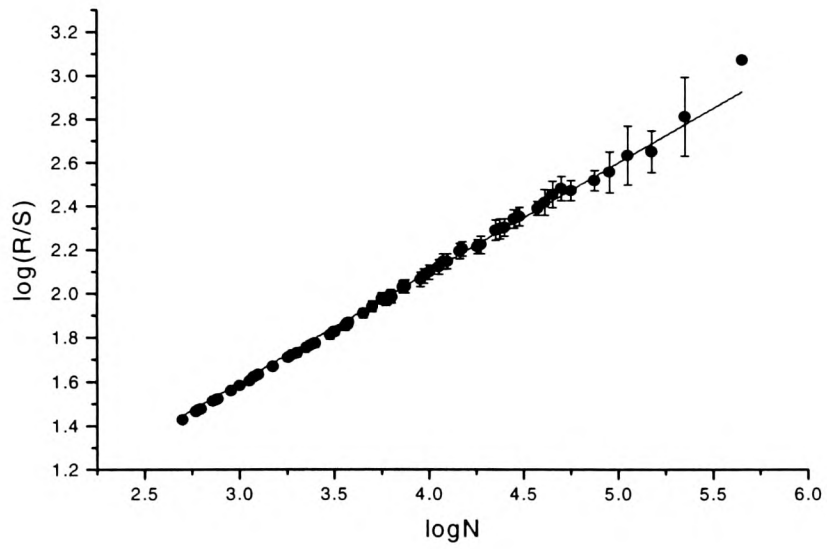
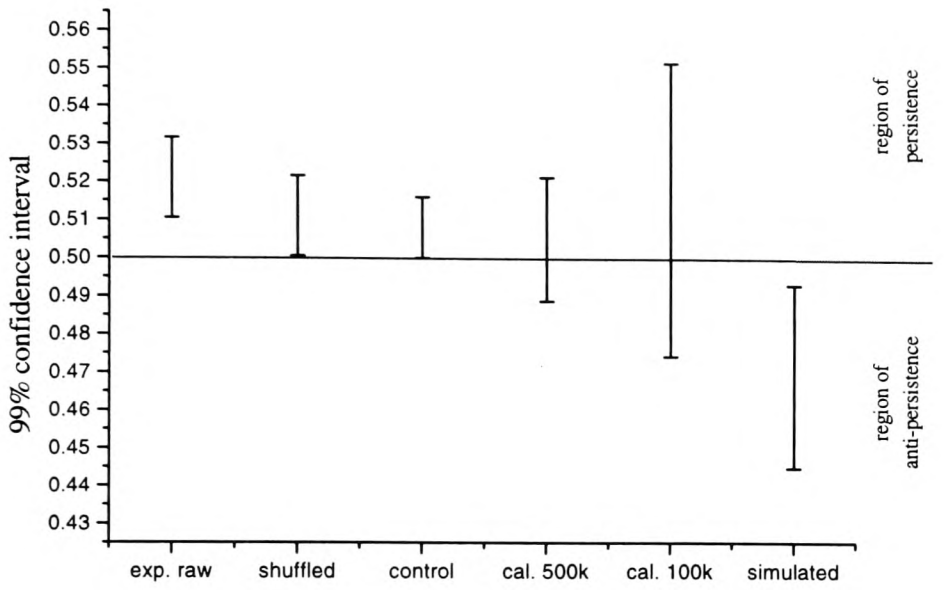


Figure 3
99% CONFIDENCE INTERVAL




## 4. RESULTS AND DISCUSSION

This is an analysis of time series of records of a thermal electronic noise process. Human agent intention is applied at prearranged intervals as an experimental psychophysical constraint. There is, however, no current theory to account for the involvement of such constraint within the electronic noise dynamics. One would expect, therefore, that the very long data sequences display an overall stochastic behaviour under the R/S analysis represented by a Hurst exponent statistically indistinguishable from 0.5. This assertion plays the role of the starting hypothesis to be investigated here.

The Hurst exponents and their associated standard errors are shown in figure 1 and tables 1& 3. A confidence interval within which the true H exponent lies on the basis of the estimated slope, the error $\sigma_H$ and the number of degrees of freedom is evaluated, figure 3. For instance, the true H exponent of the raw experimental REG records sequence at a probability 99% lies within the interval $0.510 < H_{\text{exp.}raw} < 0.532$, {n-2 = 62 and $t_{0.99;62} = 2.659$ }. It is likely, therefore, that the experimental raw data time series exhibit weak fBm persistence[5]. According to table 1, the R/S analysis on calibration data supports a good machine performance akin to a random independent process of event generation since H is statistically indistinguishable from 0.5. The control data sequence is marginally indistinguishable from such a random sequence of uncorrelated data. The coarse shuffling upon the experimental data sequence practically removes the observed persistence statistically rendering it to a random process (at a 99% confidence interval). On the other hand, the computer simulated sequences exhibits fBm anti-persistence, characteristic

[5] We assign as weak persistence any effect associated with a value of H below 0.6 and above 0.5

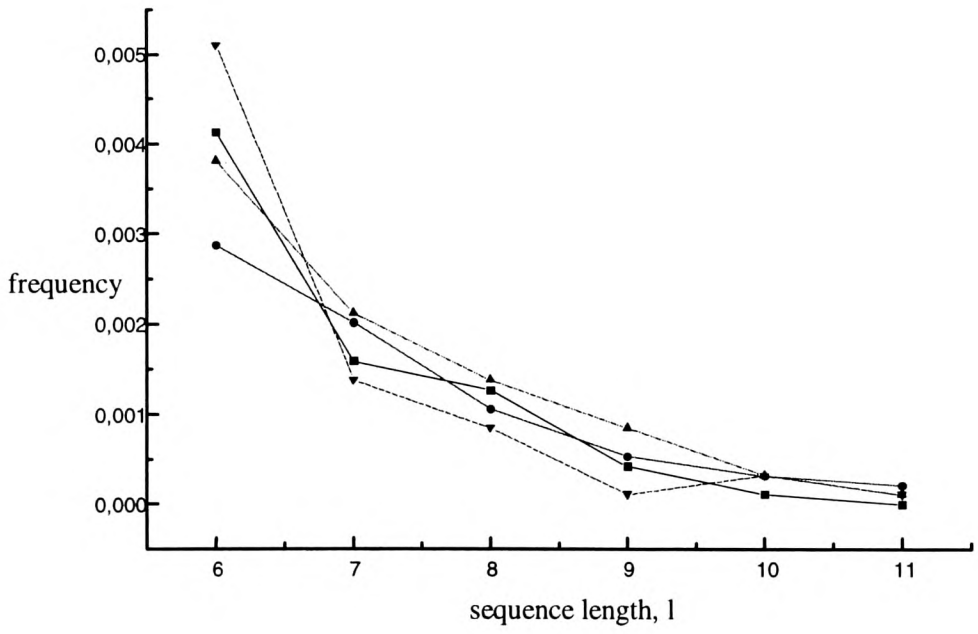
of the kind of error done by human agents when trying to write down a random binary sequence; the bits will alternate about the average more often than chance would predict! We observe, therefore, that of all the electronic REG time series a $H \neq 0.5$ was identified in the experimental raw time series.

*4.1 Why does the micro-PK mechanism imply Jungian Synchronicity?*

Synchronicity comes from the Greek words σύγχρονος, συγχρονισμός, or, συγχρόνως, which broadly mean events occurring at the same time, or in phase to each other (συν = co + χρόνος = time).

According to the fractional Brownian motion model (Mandelbrot & Van Ness, 1968) an estimated H exponent above 0.5 indicates the presence of long-range persistent correlations which interconnect the whole length of data units at any separation in the series. Persistence is interpreted as follows: if a trend sparks out of chance in the time series, a kind of memory tends to maintain this trend. For instance, if a positive deviation from the theoretical statistical average (i.e. 100) occurs over one trial, the probability that there will be another positive deviation over the next trial is higher than chance (i.e. 0.5). In fact, this probability, p, is related to the H exponent through $p = 2^{2H-1} - 1$. It is obvious that within the time series exhibiting fBm persistence, longer runs of numbers either above (or below) 100 will occur as compared to time series having $H = 0.5$. In other words, the time series will be characterized by runs of events longer than chance predicts sharing the same feature: their position on the 'right' or the 'left' of the theoretical statistical average.

Figure 4
LENGTH OF RUN AND H EXPONENT



The results of the present analysis indicate that such an ordering of similar events is present in the experimental time series rather than in the other time series generated by the same REG machine as it will be discussed in the following paragraphs. The experimental data have incorporated the 'obscure' condition of human agent intention introducing the element of consciousness in an otherwise typical recording process of electronic noise. It would be daring, but we could reluctantly put forward the suggestion that it is this obscure condition responsible for the observed anomaly. Our reluctance stems from the fact that no such mechanism is presently available within our scientific framework.

We have observed in this work that an H exponent above 0.5 is related to longer runs of numbers above the theoretical average as compared to time series having a lower H, see figure 4. The frequency of runs of numbers above the theoretical with lengths between 7 and 11 is slightly higher in those sequences with higher H exponent. There is a persistence of numbers above the theoretical average of lengths between 7 and 11. Since each REG number originates from 200 bits, the persistence observed by way of similar numbers is transferred through from the level of bit sequences. In other words, the runs of the same bit in the experimental data are expected to be on average longer than chance would predict, although such an evaluation has not been possible due to practical reasons.

The orthodox statistical analysis tests the time series for possible shifts of the statistical average from chance. As table 2 shows, no such deviations were observed in the data sequences. Even the larger databases, from which the time series analyzed in this work originate, demonstrate the same negative result (Jahn et al. 2000). The R/S alternative analysis, on the other hand, was sensitive to deviations from randomness in the experimental time series. A clear (z score = 5.25) yet weak effect (~4% deviation from chance) in experimental data was detected, since this data sequences distinctly failed to satisfy the original hypothesis (H=0.5). The combined evidence from the orthodox and alternative statistical analyses suggests that the mechanism underway does not affect the statistical average but rather introduces an arrangement of the random data into specific patterns. The observed pattern here is the persistence of runs of similar events. The mechanism appears to work, therefore, at a deeper level that affects the data arrangements, 'in-forming' and binding them in ways reminiscent of Jungian synchronicity. Like events are bound by meaningful connections, such as their position about the theoretical statistical average. Since this is observed in experimental data it further implies relevance with a property of consciousness, the human agent intention.

How can a mechanism act at a deeper level of data arrangements yet leaving the statistical average within chance? We shall attempt an explanation. It is obvious that such a mechanism cannot be mediated by force acting upon each binary unit biasing their generation, or clearly a shift in the statistical average would have been observed. Table 3 shows that the whole of PK-REG sequences together are marked by a very weak tendency for persistence in similar numbers evidently due to the (persistent) contribution of experimental data. In table 1 it is shown that this tendency in the REG process gets subtly sustained when the human agent constraint is involved (experimental data). It is as if human agent intention infuses some kind of 'glue' among the like events. The run is thus sustained for slightly longer than it would be just by chance. The REG bits, however, do not seem to be biased as the analysis on the calibration data suggests tables 1 & 2. Consequently, this gluing effect would be equally likely upon 0's or 1's. Therefore, runs of 1's or 0's would be equally likely and the statistical average of the data in the sequence would be expected to show no shift from chance. Extending this story over to the level of REG numbers, persistence in runs of numbers above the theoretical would be expected to be equally likely as persistence in runs below the theoretical. The result of this would be no shift of the statistical average in the distributions of random events. This description is in fact in harmony and agreement with our everyday experience of physical

reality to be concrete and unperturbed by subtle volitional influences. This is also true for our experience of scientific experiments yielding repeatable solid results regardless of whether a mind wishes it to be otherwise. Any consciousness-related effects, if present, should act at a deeper level, that of information and meaningful connections between individual events, becoming eventually blurred by the powerful law of large numbers and yielding no overall statistical average shifts. Pauli shares the same view as he writes to his assistant Markus Fierz in Zurich, June 3rd 1952 (Meyenn, 1999):

> 'The synchronistic phenomena (Σ) as considered by Jung in a narrow sense cannot be captured by the natural laws because they are not reproducible, i.e. they are unique and they get blurred by the statistical laws of large numbers.'

It would be expected, therefore, that PK-REG experiments that generate very long data sequences, such as the one of this study, would not exhibit statistical deviations of averages from chance. Still, deviations from chance may be observed in experiments generating appropriate smaller lengths of data sequences.

Finally, it should be noted that the above description of a possible mind-physical reality mechanism is only a tentative one. Firm conclusions will be drawn only if the evidence presented in this work constitutes an independently repeatable observation. This should not be difficult to establish, as there is a very large amount of available data on which the present analysis could be applied.

Table 3.
CUMULATED HURST EXPONENTS AND THEIR STATISTICAL SIGNIFICANCE

| File | $\overline{H}_w$ | 99% confidence interval | df | $\sigma_H$ |
|---|---|---|---|---|
| All REG data sequences | 0.512 | 0.499 to 0.525 | 3 | 0,002 |
| All 'no-intention' REG data sequences | 0.508 | 0.478 to 0.538 | 2 | 0,003 |

Average H exponent and the associated 99% confidence interval of (a) the four experimental sequences: experimental, control and two calibration, (b) the three sequences involving no human agent intention: one control and two calibration.

## 5. CONCLUSIONS

The result of the present rescaled range analysis indicates a possible Jungian synchronicity mechanism underway the micro-PK process modulating the random event generation. The subtle effect acts at the level of data arrangements forming persistent runs of like events. The evidence implies that the effect is not mediated by a force acting on the random binary events to shift their statistical mean. The arrangement of bits is simply modulated in ways which correlate with human agent intention. This type of meaningful connections between events allows reality to display its concrete character that we experience in our everyday life. If the effect is indeed related to human agent intention will be safely decided by multiple independent replications..

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# AN UPDATED META-ANALYSIS OF POST-PRL ESP-GANZFELD EXPERIMENTS: THE EFFECT OF STANDARDNESS

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## ABSTRACT

A number of meta-analyses have been published claiming that ESP ganzfeld experiments do or do not provide convincing evidence for psi. Hyman and Honorton (1986) agreed that a subset of 28 manual ganzfeld studies were collectively significant, although they disagreed whether the results could be explained by methodological artifacts. A subsequent series of automated ganzfeld experiments by Honorton at the Psychophysical Research Laboratories (PRL) overcame Hyman's objections and provided independently significant results (Bem & Honorton, 1994). However, meta-analyses of post-PRL ganzfeld experiments by Milton and Wiseman (1999) and Milton (1999) revealed that the mean effect sizes (*MES*s) obtained in the earlier work were not maintained. These meta-analyses were criticized because they included experiments that obtained negative results using allegedly non-standard ganzfeld protocols (cf., Schmeidler & Edge, 1999). Such evaluations of standardness are potentially biased because they were made with knowledge of the associated ESP results, so the present authors decided to obtain less biased estimates by having three psychology graduate students independently rate the method sections of 40 post-PRL ganzfeld studies, sans results. A standard ganzfeld was defined for the judges by a description of general ganzfeld methodology from Bem and Honorton (1994), plus the method section of the primary report describing the PRL autoganzfeld studies (Honorton et al., 1990). Additional guidelines focused the raters on the experimental procedures per se and discouraged the coding of minor deviations that both sides of the debate would consider within the bounds of standardness. The basic meta-analysis of the 40 post-PRL studies confirmed Milton's (1999) conclusion that they are now statistically significant (by Stouffer *z*), but *MES*s fell outside the confidence limits of both the manual and PRL databases. Both the post-PRL and manual ganzfeld databases were found to be markedly heterogeneous, but not the PRL database. It was noted that previous comparisons between the databases were flawed because the manual and PRL databases were restricted to studies in which ESP outcomes were defined as the proportion of direct ESP hits (DH), whereas the post-PRL database was not. For both the manual and post-PRL databases, the DH studies produced markedly better results than the non-DH studies. Comparisons between the DH studies in each database and all studies in each database gave mixed results, with *MES*s from the post-PRL DH studies now falling within the confidence limits of the PRL studies but not the manual DH studies. Standardness ratings of the post-PRL studies were positively correlated with ESP *ES*s ($p$ =.024, one tailed), and *ES*s from standard studies (above the midpoint of the rating scale) were significantly more positive than those from non-standard studies ($p$ =.020, one-tailed). DH studies were more standard than non-DH studies ($p$ = .005). Weighting *ES*s by standardness ratings and restricting the meta-analysis to standard studies raised the Stouffer *z*s and *MES*s, such that *MESs* for the post-PRL studies fell more safely within the PRL confidence limits. They sometimes fell inside and sometimes outside the manual confidence limits, depending on the particular analysis. Weighting studies by sample size brought the *MES*s of the various databases into closer proximity, but these weighted studies were not fully meta-analyzed for this report.

## INTRODUCTION

The controversy about scientific evidence for psi phenomena has raged unabated for over a century. In recent years, much of the debate has focused on a relatively large number of free-response ESP experiments using a short-term sensory isolation procedure called the ganzfeld. The controversy began over 20 years ago when Charles Honorton (1978) conducted a survey of 42 previously reported ganzfeld experiments of which 23 (55%) reported statistically significant results. Honorton's conclusions were challenged by critic Ray Hyman (1983, 1985), and Honorton (1983, 1985) responded. The combatants subsequently came

together to publish a "joint communiqué" in which they agreed that the results could not be attributed to chance, but disagreed as to whether they could be explained by methodological artifacts (Hyman & Honorton, 1986).

Honorton proceeded to conduct a successful series of automated ganzfeld experiments (autoganzfeld) in which he eliminated the possible artifacts pointed out by Hyman (Honorton et al., 1990). The ganzfeld gained considerable notoriety when these experiments were summarized, along with a meta-analysis of the earlier studies, in a prestigious mainstream psychology journal, *Psychological Bulletin* (Bem & Honorton, 1994). The authors noted that results of Honorton's automated ganzfeld studies fell within the confidence limits of, and were in fact quite similar to, the results of the earlier studies. A debate between Hyman (1994) and Bem (1994) on the possibility of methodological and statistical artifacts followed.

Bem and Honorton (1994) ended their paper by noting that conclusions about the broader replicability of the ganzfeld effect await results obtained by other investigators in the future. This observation inspired Julie Milton and Richard Wiseman to conduct a meta-analysis of 30 new ganzfeld studies begun after 1987 and published by February, 1997. They found that the new studies yielded overall chance results, with a Stouffer $z$ of 0.70, $p = .24$, and a mean effect size of .013. These results were also reported in *Psychological Bulletin* (Milton & Wiseman, 1999). Milton (1999) subsequently updated this meta-analysis, noting that although the additional studies raised the total post-PRL database to statistical significance, this outcome was attributable to one experiment (Dalton, 1997). Moreover, the mean effect size was not raised appreciably and remained significantly lower than those of the earlier databases.

The meta-analyses by Milton and Wiseman have been subjected to criticism, much of which surfaced in a debate originally conducted over the Internet and edited for publication by Schmeidler and Edge (1999). The most important of these criticisms is that Milton and Wiseman (1999) failed to note that the results were significantly heterogeneous and this heterogeneity invalidated the analysis, a conclusion that Palmer expressed disagreement with at the time. Specifically, the critics claimed that several studies contributing negative $z$-scores used non-standard ganzfeld procedures and should not have been included with the others. Presumably, the elimination of these studies would raise the Stouffer $z$ and mean effect size to significant levels more in keeping with earlier ganzfeld results. Milton maintained that the methods used in these studies were in fact standard, and added that the methods of a successful study published after the deadline for their meta-analysis did *not* use standard procedures (cf., Symmons & Morris, 1997).

The significant heterogeneity in the database suggests that some sort of procedural elements must have influenced the results, and departures from the standard ganzfeld protocol are certainly one candidate. Unfortunately, most of the judgments of non-standardness presented heretofore are susceptible to bias because they were made with knowledge of the experimental outcomes. We decided to explore the possibility of obtaining non-biased, or at least less biased, estimates. Dr. Daryl Bem found graduate students from his psychology department at Cornell who agreed to do the necessary evaluations. These evaluations were based on the method sections of the relevant reports, sans results. The sample included the formal studies surveyed by Milton (1999) and one study published subsequently (Alexander & Broughton, 1999), raising the total to 40.

## Method

### *Publication Sources*

The following publications were surveyed to find ganzfeld experiments reported after those analyzed by Milton and Wiseman (1999), up to the present survey, which began in January 2000. They were, in alphabetical order, *European Journal of Parapsychology*: 1997 and 1998; *Journal of the American Society for Psychical Research*: January 1997 to July 1998; *Journal of Parapsychology*: December 1996 to June 1999; *Journal of Scientific Exploration*: Spring 1997 to Winter 1999; *Journal of the Society for Psychical Research*: April 1997 to October 1999; and *Proceedings of the Parapsychological Association*: 1997, 1998, and 1999[1]. In keeping with Milton and Wiseman (1999), experimental series segregated as such within a given report were treated separately, although experimental conditions within a given series were not. Using this criterion, 10 additional studies were found from six reports (Alexander & Broughton, 1999; Dalton, 1997; Parker & Westerlund, 1998; Symmons & Morris, 1997; Wezelman & Bierman, 1997; Wezelman, Gerding, & Verhoeven, 1997). All studies described as using some sort of ganzfeld procedure were included; no efforts were made at this stage to identify non-standard procedures.

When reports appeared both in the *Proceedings of the Parapsychological Association* and a journal, the journal publication was chosen. This led to two changes from the sources used by Milton and Wiseman (1999). The journal paper by Broughton and Alexander (1997) replaced the *Proceedings* paper by Broughton and Alexander (1996). The journal paper by Parker, Frederiksen, and Johansson (1997) replaced the *Proceedings* paper by Johansson and Parker (1995). The journal papers were not available when Milton and Wiseman did their meta-analysis. These substitutions did not affect the statistical outcomes reported by Milton and Wiseman (1999) for these studies.

### *Raters*

The raters were three advanced graduate students in psychology at Cornell University, selected by Bem[2]. All have had considerable experience designing and conducting laboratory experiments in social psychology. They are all familiar with the general topic of the ganzfeld from lectures by Bem, but these lectures dealt only with the Bem and Honorton (1994) report and did not make reference to the post-PRL studies. Moreover, Bem never discussed these studies with the raters privately. He describes their attitudes as open-minded skepticism.

### *Preparation of Rating Materials*

#### *Editing*

Method sections were photocopied from each of the experimental reports and edited to eliminate the following three types of material:

- Descriptions of psychological tests, provided they were not given during the ganzfeld or used for subject selection
- Hypotheses
- References to results of other experiments in the sample
- Title of the article (running head) at the top of the pages

[1] In some cases, publication lags caused journal issues to be sampled that were dated prior to February 1997.

[2] We wish to thank Richard Eibach, Nicholas Epley, and Thomas Keegan for serving as the raters.

Paragraphs were eliminated through a scissors-and-paste procedure, whereas sentences were eliminated by covering them with a black magic marker. The resulting text was then photocopied again.

There were only 36 separate method sections for the 40 studies, because of four instances in which the methods were identical for two separate series.

On top of each method section was stapled one or more rating sheets (depending on the number of series described in each section). The rating sheet consisted of a 7-point Likert-type scale with "standard" and "non-standard" defining the left and right poles respectively. Underneath the scale were ten blank spaces in which the raters could specify methodological deviations that influenced their ratings.

The raters were also provided with material to define a standard ganzfeld. This material consisted of the following two texts:

- A general description of the ganzfeld from the section labeled "The Ganzfeld Procedure" in the report of the original meta-analysis published in
  *Psychological Bulletin* (Bem & Honorton, 1994, pp. 5-6)
- Most of a method section describing the PRL autoganzfeld experiment, which is considered to be the prototype, or model, for the subsequent studies
  (Honorton et al., 1990, pp. 102-110)
- Each rater received a "Summary Sheet" in which they were to list the rating they gave to each method section, defined by code number only. This is so the authors could assess the reliability and distribution of codings, while remaining blind to which rating was given to which particular study. We wanted this information to help us decide how the data should be analyzed statistically.

Finally, the raters were told by Bem to not consult with one another about their ratings, that is, to make them independently.

*Randomization*

The plan was to have the experimental series evaluated in random order. This objective could not be completely met because the method sections for some series referred the reader back to the method sections describing previous series by the same experimenters. This required that some series be bundled together, as follows:

- Bierman (1995): Series III and IV
- Wezelman and Bierman (1997): Series IVB, V, and VI
- Broughton and Alexander (1997): Series FT1&2, EC1, CLAIR1, and GEN1; Alexander & Broughton (1999)
- Parker et al. (1997): Studies 1, 2, and 3; Parker and Westerlund (1998): Studies 4 and 5, Serial
- Kanthamani & Broughton (1994): Series 3, 4, 7, and 8
- Morris, Cunningham, McAlpine, & Taylor (1993): Cunningham Series and McAlpine Series
- Willin (1996a and 1996b)

This bundling created 20 separate packets containing the 36 method sections.

Each method section had its own code number, selected by random permutation using a computer program Palmer wrote using Turbo basic software. Code numbers were written on the upper left corner of each rating sheet by an assistant not otherwise involved in the study[3]. Then, three additional random permutations of the numbers 1-20 were generated. The assistant used these three permutations to order the

[3] We wish to thank Mr. Paul Blue, Administrative Assistant at the Rhine Research Center, for completing this task.

sequence of packets differently for each rater. Palmer remained blind to these orders. The assistant then placed each set of materials in envelopes marked 1, 2, and 3 on the outside and given to Richard Broughton, who confirmed that they were properly assembled. He sealed the envelopes, which were subsequently mailed to Bem for distribution to the raters.

*Instructions to Raters*

The instruction were emailed to Bem, who downloaded them and gave them to the raters along with the sealed envelopes. They are reproduced verbatim below:

> We are engaged in a meta-analysis of ESP experiments using an altered-states induction procedure called the ganzfeld. We wish to set apart studies that used non-standard methodologies, but it is a matter of judgment when the deviance from the standard ganzfeld method is great enough to merit the label of non-standard. We do not want to make this judgment ourselves, as we might be biased by our knowledge of the experimental outcomes.
>
> This is where you can help us. In the enclosed envelope you will find 20 packets containing 36 method sections reproduced from reports describing 40 ESP-ganzfeld experiments or experimental series. They are complete, except for the removal of most sub-sections describing psychological tests and hypotheses, and references to results of other experiments that are included in the set. The method sections are arranged in random order, except for those that are included in the same report or that refer the reader to an earlier report for details not repeated in the later report. In such cases, descriptions given in the first method section will apply to some degree to series described in the subsequent method sections. These sections are stapled together to form single packets. All the packets are numbered 1 - 20 in the upper-right corner and should appear in this order in your envelope.
>
> In front of each method section you will find one or more 7-point rating scales with "standard" and "non-standard" at the poles. Your task is to circle the number that corresponds most closely to your estimate of the degree to which the method for the series in question deviates from the standard. Your ratings need not fall in any particular distribution or cover any particular range. At the bottom of the sheet, you will be asked to list each deviant element you found in the protocol that you considered important enough to influence your rating. (Standardness and importance will be defined later in these instructions.) Read over all the method sections first, to get a sense of the range of procedures utilized. Then go back and read each one again carefully and give it a rating. IT IS IMPORTANT THAT FOR EACH RUN-THROUGH YOU READ THEM IN THE ORDER THEY ARRIVED IN THE ENVELOPE. ALSO, DO NOT REMOVE ANY OF THE STAPLES.
>
> If there are two or more experimental conditions, all of which involve the ganzfeld, base your rating on the average standardness of the conditions. If a ganzfeld and non-ganzfeld condition are compared, base your rating on the ganzfeld condition, except that in a within-subjects design you can consider any impact the non-ganzfeld condition might (or might not) have had on scoring in the ganzfeld condition.
>
> Of course, to rate series for standardness you need a description of what a standard ganzfeld is. This information is supplied in the packet labeled "STANDARD" inside your envelope. It consists of two sections. The section entitled "The Ganzfeld Procedure" comes from an article co-authored by Dr. Bem and published in *Psychological Bulletin*. It specifies the main ingredients of the standard ganzfeld method, and these elements must be included in any ganzfeld procedure if it is to be considered purely standard. You will note that for a few procedural elements the section says that they are used "most often", "typically", or something to that effect. In these instances, the opposite procedure can still be considered standard. For example, the page states that "most often" the procedure includes a sender (telepathy). However, the minority of studies that did not use a sender (clairvoyance) can still be considered standard. Deviant elements can either be substitutes for standard elements or additions to them.
>
> The second section comes from a paper describing a prototypical ganzfeld experiment that served as the model for many of the studies you will be rating. This experiment is often referred to in the to-be-rated method sections as "the PRL experiment" or "the Honorton experiment". Experiments need not conform to all the details of this protocol to be considered standard, but procedures cited in this section should not be considered non-standard if they are incorporated in

the studies you will be rating. (Note: One feature of the PRL experiment not mentioned in its methodological description is that the experimenter, while still blind to the target, *sometimes* helped the subject do the judging.)

You should take note of authors' declarations that their procedures were standard or non-standard, but you are not bound by such declarations.

You should treat as standard the use of *artistic or "creative" subject samples* (as one of the most successful components of the PRL experiment used such a sample) or subjects having had *previous psi experiences* or having practiced a *mental discipline* such as meditation (as such subjects were shown to be the best scorers in the PRL experiment).

There are a few kinds of deviations you should *not* count at all. Do not pay attention to *psychological tests* that might have been given to the subjects, unless they are given while the subject is actually in the ganzfeld or influence the selection of subjects. Even in these cases it is up to you to decide how much, if any, such factors make the method non-standard. Also, do not consider *sample size* or the method of *statistical analysis.* Finally, do not count deviations the only effect of which is to influence the likelihood of *artifacts*, such as sensory leakage of the target information. Such deviations are important in the broader scheme of things, but not for this exercise.

You should base your judgment of standardness not only on the number of deviant elements but also on their importance. Judgments of importance should reflect how likely you think it is that the deviant element might have influenced the results, based on common sense and your understanding of how such judgments are made for other kinds of psychology experiments. In so doing, you should pay attention to the rationale or theory parapsychologists have developed to explain why the ganzfeld should facilitate high ESP scores (although lack of such relevance does not preclude a deviant element from being important). You will find that the *Psychological Bulletin* article discusses this rationale.

You will note that the method sections come in a variety of typefaces. Some come from journal articles while others come from unedited manuscripts accepted for presentation at the annual convention of the Parapsychological Association, parapsychology's equivalent to the APA. Many of these latter papers will subsequently appear in professional journals. In some cases, you may be able to infer from the typeface and presence of typos whether the paper is a journal article or part of the convention Proceedings. The point here is that the quality or characteristics of the studies are not related to the publication source, so this variable should have no influence whatsoever on your ratings.

Our hope is that you will be able to complete your ratings without asking us for help. However, if you find it is essential to clarify something in order to give a meaningful rating, your question should be directed to Dr. Bem.

After you have finished rating all the method sections, please fill out the Summary Sheet, which asks you to simply copy the numerical rating you gave to each series, DEFINED BY ITS CODE NUMBER. (Code numbers appear in the upper left corner of each rating sheet.) We will use this information to determine how to analyze the data, and it is important that while making this decision we are blind to which ratings correspond to which particular studies. (We do not now know which code numbers go with which method sections.) Please make sure not to write anything on the Summary Sheet that could compromise this blind. Then replace the packets back in the envelope, and return the envelope and Summary Sheet separately to Dr. Bem.

Table 1

NUMBER OF TRIALS, Z-SCORE, EFFECT SIZE (*ES*), AND STANDARDNESS RATING FOR EACH STUDY IN THE UPDATED GANZFELD DATABASE

| Study | Trials | *z*-score | *ES* | DH% | Std. |
|---|---|---|---|---|---|
| Bierman et al. (1993) Series I | 50 | 0.03 | 0.00 | 26.0 | 1.00 |
| Bierman et al. (1993) Series II | 50 | -0.30 | -0.04 | 24.0 | 1.00 |
| Broughton & Alexander (1997) FT1[a] | 50 | -0.30 | -0.04 | 24.0 | 1.00 |
| Broughton & Alexander (1997) FT2[a] | 50 | -1.33 | -0.19 | 18.0 | 1.00 |
| Broughton & Alexander (1997) EC1[a] | 51 | 1.81 | 0.25 | 37.3 | 1.00 |
| Dalton (1994) | 29 | 1.76 | 0.33 | 41.4 | 1.00 |
| *Dalton (1997) | 128 | 5.20 | 0.46 | 46.9 | 1.00 |
| Morris et al. (1993) Cunningham Study | 32 | 1.78 | 0.31 | 40.6 | 1.00 |
| Broughton & Alexander (1997) CLAIR1[a] | 50 | -0.64 | -0.09 | 22.0 | 1.33 |
| Broughton & Alexander (1997) GEN1[a] | 8 | 0.46 | 0.16 | 37.5 | 1.33 |
| Kanthamani & Broughton (1994) Series 3 | 40 | -0.91 | -0.14 | 20.0 | 1.33 |
| Kanthamani & Broughton (1994) Series 4 | 65 | 2.01 | 0.25 | 36.9 | 1.33 |
| *Alexander & Broughton (1999) | 50 | 1.60 | 0.23 | 36.0 | 1.33 |
| *Parker et al. (1997) Study 2[b] | 30 | 1.25 | 0.23 | 36.7 | 1.33 |
| *Parker et al. (1997) Study 3[b] | 30 | 1.25 | 0.23 | 36.7 | 1.33 |
| Parker & Westerlund (1998) Study 4 | 30 | 2.40 | 0.44 | 46.7 | 1.33 |
| Parker & Westerlund (1998) Study 5 | 30 | 1.25 | 0.23 | 36.7 | 1.33 |
| Morris et al. (1995) | 97 | 1.67 | 0.17 | 33.0 | 1.67 |
| Kanthamani & Palmer (1993) | 22 | -2.17 | -0.46 | 9.1 | 1.67 |
| Kanthamani & Broughton (1994) Series 8 | 50 | 0.03 | 0.00 | 26.0 | 2.00 |
| Morris et al. (1993) McAlpine Study | 32 | -0.17 | -0.03 | 25.0 | 2.00 |
| Stanford & Frank (1991) | 58 | -1.24 | -0.16 | | 2.33 |
| Kanthamani & Broughton (1994) Series 7 | 46 | 0.03 | 0.00 | 26.1 | 2.67 |
| McDonough et al. (1994) | 20 | 1.02 | 0.23 | 30.0 | 2.67 |
| *Parker et al. (1997) Study 1[b] | 30 | -0.83 | -0.15 | 20.0 | 2.67 |
| Williams et al. (1994) | 42 | -2.30 | -0.35 | 11.9 | 2.67 |
| *Wezelman et al. (1997) | 32 | 2.15 | 0.38 | 43.8 | 3.33 |
| Bierman (1995) Series III | 40 | 1.94 | 0.31 | 40.0 | 3.67 |
| Bierman (1995) Series IV | 36 | 1.33 | 0.22 | 36.1 | 3.67 |
| *Symmons & Morris (1997) | 51 | 2.97 | 0.42 | 45.1 | 4.00 |
| *Wezelman & Bierman (1997) Series IV | 32 | -1.48 | -0.26 | 15.6 | 4.00 |
| Kanthamani & Khilji (1992) Series 6b[c] | 40 | 0.52 | 0.08 | | 4.33 |
| Kanthamani & Broughton (1990) Series 6a[c] | 20 | -0.46 | -0.10 | | 4.67 |
| Parker & Westerlund (1998) Serial Study | 30 | -0.49 | -0.09 | | 4.67 |
| *Wezelman & Bierman (1997) Series V | 40 | -0.91 | -0.14 | 20.0 | 5.00 |
| *Wezelman & Bierman (1997) Series VI | 40 | -0.15 | -0.02 | 25.0 | 5.00 |
| Kanthamani et al. (1988) Series 5a[c] | 4 | 0.22 | 0.11 | | 5.33 |
| Kanthamani et al. (1988) Series 5b[c] | 10 | -2.06 | -0.65 | | 5.33 |
| Willin (1996a) | 100 | -0.33 | -0.03 | 24.0 | 6.67 |
| Willin (1996b) | 16 | -0.24 | -0.06 | 25.0 | 6.67 |

*Note*: DH = Direct Hit. Std. = Standardness. * denotes studies added to Milton and Wiseman (1999). FT1(and 2) = First Timers First (and Second) Experimental Series; EC1 = Emotionally Close First Timers Series; CLAIR1 = Clairvoyance Series; GEN1 = General Series.

[a] Cited as Broughton and Alexander (1996) in Milton and Wiseman (1999).

b Cited as Johansson & Parker (1995) in Milton and Wiseman (1999).

c Series summarized and numbered in Kanthamani and Broughton (1994).

The heterogeneity of the *z*-scores for the 30 studies examined by Milton and Wiseman (1999) is represented by $\chi^2$ (30) = 46.17, $p$ = .030. Adding the 10 new studies markedly increases it, $\chi^2$ (40) = 93.48, $p = 3.6 \times 10^{-6}$.

Table 2

STOUFFER *Z*, MEAN EFFECT SIZE (*ES*), AND *P*-VALUE OF HETEROGENEITY (*H*) OF *Z* FOR VARIOUS META-ANALYTIC SAMPLES, UNWEIGHTED AND WEIGHTED BY SAMPLE SIZE (*N*)

| | Unweighted | | | Weighted by N | |
|---|---|---|---|---|---|
| | Z | ES | p(Hz) | Z | ES |
| Manual-All (39) | 5.60 | .204 | $3.4 \times 10^{-8}$ | 4.54 | .143 |
| DH Only (28) | 6.60 | .263 | $6.2 \times 10^{-5}$ | 6.46 | .230 |
| Automated (10) | 2.55 | .164 | .787 | 2.16 | .132 |
| M/W (30) | 0.70 | .013 | .030 | 1.07 | .028 |
| New (10) | 3.98 | .165 | $4.2 \times 10^{-5}$ | 5.66 | .230 |
| M/W+New (40) | 2.59 | .051 | $3.6 \times 10^{-6}$ | 4.10 | .084 |
| Weighted by Std. (40) | 3.29 | .077 | | | |
| Standard Only (29) | 3.54 | .096 | $2.1 \times 10^{-5}$ | 4.82 | .121 |
| DH Only (34) | 3.42 | .084 | $7.6 \times 10^{-6}$ | 4.57 | .104 |
| Weighted by Std. (34) | 3.79 | .099 | | | |
| Standard Only (28) | 3.78 | .105 | $4.2 \times 10^{-5}$ | 5.22 | .135 |

*Note*: DH = Studies that reported direct hits. Std. = Standardness. Number of studies listed in parentheses after label.

## RESULTS

### *The Basic Update*

Table 1 presents the *z*-scores and effect sizes for all 40 studies in the sample, and the meta-analyses are summarized in Table 2. The figures from Milton and Wiseman (1999) were accepted for the 30 studies in their analysis, and the procedures they used were duplicated to the extent possible for the ten new studies. In cases where the number of direct hits was reported, an exact binomial probability was computed and converted to a one-tailed *z* score. There were three studies (Symmons & Morris, 1997; Wezelman & Bierman, 1997, Series V and VI) in which hits were reported for both subject judges and outside judges. In these cases, *z*-scores were computed for both counts and averaged. This was the procedure Milton and Wiseman (1999) apparently used in the most comparable case from their survey (McDonough et al., 1994). In the Serial Series of Parker and Westerlund (1998), the total number of hits for the 30 subjects, averaged over the four trials per session, was calculated to be 6.75, and the binomial probability of this value was

obtained using .75 extrapolation between 6 and 7. Effect sizes were calculated using the formula employed by Milton and Wiseman (1999), $z/N^{1/2}$ (hereafter labeled *ES*).

The 10 new ganzfeld studies yielded more positive results than the 30 reported by Milton and Wiseman (1999). In contrast to their Stouffer $z$ of 0.70, the Stouffer $z$ for the new studies is 3.98, $p = 3.5 \times 10^{-5}$. This value is inflated by the $z$ of 5.20 assigned to the experiment of Dalton (1997), which also had the largest sample size of the entire 40. The mean effect size for the 10 new studies, *ES* = .165, does not differ significantly from that in the earlier sample, *ES* = .013; $U = 101.0$, $p = .125$.

The most important results are those of the combined 40 studies, which represent the current status of ganzfeld replications. The Stouffer $z$ is 2.59, which is now significant, $p = .0048$. The mean *ES* is .051, which still falls outside the confidence interval of .117 to .408 for the 28 direct-hit manual ganzfeld studies, as well as the .059 to .269 confidence interval for the 10 autoganzfeld series (cf., Bem & Honorton, 1994).

*Mismatch on Direct Hits*

The comparison between the post-PRL ganzfeld studies and the earlier manual series summarized by Bem and Honorton (1994) is not entirely valid because the earlier meta-analysis was restricted to those studies that reported the proportion of direct hits (DH), which was 28 out of 42. Honorton (1985) isolated these DH studies to counter a criticism by Hyman (1985) that Honorton's original meta-analysis was biased because it included several different kinds of ESP scores, some of which may have been selected post-hoc.

Although Honorton's move was justified as a response to Hyman's critique, it left a truncated sample of studies that may not be representative of the whole. Thus, it was decided to calculate $z$-scores for the non-DH studies. For the three studies that used binary hits (Braud & Wood, 1977[4]; Habel, 1976; Parker, 1975), the same procedure was used as for the DH studies, except that .25 was changed to .50 for calculating the exact probabilities. For the four studies that used binary coding of ten target content categories to arrive at an ESP score (Rogo, 1977; Smith, Tremmel, & Honorton, 1976; Terry, 1976; Terry et al., 1976), the $p$-value of the $t$-test value based on the mean number of matches (MCE = 5) was converted to a $z$-score. In the Rogo (1977) study, the $t$ was computed from raw data available in the report. For Terry (1976), an estimate of the standard deviation was necessary to compute the $t$. Taking the average standard deviations from the other three studies in this subsample, which were all close to each other, allowed the estimate to be derived. For Dunne, Warnock, and Bisaha (1977), the mean rank scores of Parts A and B were averaged, and the exact probability of this average was found using the tables of Solfvin, Kelly and Burdick (1978). For three other studies (Keane & Wells, 1979; Roney-Dougal, 1982; Stanford & Neylon, 1975), single-mean $t$-tests of continuous ESP scores provided the $p$-values that were converted to $z$-scores. Finally, three studies provided too little information on which to base an appropriate estimate (Palmer, Whitson & Bogart, 1980; Parker, Millar & Beloff, 1977; Stanford, 1979). In all three cases, the mean ESP score was close to chance.

The 28 DH studies had a mean *ES* of .263, compared to.055 for the 11 other studies for which effect sizes were calculated. The difference, although substantial, was not significant, $U = 204.0$, $p = .119$. The mean *ES* for all 39 studies is .204, with a confidence interval from .080 to .328. The mean *ES* for the 40 post-PRL studies, .051, still falls outside this interval.

An alternative approach to comparing the pre- and post-PRL ganzfeld studies is to exclude from the post-PRL sample those studies that did not include a direct hit measure in the primary report, and compare the remainder to the pre-PRL DH studies. There were six post-PRL series from five reports that did not

[4] Although Braud and Wood (1977) also used binary coding, the binary hit measure was chosen because it allowed the most direct conversion to an exact probability.

report direct hits (Kanthamani & Broughton, 1990; Kanthamani & Khilji, 1992; Kanthamani et al., 1988; Parker & Westerlund, 1998 [Serial Series]; Stanford & Frank, 1991). These series had a mean *ES* of -.135, compared to .084 for the 34 DH studies. The difference once again approached significance, $U = 151.5$, $p = .060$. Thus, in both the pre- and post-PRL samples, studies that did not report direct hits had markedly inferior results. The mean *ES* of the 34 post-PRL DH studies was .084, which still falls outside the confidence interval of .117 to .408 for the manual ganzfeld DH studies but inside the confidence interval of .059 to .269 for the 10 autoganzfeld series. The mean hit rate for the 34 post-PRL DH studies is 30.1%, compared to 38.4 % for the manual ganzfeld database and 34.4% for the autoganzfeld.

*Standardness of Ganzfeld Test Procedures*

Although we felt it necessary to give the raters the option to consult with Bem in case there was something about the instructions they did not understand, no such contacts were in fact made. Thus, Bem's only role in the conduct of the experiment was to distribute and collect the materials for the evaluations.

Cronbach's $\alpha$ for the ratings of the three raters was .78, which is large enough to justify pooling. The mean of the three sets of ratings on the 7-point scale (with 7 meaning maximally non-standard) was 2.69. Examination of the histogram revealed a generally continuous distribution with no clear breaks. It had previously been decided that in this case the mean ratings would serve as weights to be applied to the ESP scores to produce a revised meta-analysis taking account of standardness. (For this purpose, each mean weight was subtracted from 8, so that the most standard studies received the highest weights.) It was decided as a secondary analysis to divide the studies into discrete standard and non-standard groups using the scale midpoint of 4 as the cutoff. (Two studies in which the mean fell exactly at 4 were eliminated from these analyses.)

The degree of standardness is positively and significantly correlated with *ES*, $r_s = .314$, $p = .024$, one-tailed. Thus, the expectation that the studies using the most standard methodology produced the most positive ESP results is confirmed. The same finding holds when the studies are divided into standard and non-standard subgroups. The mean *ES* of the 29 standard studies is .096, compared to -.100 for the non-standard studies, $U = 190.5$, $p = .020$, one-tailed.[5] .

Weighting by standardness scores increases the Stouffer $z$ of the 40 post-PRL studies from 2.59 to 3.29, and the mean *ES* from .051 to .077. This new *ES* falls just outside the confidence interval of .080 to .328 for the 39 pre-PRL manual ganzfeld studies and within the interval of .059 to .269 for the 10 PRL autoganzfeld series. Using the categorical approach, the Stouffer $z$ for the 29 post-PRL studies classified as standard is 3.54. The mean *ES* of .096 falls well within the confidence intervals for both of the preceding databases.

Considering only the DH studies, weighting by standardness increases the Stouffer $z$ of the 34 post-PRL studies from 3.42 to 3.79, the mean *ES* from .084 to .099, and the mean direct hit rate from 30.1% to 30,7%. The new *ES* falls outside the confidence interval of .117 to .408 for the 28 manual ganzfeld DH studies but within the interval of .059 to .269 for the 10 PRL autoganzfeld series. Using the categorical approach, the Stouffer $z$ for the 28 post-PRL DH studies classified as standard is 3.78. The mean *ES* is .105, which falls outside the confidence limits for the manual ganzfeld database but well within the limits for the autoganzfeld database. The mean direct hit rate is 31.0%.

*Weighting by Sample Size*

[5] The fact these two numbers are the same (as absolute values) is purely coincidental

The right-hand portion of Table 2 provides meta-analytic results based on weighting by sample size. Details of these analyses will not be provided in the text, except to note that such weighting elevates the outcomes for the post-PRL studies and depresses them for the studies conducted earlier. Thus, using such weights has the effect of bringing the two sets of outcomes into closer proximity.

## DISCUSSION

### *The Basic Update*

The 10 ganzfeld studies published after the Milton and Wiseman (1999) meta-analysis revealed a marked improvement in outcomes as compared to their 30 studies, although the difference is not quite significant. If it is real, we have no plausible explanation for it, although it should be noted that all the new studies were presumably underway before the M/W meta-analysis was available and, thus, could not have been influenced by it. In any event, the new studies elevated the total post-PRL Stouffer $z$ to statistical significance, although the effect size remained well outside the confidence intervals for both the manual ganzfeld direct-hit studies and the autoganzfeld series.

We confirmed that the studies in the M/W meta-analysis were indeed heterogeneous, albeit marginally. Adding the 10 new studies increased this heterogeneity. Some parapsychologists have argued that meta-analyses should not be undertaken at all if heterogeneity reaches statistical significance, in which case one solution is to remove outliers (cf., Schmeidler & Edge, 1999). Although heterogeneity indeed implies that results of some of the component experiments are influenced by extraneous factors, in our opinion this does not disqualify or render invalid a summary judgment of the whole, provided the above qualification is noted. (The controversy here is similar to whether a main effect in analysis of variance is interpretable if an interaction involving that variable is significant.) Finally, it should be pointed out that the manual ganzfeld database is also strongly heterogeneous, and its meta-analysis too must be discounted if heterogeneity is considered fatal.

### *Mismatch on Direct Hits*

Comparison of the post-PRL database with previous databases is complicated by the fact that the preferred meta-analysis of the old manual ganzfeld experiments was limited to studies in which the proportion of direct hits (DH) was reported, whereas the post-PRL database was not so constrained. We discovered that the non-DH studies in the manual ganzfeld database produced markedly less positive results than those reporting direct hits, and this trend was replicated in the post-PRL database. (A plausible explanation for this finding will be discussed below.) Comparisons between all studies in each database and between the DH studies in each database both failed to change the fundamental outcome, except that the post-PRL DH studies now fell within the confidence interval for the autoganzfeld series.

### *The Effect of Standardness*

The one "extraneous variable" that has been explicitly suggested as causing the heterogeneity in the post-PRL database is departures from the standard ganzfeld methodology (Schmeidler & Edge, 1999), and this is what prompted the current project. Ratings by three psychology graduate students on a 7-point rating scale of methodological standardness were found to be reliable and to correlate significantly with the effect sizes of the post-PRL experiments. Departures from the standard ganzfeld protocol were associated with a drop in ESP scores. Using these ratings as weights in a modified meta-analysis produced elevations in both the Stouffer $z$ and effect size measures.

The primary meta-analysis for which standardness ratings were used as weights yielded an effect size that fell just a hair outside the confidence limits of the full pre-PRL manual ganzfeld database and safely within the limits of the autoganzfeld database. A secondary meta-analysis, conducted on a subgroup of "standard" post-PRL experiments defined as having a mean standardness rating above the midpoint on the 7-point scale, yielded an effect size that fell well within the confidence limits for both databases. Thus, one can make a stronger claim for the standard studies replicating previous work than for all the studies. The one caveat is that the manual ganzfeld database might have contained some non-standard studies, the removal of which might raise the confidence interval to the point that it no longer encompassed the post-PRL effect size. As we have no standardness ratings for the manual ganzfeld studies, we cannot address this possibility further. This problem does not apply to the autoganzfeld database, all analyzed components of which can be considered standard.

Restricting the preceding analyses to the DH studies gave weaker results than using all studies, with the effect sizes falling within the confidence limits of the autoganzfeld studies exclusively.

It was pointed out above that the failure of the non-DH studies to produce positive results might be attributable to their use of non-standard methods in other respects. This speculation is confirmed by the data. The six non-DH studies in the post-PRL database had a mean standardness rating of 4.44, compared to 2.35 for the DH studies; $U = 29.0$, $p = .005$. As the raters were told not to consider method of statistical analysis in making their judgments of standardness, this effect is not confounded.

The mean standardness ratings ranged from 1.00 (maximum standardness) to 6.67. The highest rating was given to the two experiments by Willin (1996a, 1996b) that used musical targets. This was the study cited most prominently by critics of the W/M meta-analysis as being non-standard (Schmeidler & Edge, 1999). Milton had focused on the Symmons and Morris (1997) study as being non-standard because of drum beats replacing pink noise as the auditory stimulation. This study received a 4.00 from the raters, which is the midpoint of the scale. Another study with negative results, which we had heard informally was considered non-standard by critics of the M/W meta-analysis, was Kanthamani and Palmer (1993), the reason being that the sender viewed the target subliminally and was doing an REG PK task in between exposures. This study received a quite benign 1.67 rating.

Although the raters were blind to the results of the experiments, the persons who made up the instructions (namely, the authors) were not, which in theory created a source of potential bias. This situation was unavoidable; even if we had given the raters no guidelines at all, that still would have been a decision, and potentially capable of tilting the results in one direction or the other. One motivating principle in deriving the guidelines was to prevent the raters from citing as deviations aspects of the procedure that both sides in the controversy would most likely consider within the bounds of standardness. If raters had been allowed more license, we feared that so many studies would be rated as non-standard that the exercise would not successfully discriminate between them.

In practice, our most important decision was to define a standard ganzfeld with reference to what had been done prior to the post-PRL studies. This, in turn, was defined operationally as Bem and Honorton's (1994) description of the general ganzfeld procedure and the method section describing the PRL autoganzfeld series (Honorton et al., 1990). These descriptions were written before the post-PRL studies were reported, so there is no way the latter could have influenced the former. All procedural variations mentioned in the Bem/Honorton section were defined as standard, even if they were not used universally in the earlier work. It seemed reasonable that if the authors included them without additional qualification in a section devoted to defining a standard ganzfeld, such was sufficient grounds to define them as standard. Raters were told not to penalize subject-selection mechanisms that had been in the autoganzfeld studies or

were based on knowledge of the best performers in those studies (e.g., experience with a mental discipline; Honorton, 1997.) As the controversy has centered on procedures used in the ganzfeld session per se, the guidelines focused raters' attention on that part of the proceedings, the one notable exception being that they were allowed to consider the impact of other conditions in a within-subjects design. Finally, we stressed that the raters should consider the importance of the deviations as well as their mere presence. In fact, it is these importance estimates that were crucial; a trivial deviation from standardness gets essentially the same rating as no deviation.

The most important and potentially controversial application of the above formula was the decision to pre-define as standard the use of artistic and creative subject populations. Such a selection procedure was the most distinctive characteristic of the highly successful Dalton (1997) experiment, as well as the successful Morris et al. (1995) study and the successful Cunningham series of Morris et al. (1993). This decision was not arbitrary, as it was a special case of the much broader policy to include as standard qualities that were present in some or all of the PRL series. As noted in the instruction to raters, subject selection for creativity was based on the use of such a strategy in one PRL series (Schlitz & Honorton, 1992). In fact, the overall PRL and post-PRL databases are similar in the extent to which this kind of selection was used; it was employed in 1 of 10 (10.0%) of the appropriate PRL studies and 3 of 40 (7.5%) of the post-PRL studies; it encompassed 9.3% of the 215 appropriate PRL subjects and 13.9% of the 1,661 appropriate post-PRL subjects. Finally, selection of a creative subject population was never mentioned as a potential source of non-standardness in any of the published debates leading up to our analyses (cf., Milton, 1999; Schmeidler & Edge, 1999).

## CONCLUSION

Our main results can briefly be summarized as follows. The updated meta-analysis of the post-PRL ganzfeld studies yielded a significant Stouffer *z*. When only studies reporting direct-hit analyses are included, the *MES* of the post-PRL studies fell inside the confidence interval of the PRL database but not the manual ganzfeld database. Taking into account the standardness ratings of methodology caused the *MES* of the post-PRL database to fit more comfortably inside the PRL confidence interval. It fits inside or outside the manual ganzfeld manual database (depending on the analysis), although the appropriateness of these comparisons depends on the untested assumption that all the manual studies would be judged as standard. For the most part, these conclusions differ from those of Milton and Wiseman (1999), which were based on a smaller group of studies, and support the replicability of the ganzfeld procedure. At the same time, the fact that even the standard post-PRL studies exhibit a high degree of heterogeneity indicates that standardness by no means exhausts the list of factors that predict ganzfeld results. Several potential factors were discussed by Milton and Wiseman (1999), but much additional research will be needed before we can arrive at a complete list.

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# INVESTIGATING METHODOLOGICAL ISSUES IN EDA-DMILS: RESULTS FROM A PILOT STUDY

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## ABSTRACT

This paper addresses methodological issues in current EDA-DMILS research. We have conducted an exploratory DMILS pilot study with 26 sessions. We found a remote intention effect with an effect size of approximately r=0.35-0.42 depending on the applied methods. We do not claim any significant psi finding as the experiment was not designed to find or investigate any. We did not apply any psi hypothesis or significance testing. Instead, we studied the variation of this effect as a function of different methodological approaches.

We compared parameters drawn from different components of the EDA signal (tonic or phasic) and found effects similar in size. Furthermore, we contrasted the traditional parapsychological way to parameterize the phasic component with methods adapted from psychophysiological research. These new psychophysiological parameters (frequency of nonspecific responses and the sum of their amplitude) clearly outperformed the parameter used so far in DMILS/Remote Staring Research.

Respiration is correlated with the electrodermal system. This can be seen e.g. in the fact that sudden irregular patterns in breathing cause responses in EDA. We have investigated whether these EDA responses are also part of the remote influence effect. Therefore, we have discarded all electrodermal responses related to irregularities in respiration from our experimental data. The effect size dropped down to 30%-77% (depending on the parameter) of its original value. This indicates that the remote intention effect is very likely to also affect the pulmonary system.

Finally, we compared different statistical methods for the evaluation of EDA-DMILS data. We show the traditional PIS method not to be appropriate and suitable. It lacks statistical power on some data (less than 50% of other methods) and invites misinterpretations by presenting an influence score that is not standardized. We present alternative methods, discuss their advantages and disadvantages, and compare their power using the data of our pilot study.

## 1 INTRODUCTION

Direct Mental Interaction between Living System (DMILS) is a standard experimental procedure for the investigation of the possibility that one system or person intentionally influences another system's or person's physiology from a distance. The majority of the DMILS studies include electrodermal activity (EDA) as the dependent variable and they are referred to as EDA-DMILS experiments. At least 30 EDA-DMILS experiments had been conducted through 1997 (see Schlitz & Braud (1997) for an overview). This figure also includes experiments on "Remote Staring", a similar experimental paradigm investigating whether a person's physiology can "detect" a distant gaze). The overview by Schlitz and Braud (1997) on the results of all EDA-DMILS and all Remote Staring studies shows that 14 out of 30 experiments have yielded significant results. The studies show heterogeneous effect sizes with a mean of $r$=0.25 (Rosenthal's $r$) for both research paradigms.

Since EDA is the only dependent variable in these studies the recording, processing, parameterization and evaluation of the EDA data is the crucial point in interpreting them. Therefore, in a previous study, we evaluated the EDA methodology of all published EDA-DMILS and Remote Staring studies and compared

them with a sample of studies published in leading psychophysiological journals (Schmidt & Walach, 1999). The results of this evaluation indicated that the EDA methodology applied by parapsychologists did not compare to state-of-the-art EDA measurement recommended by psychophysiologists (Boucsein, 1992; Venables & Christie, 1980). None of the studies complied with the "Publication Recommendations for Electrodermal Measurements" issued by leading psychophysiologists in 1981 (Fowles et al., 1981) and most of them even violated common psychophysiological knowledge.

Therefore, we rearranged our EDA methodology in the Freiburg DMILS facility in collaboration with the department of psychological physiology of the University of Wuppertal, Germany. By modifying procedures according to psychophysiological standards new questions about the DMILS paradigm arose. These were namely the following:

1. Which component should be investigated within the DMILS paradigm since EDA itself is not a unitary phenomenon and consists of two components? For one of the components (the fast changing phasic component) there are also different parameterization possibilities. Which parameter will be the most beneficial for DMILS research?
2. EDA as an indicator of autonomous activity is strongly related with the pulmonary system. Irregularities in respiration often result in so called electrodermal responses (EDR). Should these EDRs be regarded as artifacts and be discarded from the data? Or, on the other hand, is the reported DMILS effect due to irregularities in respiration that can be measured indirectly in EDA data?
3. There are different statistical procedures used in the DMILS/Remote Staring literature. Is there a difference between these techniques? What are the advantages and disadvantages of these methods? And which technique is the most appropriate?

Since our knowledge on these questions is insufficient, we decided to look for empirical answers before conducting formal DMILS experiments and performed two pilot studies.

## 2 Pilot study

Our pilot studies had a twofold aim. Firstly, since our laboratory had been modified in many ways one aim of the study was for the researchers working in the laboratory (SS, MB, RS) to get acquainted with the equipment and procedures and to identify potential problems. Secondly, we were looking for empirical answers to the questions formulated above.

Therefore, we designed the pilot study as an exploratory experiment. No specific hypothesis had been formulated and no significance testing had been performed. Thus, it was not conceived as a publishable study to be included in any meta-analysis on DMILS studies. A detailed protocol deposited before the start of the study. We conducted two pilot experiments in parallel and evaluated the data of all N=27 session together to increase power.

### *2.1 Participants*

Participants were recruited by word of mouth among the members of our institutions and with friends. Some pairs were drawn from a sample of participants who had previously replied to a newspaper advertisement. Twenty-seven failure-free session were preplanned, as we expected problems with the new techniques to occur. In total, 42 sessions with 84 participants were conducted. Fifteen sessions were discarded for various reasons such as participants showing no spontaneous EDRs, failures in respiration recording, etc. Finally, twenty-seven sessions were deemed complete. However, one session had to be discarded due to some recording problems that had not been detected earlier. Therefore, 26 sessions including 52 participants entered the analyses presented below. These participants had a mean age of 28.6 (SD = 7.1) years with 28 (54%) being male. Our participants were remunerated for participation.

*2.2 Apparatus*

Skin conductance (SC) was recorded on the non-dominant hand using the constant voltage method (0.5V). Ag/AgCl electrodes with 8 mm in diameter were filled with a 0.5% NaCl electrolyte in a neutral base (TDE-246) distributed by Grass (brand name: "EC-33 skin conductance electrode paste") according to the recommendations by Fowles et al. (1981). Electrodes were attached to the thenar and hypothenar emminces by means of double-sided adhesive collars at least 15 minutes before start of data-collection. The electrodes were connected to an isolated skin conductance coupler which treated the incoming signal by a time-constant of 10 seconds. Thereby we obtained SC-data in two channels reflecting the phasic component (Skin Conductance Response SCR) and the untreated SC-data.

Respiration was recorded by a strain gauge fixed with a belt at the participants' upper abdominal area. The belt was placed in a way that it recorded abdominal as well as thoracic respiration (Lorig & Schwartz, 1990). The strain gauge and the two EDA channels were connected to a measurement device (I-410 General Purpose System) that served as a multichannel bioamp and A/D converter.

Participants were placed in two different electromagnetically and acoustically shielded rooms located at fifteen meters distance. The agent's cabin contained a reclining chair and a computer monitor. The temperature was roughly kept at 22 °C (72 °F). In the receiver's cabin there was also a reclining chair and a computer monitor as well as a device (humidifier) to increase the cabin's humidity. Humidity was raised to a mean value of 50.5% at the start of the recording period. We tested different conditions for the most appropriate temperature. As higher temperatures in the environment increase perspiration, non-specific electrodermal responses are more likely to appear and tend to have higher amplitudes (Schaefer & Boucsein, 2000). Therefore, an environmental temperature up to 26 °C (79 °F) is recommended (see Schmidt and Walach., 1999, p. 321). On the other hand participants should feel comfortable during the experiment. We conducted a set of experiments with a temperature of approx. 23 °C (73 °F) and another set with approx. 26 °C (79 °F). The overall average temperature was 24.9 °C (76.8 °F).

*2.3 Procedures*

We invited pairs of participants to our laboratory. We explained the ideas of our research and gave them a description on the subsequent experimental task. Then they had to decide who wanted to be agent and who receiver. The experimenter then fixed the electrodes at the receiver's hand to guarantee a minimum time lag of 15 minutes between attachment of electrodes and start of data collection (Schmidt & Walach, 1999, p.320).

Thereafter, the experimenter escorted the participants to the two shielded cabins explaining the equipment and procedures in detail and answering further questions. Then the receiver was connected to the recording equipment, and seated in front of a computer monitor which displayed a pleasant and colorful screen saver. Next, the agent was accompanied to his cabin where he or she could see the receiver's' SCR as feedback on a computer monitor. The experimenter locked all doors, went back to the lobby, situated between the two cabins, and started the experiment.

A session consisted of 20 epochs (ten activate and ten calm epochs) each lasting one minute. During an activate epoch the German word for "activate" was inserted below the receivers' SCR curve in the agents' cabin. The agent's task was to activate the distant receiver by means of mentality or intentionality. For a calm epoch the instruction was in the opposite direction. All influence epochs were interspersed by 15 sec rest intervals. The sequence of activate and calm epochs were randomized for every single session by an algorithm drawn from a pseudorandom process in a special way to provide balanced sequence of the two conditions. The end of the experiment was indicated to the experimenter and the agent by a short sound

generated by the computer. Participants then came back from their cabins to share their experiences with the experimenter in the lobby.

Three of the authors served as experimenters in this study. Markus Binder conducted 9 sessions, Stefan Schmidt 12 and Rainer Schneider 5.

*2.4 Data Analysis*

Experimental data were stored at a sample rate of 16 Hz in three different 12-bit channels (respiration, total SC and SCR) with the experimental condition coded in a fourth channel. For further processing of the data software called EDR PARA Version 3.71 (© 1999 F. Schaefer) was used. This software served several purposes. All data could be graphically displayed without seeing the experimental condition. For the calculation of SCL all 960 values (60 sec x 16 Hz) recorded in a one minute epoch of the total SC channel were averaged and converted to the corresponding value of skin conductance expressed in mikroSiemens (µS). This mean was recorded in an output file.

In the SCR channel, the software automatically detected single SC-Responses and parameterized them for latency upon the start of the recording epoch, rise time, amplitude and recovery time (see Schmidt & Walach, 1999, p. 318 for details). All data were written to an output file. Each response could be observed graphically together with the co-varying respiration activity and could interactively be discarded from the output file. All SCR data were filtered by 0.5 Hz low pass filter.

The software parameterized SCRs only when onset and peak were placed within the epoch. In so doing, SCRs starting at the very end of an epoch and peaking in the following rest period could not be detected. Therefore, we extended every experimental epoch by two seconds, thereby shortening the subsequent rest periods by two seconds. In so doing, SCRs with an onset at the end of an epoch peaking within two seconds after the end of this epoch could also be included in the analysis. Yet, SCRs having both onset and peak within these two seconds were excluded automatically by a filtering mechanism. This procedures enforced the idea that the time of the onset and not the time of the peak of any SCR should be related to the remote intention.

A special software module called EDR Select Version 2.1 (© 1999 F. Schaefer) assigned the epochs of all sessions to the experimental conditions activate, calm and rest. The output file of this software was analyzed with the statistical package SPSS for Windows 8.0.

## 3 Which parameters should be taken? Assessing different EDA components

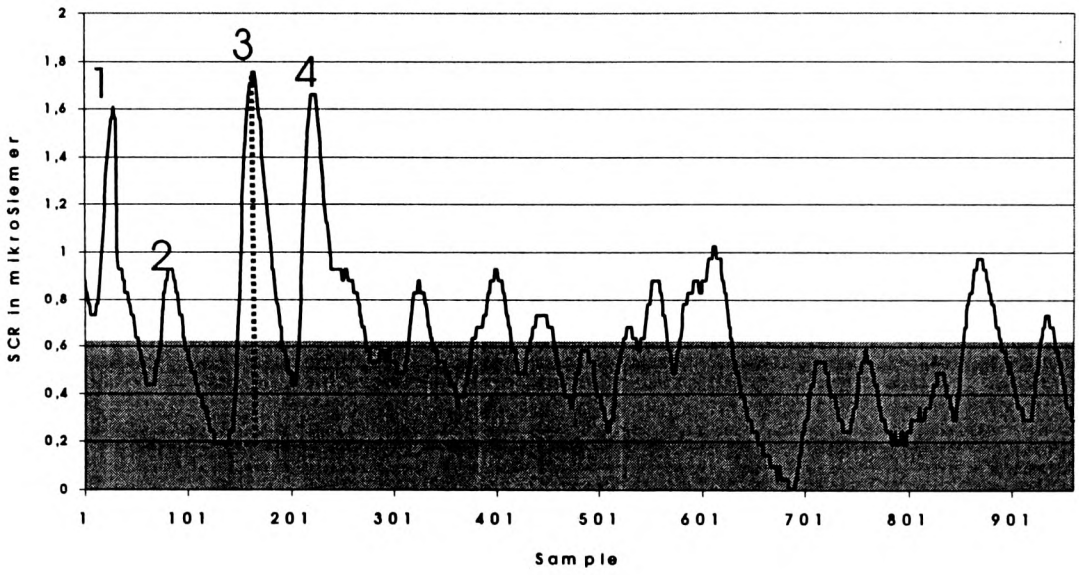
EDA consists of two components. The fast changing *phasic* component (SCR in our study) reflects responses to certain stimuli with a typical pattern of the EDA curve. It rises after a certain latency time to a certain peak and slowly recovers. The other component is a slow changing *tonic* component (SCL in our study) that reflects the overall arousal of the participant. Since the DMILS setup does not include any overt stimuli whatsoever, only tonic parameters reflecting overall arousal were of interest. But, apart from SCL, another tonic parameter can also be derived from the phasic component. This is because the typical SCR patterns can also be found in the absence of any stimulus. These are called non-specific responses (NS.SCR). The number and size of these NS.SCR also reflects overall arousal.

Both SCL and SCR have been dependent variables in DMILS experiments. Whereas the early experiments by Braud & Schlitz (see Braud & Schlitz, 1989 for an overview) have emphasized the phasic component, the majority of researchers in the nineties have assessed the tonic component (e.g. Delanoy, Morris, Brady, & Roe, 1999; Wiseman & Schlitz, 1999).

Obviously, any alleged DMILS/Remote Staring Effect in the EDA could be (1) only in the phasic, (2) only in the tonic or in both. From a theoretical perspective, the effect should be found in both. The question of which component would be more appropriate, or in statistical words, would be more powerful for detecting this effect however, remains unanswered. We therefore recorded both components simultaneously to compare their outcomes.

In order to do that it was important to decide how the components should be parameterized. For the SCL the situation is simple since most psychophysiologists average SCL data over a certain time period (see Schmidt & Walach, 1999, p. 322 for details) and this was done in all DMILS/Remote Staring studies using the tonic component. However, with regard to the phasic component the situation is slightly different. This is depicted in figure 1 showing the raw data of a very high activity SCR recording of one minute duration. The aim of the parameterization process is to find the most appropriate measure to describe the activity pattern that can be easily seen in the graph. There are at least three possibilities.

Figure 1
960 SAMPLES (1 MINUTE) OF SCR RECORDED FROM ONE OF OUR PARTICIPANTS




1. *Number of nonspecific Skin Conductance Responses. (NS.SCR.freq):* One could just count the number of responses exceeding a certain threshold within a certain time period. This is shown by the numbers 1 to 4 for the first four SCRs.
2. *Sum of amplitudes of NS.SCR*: Instead of just counting the unweighted SCRs one could also take their size into account by summing up the amplitudes of all SCRs exceeding a certain threshold within a certain time period. This is shown by the dotted line indicating an amplitude of 1.55 µS for SCR number 3.
3. *Mean over all recorded data points.* While the first two possibilities are usually applied in psychophysiology, parapsychologists preferred a different solution. Almost all DMILS/Remote Staring experiments using the phasic EDA component calculated a mean of all recorded data points within a certain time period. This is shown in the graph by the rectangle indicating the mean value of 0.61 µS.

Which one of these parameter provides the best statistical power to detect a purported DMILS effect is dependent on the way this effect operates. If the effect is responsible for the generation or absence of SCRs then methods 1 or 2 may be the most appropriate ones because they only take information from the SCRs leaving the flat areas untouched. If on the other hand the effect acts in a general way then the methods of averaging all data might have a higher power.

Also for the comparison of NS.SCR.freq. and Sum of Amplitudes of NS.SCR different hypotheses regarding a purported DMILS effect can be formulated. If the DMILS effect is responsible for only the small SCRs while the bigger ones are due to some other internal (e.g. cognitive) stimuli, then the unweighted NS.SCR.freq. should outperform the Sum of Amplitudes. But if, on the other hand, the supposed effect is partly responsible for most of the SCRs then the Sum of Amplitudes will have the better power to find the effect. Furthermore, for NS.SCR.freq. a threshold for SCRs has to be defined. Whereas a large threshold will favor substantial responses, a small one will give a higher impact to very small fluctuations within the SCR data.

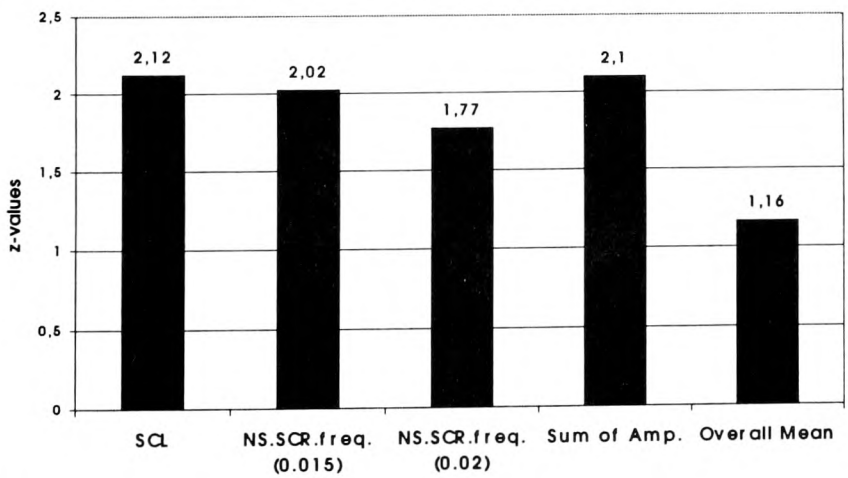
To find out which of those explanations are supported by our data we applied each parameterization method to each of the twenty epochs of each sessions' data. Then we summed up the values of all ten activate and all ten calm epochs for each session. In this way we obtained 26 pairs of activate-calm values for each parameter. Then we calculated a Wilcoxon Signed Rank test on these 26 pairs obtaining z-scores. This analysis method was was chosen by our research group beforehand to be the most appropriate procedure. For further discussion and comparison on analysis methods see section 5.

Results

Figure 2 shows the obtained z-scores. All *z*-values are positive indicating effects in the intended direction (higher EDA activity for the activate condition). There seems to be almost no difference between the tonic and the phasic component parameterized according to psychophysiological standards. The corresponding effect sizes (*r*-effect size) obtained by $r = z/\sqrt{N}$ is $r$=0.42 for the tonic and $r$=0.41-0.35 for the three phasic parameters NS.SCR.freq (with the two different thresholds 0.015 µS and 0.02 µS) and Sum of Amplitudes.

Figure 2

RESULTS OF THE COMPARISON OF ACTIVATE AND CALM EPOCHS IN EDA DATA.




Differences are expressed as z-scores and shown seperately for the 5 different parameters that have been applied on the data.

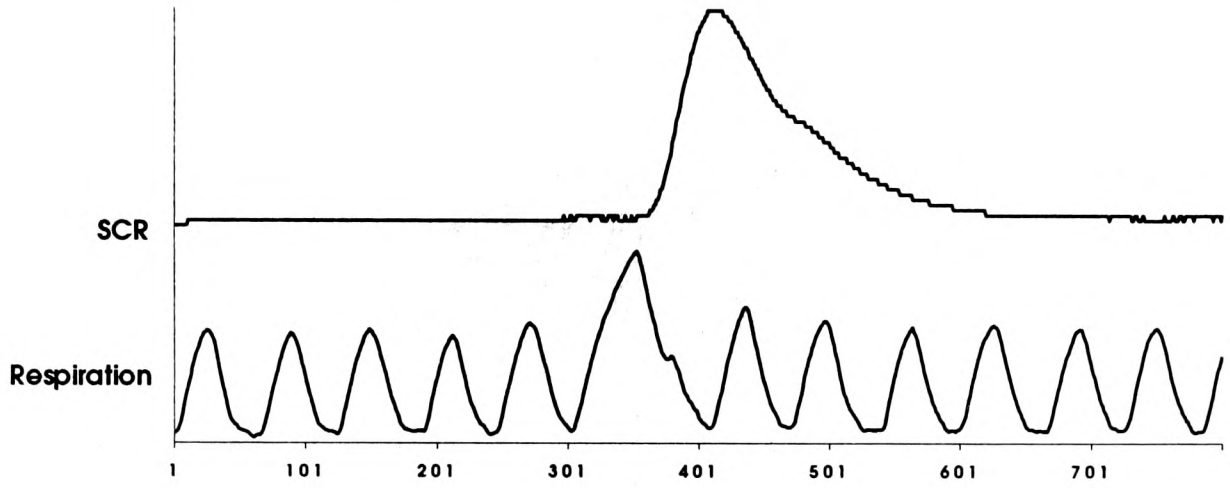
The only exception is the parameter calculated as a mean of all recorded SCR data. The z-score drops to $z$=1.16 (effect size $r$=0.22) indicating that this traditional DMILS method only has approximately half of the power of other measures.

From the comparison of the three psychophysiological measures one can conclude that both large and small SCRs are affected. The fact that the sum of amplitudes shows a high $z$-score can be interpreted as a strong influence of large SCRs, because they receive a higher weight in that measure, but the fact that NS.SCR.freq with the lower threshold show a slightly higher $z$-score would indicate that especially the very small SCRs appear more often during activate than during calm epochs.

## 4 Is Respiration an Artifact? - Assessing the Influence of Respiration on EDA-DMILS data.

The electrodermal system is strongly linked with the respiratory system (Boucsein, 1995). Figure 3 shows a typical pattern that can be found when the respiratory and the SCR recordings are simultaneously displayed.

Figure 3
800 Samples (50 sec.) of SCR and Respiration Data recorded from one of our Participants




Shortly after sample 300 the participant leaves her characteristic respiration rhythm and continues to inhale instead of the expected exhalation. After a latency time of approximately 2.1 sec there is an onset of an SCR with an amplitude of 0.188 µS. One can expect the onset of an SCR after a latency interval of 1 to 5 sec after the start of irregular breathing. This response of the electrodermal system to irregular breathing is similar to the orienting response where an SCR is expected after a latency period of 1 to 5 secs.

Knowing this, we can formulate interesting hypotheses regarding the manner in which a purported DMILS effect operates. The most significant findings in DMILS and Remote Staring studies take EDA as a dependent variable. Studies using other physiological measures like heart rate, blood pressure, blood volume pulse, skin temperature, muscle tension or respiration frequency (Braud & Schlitz, 1991; Braud, Schlitz, Collins & Klitch, 1985; Radin, Machado & Zangari, 1998; Rebman, Radin, Hapke & Gaughan, 1996) only show inconsistent and few significant results. These findings could be interpreted in two ways.

First the effect is global but the changes are so small that it can only be found within the EDA since skin conductance is for some reason the most appropriate variable. Or, second the effect is local and only affects EDA while other physiological systems even with large samples and the best possible methodology would never show this effect. If we cut these ideas down to the accessible EDA-respiration connection we can formulate the following hypotheses:

H1: The purported DMILS effect is local and can only be found in the electrodermal system.

H2: The purported DMILS effect is local in the respiration system. Due to irregular respiration eliciting SCR it can be found in the electrodermal system also.

H3: The effect is global and affects at least two systems (respiration and EDA) simultaneously.

These hypotheses can be tested if we edit the phasic EDA data for respiration 'artifacts'. See e.g., figure 3. The SCR displayed in the graph is elicited by irregular breathing. If we discard all related SCRs from our data we get a second data set that is adjusted from the irregular respiratory activity. The comparison of the edited an unedited data gave us insight regarding the three different hypothesis. In case hypothesis 1 held the effect in the edited data set should have been the same or could even slightly increase as the data is removed from artifacts. If the second hypothesis was true the effect should have dropped to zero for the relevant information was deleted out. If hypothesis three turned out to hold the effect should remain the same or should slightly drop as some part of the relevant information was removed.

We were unable to make exact decisions between these hypothesis by our procedure. But by comparing edited and unedited data set we achieved better understanding of the effect which, in turn, allows for more appropriate process oriented research in the future.

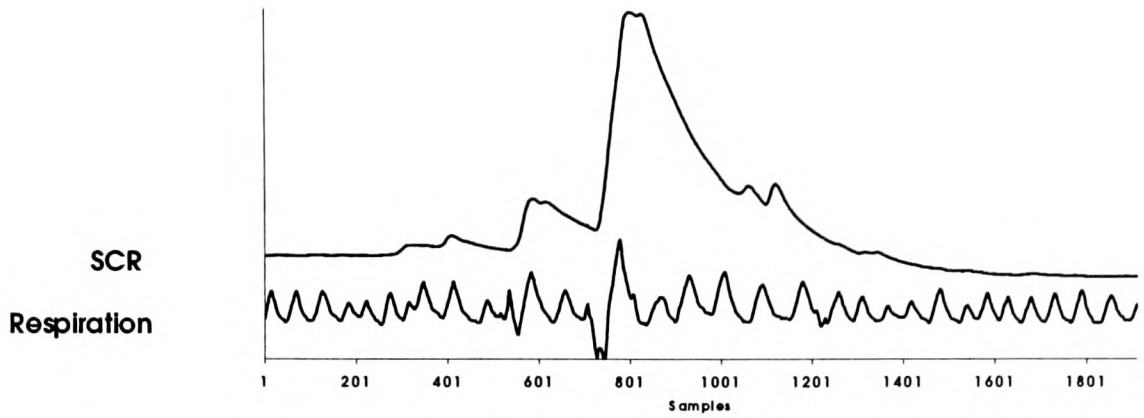
*The procedure of editing*

Editing processes, like the one that was necessary for our data, can hardly be done automatically. A semi-automatically solution might be possible but was not available to us.Therefore, we edited the data manually. This is rather troublesome because manual editing processes are usually highly subjective and intuitive.

Unfortunately, the relationship between EDA and respiration is not that unambiguous and linear as it was displayed in the example in figure 3. For example, irregular breathing sometimes elicits SCRs but sometimes does not. On the other hand, strong SCRs may result in irregular breathing but does not have to. Often one finds chains of mutual responses. See for example figure 4 presenting 1910 samples (approx. 2 min ) of data where several SCRs and several irregularities in breathing are interacting with each other.

In searching for assistance in the literature we found that most psychophysiologists edit their SCR data for respiration artifacts in a rather single expert procedure that is not explicitly described. Confronted with these problems we decided to develop an exact catalogue of criteria for data editing. The data of the pilot study has not been used to develop this catalogue. We used data collected for a different study and also data recorded for the testing of our equipment. The catalogue can be obtained from the authors and will be submitted to publication elsewhere. This catalogue had a twofold aim. Starting from our intuitive and subjective decisions it should formulate explicit rules for editing guaranteeing a replicable process of decision making. Furthermore, the catalogue should provide clear solutions to difficult situations such as described above.

Figure 4
1910 (APPROX. 2 MIN) SAMPLES OF SCR AND RESPIRATION DATA RECORDED FROM ONE PARTICIPANT.




The pattern of irregular breathing with simultaneous strong SCR show the mutual interaction of the electrodermal and pulmonary system.

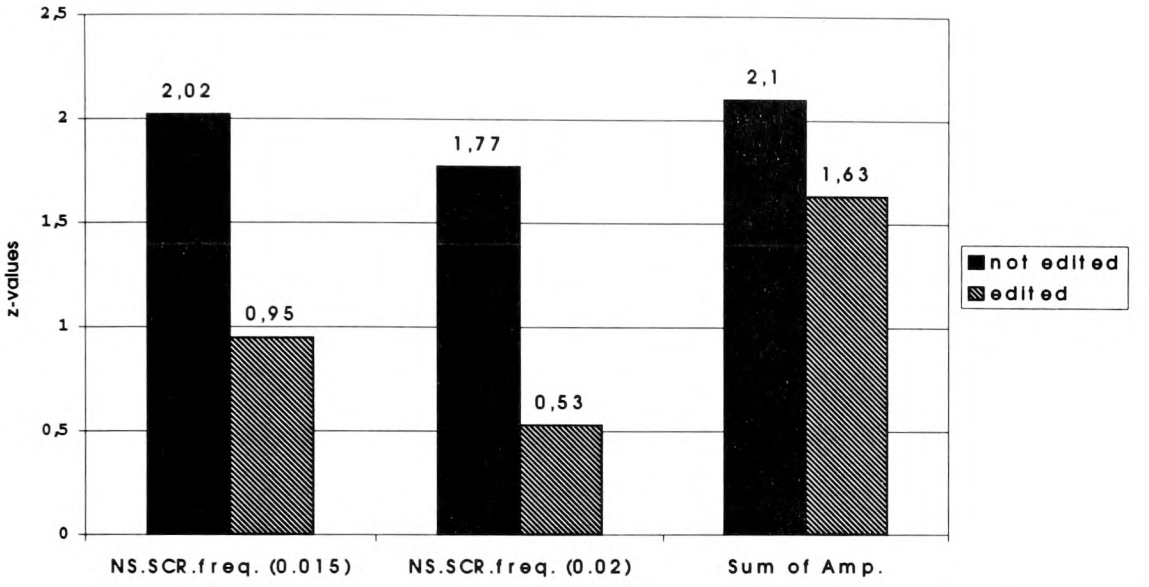
This work was done by the first three authors (SS, MB, RS). We started by discussing observed phenomena and their relationships in our data. Then we identified problems and discussed different solutions. The solutions were checked with different data and the most appropriate one entered the catalogue. Next, every single one of us edited some data sets using this catalogue and we compared the results. By discussing the reasons for different decisions we explicitly formulated any implicit decision criteria. We further discussed the advantages and disadvantages of different decision strategies and extended the catalogue accordingly. This procedure was repeated many times until a sufficient convergence of the different ratings was achieved. The criteria and solutions for difficult situations were checked with Dr. Florian Schaefer, an EDA specialist.

*Results*

Every single one of us us (SS, MB, RS) edited all 26 data sets. We were blind to the experimental condition during the editing process. The reliability over all three raters was $r_3 = 0.92$ for NS.SCR.freq. (reliability on all decisions combined by the three raters according to Bortz & Döring, 1995, p.252) and $r_3 = 0.91$ for the sum of amplitudes, respectively. For statistical analyses, we compared our ratings and discarded every SCR that was edited by at least two of the three raters to form a final edited data set. Figure 5 shows the results. For all three phasic parameters $z$-scores were lower when all respiration linked SCRs were discarded from the data.

These results clearly show that SCRs elicited by respiration have a part in the total effect. Therefore, it is very likely that this effect cannot be reduced to only a local EDA phenomenon. The data presented favor hypothesis 3 for a general effect on both physiological systems followed by hypothesis 2. However, the reported study only had exploratory character and these findings should be confirmed by future studies.

Figure 5
RESULTS OF THE COMPARISON OF EDITED AND UNEDITED SCR DATA FOR THE THREE PARAMETERS' SUM OF AMPLITUDES AND FREQUENCY OF NONSPECIFIC SCRS WITH MINIMUM THRESHOLDS OF EITHER 0.015 µS OR 0.02 µS




The unedited values show the result of the comparison of activate and calm epochs in the phasic EDA data expressed in z-scores. The edited values show the same results after the removal of all SCRs that have been caused by irregularities in respiration.

## 5 HOW TO CALCULATE? - ASSESSING DIFFERENT STATISTICAL PROCEDURES FOR DMILS DATA.

The question how to calculate significances or effect sizes from DMILS data is not a trivial one. Several different procedures have been applied in different studies and we will describe them shortly presenting their advantages and disadvantages. We will outline two methods that have not been applied before. We applied all procedures to our data and compared their outcome.

Data sets of DMILS/Remote Staring experiments consist of several *sessions* with different participants. Each single session consists of several *epochs* reflecting the different experimental conditions (e.g. calm/activate, calm/control, stare/control) with the same number of epochs for both conditions. Within these epochs physiological data are recorded from a set of many data points. These data recorded within an epoch are combined to form a single parameter representing the amount of activity in each epoch. Different possibilities for computing this parameter have been described in section 3. The statistical evaluation must be aware of this triple dependency on the data (a) on the level of measurement points, (b) on the level of epochs, (c) on the level of participants. (a) and (b) are dealt with by aggregation (i.e., summing or averaging), (c) has to be taken into account by the statistical procedure used for testing.

*5.1 Percent Influence Score (PIS)*

The PIS was developed by Braud & Schlitz (1991, p. 5). This score is calculated by dividing the sum of all epochs of one experimental condition by the sum of all epochs for both conditions for each session. By that way one obtains a PIS for each session. In the absence of any effect the PIS is 50 percent and each deviation from that mean reflects an experimental effect. For significance testing all sessions' PIS are tested with a single mean t-test against the expected mean for the null hypothesis (i.e. 0.50).

*Advantage*

The PIS is standardized by the mean. An indicator of success can be easily calculated for each session and can be easily communicated and explained to participants. The procedure is applicable to all kinds of dependent variables.

*Disadvantage*

The PIS is not standardized by the standard deviation. Therefore PIS scores do not reflect experimental success. A large effect size (with a very small standard deviation in the original data) can result in a PIS of 50.01% while a very small effect (with a large standard deviation) size can lead to a PIS well over 60%. Interpretation or comparison of different PIS's says nothing about effects in the data. Furthermore, the statistical power of the PIS is highly dependent on the ratio of the standard deviation and the initial value.

This is demonstrated by a set of randomly generated data simulating DMILS data. We randomly drew a set of 30 numbers from a normal distribution (variable 1). With the help of a second set of random numbers we calculated another set of 30 numbers (variable 2) that is highly correlated (r=0.9) with variable 1 (see Boller & Schweizer (1992) for details). To simulate a DMILS effect we added a constant to variable 2. Variables 1 and 2 are now very similar to a DMILS data set consisting of 30 sessions with variable 1 representing the sum of all calm epochs and variable 2 representing the sum of all activate or control epochs respectively. For the calculation of Percent Influence Scores we systematically added a constant value (either 2, 3, 5, 10, 20, 50 or 100) to every single data point in the set and received seven new data sets with the basic level shifted by the respective constant. We then calculated a paired t-test, a PIS and a single mean t-test for the PIS of each of these data sets. The results are shown in table 1.

TABLE 1

INFLUENCE OF A CONSTANT VALUE ADDED TO A VIRTUAL DATA SET ON TWO DIFFERENT TEST STATISTICS (PAIRED T-TEST AND SINGLE MEAN T-TEST).

| value added | 2 | 3 | 5 | 10 | 20 | 50 | 100 |
|---|---|---|---|---|---|---|---|
| paired t-test | 2.871 | 2.871 | 2.871 | 2.871 | 2.871 | 2.871 | 2.871 |
| t-score of single mean t-test | 1.838 | 2.191 | 2.497 | 2.697 | 2.787 | 2.839 | 2.855 |
| PIS | 53.25 | 51.75 | 51.04 | 50.54 | 50.27 | 50.11 | 50.06 |
| p-value for PIS | 0.076 | 0.037 | 0.018 | 0.012 | 0.009 | 0.008 | 0.008 |

Percent Influence Scores and p-values (two tailed) of the single mean t-test scores reflect the change produced by the added value.

As can be seen, the statistical power to detect the effect for the PIS procedure is highly dependent on the constant added to the variables. The basic structure of the data is always the same as reflected by the constant t-value for the paired t-test over all conditions. However, with a higher constant added the ratio of the standard deviation (always the same) and mean (shifted by the constant) changes. The PIS score is dropping towards the 50% value and the t-value of the corresponding single mean t-test slowly approaches the expected value of 2.871. Likewise, the higher the constant added the more the power of the t-test improves.

In other words, the chances for a DMILS researchers to detect an existing effect in such data is highly dependent on the luck he or she has when he or she calculates the summed values for the epochs. Those who take e.g. the mean and convert it to the unit of skin conductance will end up with low values (e.g. 1.79 µS per epoch). They might find nice PIS values in the 55% area or even higher, but the corresponding t-test has only low power to detect the effect. This situation is made worse by high variances in the outcome values (see section 5.6) But those who just sum up the bit-values from exactly the same data will obtain high values (e.g. 2,400,000 per epoch) low PIS scores in the 50.001 range and a powerful test of significance. Unfortunately, this unreliable statistic was used in almost all DMILS and Remote Staring studies.

*5.2 Two Component Model*

The model which we now describe was named the two component model by us because it combines two statistical tests. In the first stage, after parameterizing the epochs a Wilcoxon Signed Rank test is calculated *for every session* with pairs of epochs of two different consecutive conditions serving as the paired data for the test. (e.g. for a session with 20 epochs in sequence of "ABBABBAABAABBAABAABB", A-B, B-A, B-A, B-A, B-A, A-B, B-A, A-B, A-B, A-B are forming 10 data pairs entering the Wilcoxon). Thus, a $z$-value can be assigned to every session. In a second stage, a test of significance of the whole experiment is applied. The $z$-scores are either combined by the Stouffer-z method or are tested by applying a single mean $t$-test against 0.

The method of calculating a Wilcoxon test on all epochs of one session gives another priority to outliers than just summing up the epochs over the whole session. Imagine one of the epochs contains data ten times higher than in the other epochs. If the data are just summed up this single event will have a large impact on the outcome. If a Wilcoxon test were calculated the data pair containing this epoch would get a top rank, but the size of the deviation is not taken into account. This can be an advantage or a disadvantage depending on the situation and on the way a purported DMILS effect operates (single burst vs. continuos shift). Therefore, the decision of which epoch aggregation procedure is more suitable cannot be made theoretically but only by empirical data. This method was used in recent DMILS/Remote Staring studies as either a major evaluation strategy or an additional method for comparison reason (see e.g., Wiseman & Smith, 1994).

*Advantages*

Similar to the PIS, an indicator of success for each session can easily be calculated and communicated to participants. This indicator is standardized by mean and standard deviation representing a good estimate of the session's outcome.

*Disadvantages*
Calculating two tests on the same data successively always leads to a decrease in power. Therefore, it should be avoided in DMILS research. Most of the DMILS/Remote Staring studies are underpowered anyway if one takes the estimated effect size of $r$=0.25 (Schlitz & Braud, 1997) into account.

But the most important reason to avoid this procedure is the fact that it violates one assumption of the test. The Wilcoxon test implies that pairs to be compared are dependent. But it assumes that the pairs generated as the basis of the comparison are themselves single, independent measurements. With all pairs of data to be tested stemming from the same participant this assumption of independence is violated. Therefore this procedure is not appropriate for the data.

*5.3 Paired t-Test*

One can calculate the sum (or the mean) of all epochs of one session for each of the two conditions. By that way one obtains a pair of data for each session. Next, a paired t-test over all sessions is calculated. This test has not been used in DMILS research so far.

*Advantage*
The paired t-test has a high statistical power compared to other non-parametric tests. This test is the first method presented that has a powerful approach to the data with a higher chance of detecting DMILS effects.

*Disadvantage*
The t-test assumes normal distribution of the differences of the data pairs and homogeneity of variances (Bortz, 1993). In some cases, a normal distribution of EDA-data cannot be guaranteed. It is dependent on the parameters employed. EDA generally shows very strong interindividual differences (Vossel, 1990). Hence, this test might not be appropriate as a prespecified evaluation method. In addition it does not provide an outcome measure for a single session.

Some studies used a so called difference score or detect score (Schlitz & LaBerge, 1997; Wiseman & Schlitz, 1997; Wiseman & Schlitz, 1999). To obtain it, a mean or sum of all epochs of both experimental conditions per session is calculated in the same way as for the paired t-test described above. This data pair is then reduced to a single value by subtracting the values for each condition. Then a single mean t-test against zero is calculated on these session values. This procedure is in fact the same as the paired t-test. Testing data pairs with the paired t-test or subtracting them and using a single mean t-test yields exactly the same results. So advantages and disadvantages described for the paired t-test also apply to this method.

*5.4 Wilcoxon Test*

If a paired t-test, cannot be applied because the distribution of the data is unknown the nonparametric Wilcoxon Signed Rank test can be applied. So far this test has not been used in DMILS research. This Wilcoxon method differs from the one presented in section 5.2 by the level of data to which it is applied. While the Wilcxon in the two component model is applied to epoch data for calculating a session score, the Wilcoxon in this section is applied to session data for the calculation of a z-score for the whole experiment.

*Advantage*
The test requires only minimal distribution assumptions. It has a reasonable power which outperforms the PIS and the two component model in most cases.

*Disadvantage*
This method cannot provide a single session outcome measure.

*5.5 Randomized Permutation Analysis (RPA)*

Blair & Karniski (1993) have introduced a method for significance testing of waveform difference potentials. This method was developed for the significance testing of event related potentials (ERP) of different conditions in EEG research. But the procedure also fits DMILS data as the basic characteristic of the data (i.e., many-data-points, few-subjects type of problem) are more or less the same. Dean Radin has adapted this procedure in an excellent way to DMILS data. We will not describe the detailed procedure here (see the appendix of Radin, Machado, & Zangari (1998) for a full description). The basic idea of that strategy is to superimpose the data and to calculate a single outcome score for the whole experiment. Then, the assignment of the experimental conditions for at least one session is exchanged completely and the outcome score is calculated again. This procedure is repeated until all possible permutations of experimental conditions to the data have been calculated. The outcome values obtained by the permutation form an empirical distribution and the ratio of the outcome score plus the permuted scores larger or equal to the one obtained to all possible permutations give the true *p*-value (Edington, 1987).

*Advantage*

This is a 100% power test without any distribution assumptions. Therefore, it represents a perfect solution to most of the problems posed by the above mentioned tests.

*Disadvantage*

For N sessions $2^N$ permutations have to be calculated. For example, in our pilot study $2^{26}$ = 67,108,864 permutations would have had to be calculated. Radin, however, has shown that the procedure can be shortened by an approximation as the p-value converges rapidly towards the result of the full permutation. However, this test also does not provide a single session outcome.

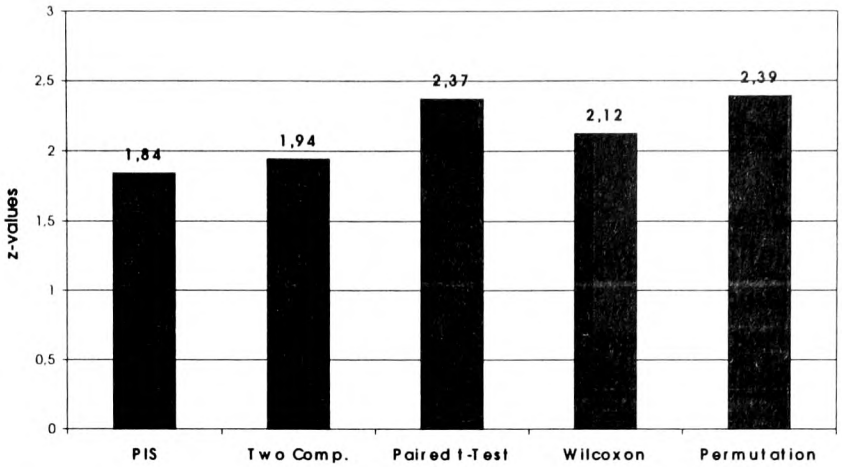
*5.6 Results*

We have applied all methods described above (except the detect score) to the data of our pilot study. Figure 6 shows the results for the data based on the tonic SCL. A Kolmogorov-Smirnov goodness-of-fit test revealed *p*-values of $p$=0.21 for the differences between calm and activate means over all epochs (per session) indicating that the empirical distribution of the differences did not depart significantly from normality. Our Random Permutation Analysis was programmed in C++ and run on SGI Unix Workstation. The program was designed to stop the permutation process as soon as the true *p*-value proved to be stable in the fourth decimal. Approx. 1,600,000 had to be calculated.

Figure 7 depicts the results for the three parameters computed for the phasic component. The Kolmogorov-Smirnov goodness of fit test revealed *p*-values of $p$=0.97 (NS.SCR.freq 0.015), $p$=0.99 (NS.SCR.freq 0.02) and $p$=0.37 (sum of amplitudes) for the differences between activate and calm means. These values justify the application of a paired t-test. The RPA analysis was run on the same aggregated data pairs that also entered the paired t-test and the Wilcoxon test.

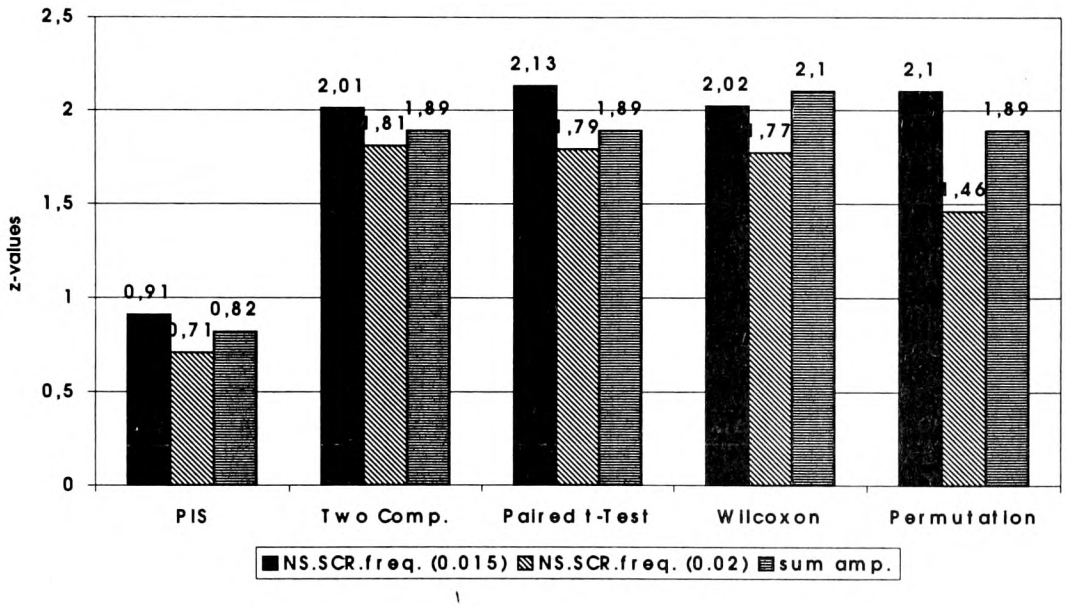
As our (psychophysiological) parameterization yields only small numbers for the parameters with large variances the PIS method has only a very low power to detect the effect. All *z*-scores are less than half of other methods' *z*-scores. All other procedures yielded approximately the same results with only minor differences.

Figure 6
COMPARISON OF ACTIVATE AND CALM DATA TAKEN FROM THE TONIC SCL USING DIFFERENT STATISTICAL PROCEDURES.




As can be seen, the permutation procedure and the paired t-test yielded the highest z-scores while the smallest z-score were observed for the traditional PIS scores.

Figure 7
COMPARISON OF ACTIVATE AND CALM DATA FOR THREE DIFFERENT PARAMETERS (SUM OF AMPLITUDES AND FREQUENCY OF NONSPECIFIC SCRS WITH MINIMUM THRESHOLDS OF EITHER 0.015 µS OR 0.02 µS) BASED ON THE PHASIC SCR USING OF DIFFERENT STATISTICAL PROCEDURES



## 6 Discussion

Our pilot study was conceptualized to test our equipment and to assess new methods in DMILS research. It yielded strong effects. The strong effects within the data gave us the chance to compare different approaches towards the evaluation of DMILS data. Fortunately, we were able to sufficiently answer all research questions for which the study was designed.

We could demonstrate effects of approximately the same size in both components of EDA. This indicates that the effect is more of a global character rather than a very specific influence. The activation effect was to be found in the slow changing SCL as well as in the amount and size of skin conductance responses. What we conclude is that the activation intention effect is related to a more global physiological state reflecting overall arousal.

This finding fits with well those regarding the influence of irregularities in respiration. Some of the changes within the phasic EDA could be clearly linked to the pulmonary system. Our data indicate that EDA responses which are elicited by pulmonary irregularities are to be conceived of a substantial part of the DMILS effect. Therefore, the link between the pulmonary and electrodermal system seems to be very important for EDA-DMILS research. If this result proves to be true, it is not necessary to exclude respiration artifacts in DMILS data.

Our results also indicated that a psychophysiological way of parameterization of the phasic DMILS data was more suitable. Our data clearly revealed that our method of using the classical psychophysiological parameters (numbers of nonspecific responses, sum of amplitudes of nonspecific responses) outperformed the method traditionally applied in DMILS/Remote Staring research. If this is replicated in other studies, it can be concluded that all experiments using the phasic EDA might have underestimated the effect due to an inappropriate parameterization.

Furthermore, we can conclude that the effect we found acted specifically on the phasic responses as the effect increased for methods of parameterization that took into account only these responses (NS.SCR.freq, sum of amp. of NS.SCR) and left the flat area between them untouched. Taking smaller responses into account by lowering the threshold for responses down to 0.015 µS yielded slightly better results than a threshold of 0.02 µS. This could be due to the fact that Psi acts more on small responses. On the other hand, the difference is to small ($z_{0.015}$=2.02 vs. $z_{0.02}$=1.77) for an interpretation, but a hypothesis for future research can be derived.

Regarding statistical procedures, the most importing finding of our pilot study is the obvious inappropriateness of the PIS method. This conclusion applies to both the interpretation of PIS as a score of amount of influence expressed in a percent value as well as to the significant testing based on these scores. We highly recommend abandoning this method for Psi research. Also the other method (two component model) employed so far in DMILS research is not an appropriate procedure as a basic assumption of the test is violated.

We favor the Wilcoxon Sign Rank test as the simplest method. It is easy to calculate and free of any distribution assumptions. This might be important since EDA data from different subjects cannot be guaranteed to have homogenous variances. If the difference scores between activate and calm epochs are normally distributed the assumptions for a paired t-test are fulfilled. This parametric testing procedure might result in a slight increase in statistical power. Full (100%) power can be reached by the permutation test, but this method is not so easily applied and tends to take much time with large session numbers. The program used here can be obtained from one of the authors (DB).

We still see a need for further development of evaluation methods within the DMILS paradigm. The aim of those methods should not be a mere significance testing of a whole data set but a more detailed approach to the data.

## 7 Conclusion

The findings of this exploratory pilot study are consistent with previous findings in DMILS research. Our results indicate EDA to be the appropriate variable to map a global activation effect that affects several physiological systems. Earlier studies might have underestimated this effect by the use of inappropriate statistics and unorthodox parameterization methods.
These exploratory findings need to be replicated in future experiments. We have decided to record respiration activity as well as tonic and phasic EDA parameters in our future studies. We regard the sum of amplitudes of all nonspecific responses being larger than 0.015 µS as the most appropriate tonic parameter derived from the phasic EDA component. The findings regarding the impact of irregularities in respiration on DMILS results will be investigated in future data set. The large field of research within EDA data calls for future studies addressing differential hypothesis towards the nature of the supposed effect.

We think that the DMILS paradigm may benefit from the approach described herein both as far as the detection of any ostensible effect is concerned as well as the acceptance of mainstream psychology is concerned.

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# A COMPARISON OF THE FEATURES OF PSYCHOMANTEUM AND HYPNAGOGIC/HYPNOPOMPIC EXPERIENCES

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**ABSTRACT**

Recent attempts to facilitate reunions with deceased loved ones using a psychomanteum chamber have found that many participants report reunion experiences ranging from a sense of presence to vivid and realistic visual encounters. Many participants consider these to be actual encounters with the deceased and find them to be very beneficial. Such experiences can also be accompanied by apparent mental or verbal communications, tactile and bodily sensations, sensations of movement and, occasionally, smells.

Although most encounters occur during psychomanteum sessions, some happen later when the participant is in the hypnagogic or hypnopompic states which occur between wakefulness and sleep and vice versa. This paper notes that there are also strong similarities between psychomanteum and normal hypnagogic/hypnopompic imagery with regard to the circumstances in which they occur and, particularly, in terms of the content and progression of the visual imagery and also the sense of reality and vividness. Sensations in other modalities are also similar in many cases.

The main difference between psychomanteum and hypnagogic/hypnopompic imagery is that in the former case the participant presumably has his/her eyes open whereas in the latter case the participant may or may not have his/her eyes open. Another difference is that, unlike hypnagogic/hypnopompic imagery, psychomanteum experiences do not tend to feature non-verbal auditory imagery. Verbal or mental communications also tend to be coherent whereas with hypnagogic/hypnopompic auditory imagery it is often unintelligible and can be nonsensical. Psychomanteum experiences also seem to be more interactive, more emotional and have more of an impact on the participants.

One possible explanation for psychomanteum apparitional experiences is that they involve hypnagogic-like imagery whose content may be strongly influenced by the needs, motivations and expectations of the participants. Further research is needed to investigate the potential influence of participants' mental set and expectations on the content of psychomanteum experiences.

In recent years, a number of researchers have been using psychomanteum chambers to try to facilitate reunions between participants and their deceased loved ones (Hastings et al., 1999; Moody, 1994; Moody with Perry, 1993; Radin & Rebman, 1996; Roll & Braun, 1995). As Moody with Perry (1993, p. 147) noted, "The word *psychomanteum*, taken literally, implies that the spirits of the dead are summoned as a means of divination so that they can be asked questions about the future or other hidden knowledge." However, the purpose of the modern psychomanteum tends to be to facilitate reunions; although the participant may ask questions and seek reassurance, the aim is not usually to seek information about the future.

Studies have found that from 22% (Roll & Braun, 1995) to more than half of the participants (Hastings et al., 1999; Moody, 1994; Moody with Perry, 1993; Radin & Rebman, 1996) have reported encounters with deceased persons during their time in the psychomanteum chamber. However, not all encounters occur during the session; some (or additional) encounters are reported later when the participant has returned home (Moody with Perry, 1993).

The psychomanteum experience appears to be generally beneficial and may help the grieving process even if strong reunion experiences are not reported (Hastings et al., 1999; Moody, 1994; Roll & Braun, 1995). Possible personality changes, such as becoming kinder, more understanding and being less afraid of

death, seem similar to those associated with NDEs (Moody with Perry, 1993). Research has also found that widows and widowers who report some form of contact with their deceased spouses, in a non-psychomanteum context, generally find them helpful (Rees, 1971).

Prior to a typical psychomanteum session, participants are asked to bring along mementoes which remind them of the particular deceased person that they wish to encounter. A facilitator then talks with the participant about the deceased and their relationship with them and then they examine and discuss the mementoes. Participants are then escorted into the psychomanteum booth, which generally consists of a mirror mounted on a wall in front of a comfortable chair. The booth itself is surrounded by a black curtain or fabric and is lit by a low-voltage light. The mirror and chair are angled so that the participant does not see their own reflection, only a reflection of darkness, as it were. Participants are then asked to relax and gaze into the mirror with the hope that the deceased person will appear within it. When they emerge from the booth, participants are asked to report and reflect upon their experience.

Reunion experiences may range from a sense of presence to seeing vivid and realistic visual images of a deceased person(s) who is either the designated person or some other known or unknown person (or occasionally an animal) (Hastings et al., 1999; Moody, 1994; Moody with Perry, 1993; Radin & Rebman, 1996; Roll & Braun, 1995). Such experiences can be accompanied by apparent mental or verbal communication, tactile and bodily sensations, sensations of movement and, occasionally, smells. A number of participants report that they feel wide-awake during the experience and they may be convinced that the deceased person(s) was actually present. It is estimated that, at first attempt, these images usually last for about a minute but may last up to 10 minutes; the duration also seems to increase as a person becomes more experienced at participating in psychomanteum sessions (Moody with Perry, 1993).

The purpose of this paper is to consider the similarities and differences between psychomanteum experiences and accounts of hypnagogic/hypnopompic imagery. Hypnagogic/hypnopompic imagery is that which occurs during the transition states between wakefulness and sleep and between sleep and wakefulness, respectively (see Mavromatis, 1987; Schacter, 1976 for reviews of this literature). Quotations from published psychomanteum accounts and from a recent survey of hypnagogic/hypnopompic experiences (Sherwood, 1999) will be used to illustrate some of these points.

The reasons for considering these two types of experience are threefold: firstly, there seems to be an implicit assumption in Moody with Perry's (1993) book 'Reunions: Visionary Encounters With Departed Loved Ones' that participants are actually in a hypnagogic state during their psychomanteum experience; secondly, some psychomanteum experiences have been reported after the session when the participant is in either the hypnagogic or hypnopompic state; thirdly, the circumstances in which psychomanteum and hypnagogic /hypnopompic imagery are reported are similar in a number of ways.

In a chapter entitled 'Creating Your Own Psychomanteum,' Moody with Perry (1993, pp. 164-183) provide some guidelines on how to facilitate psychomanteum experiences. Prior to the appearance of any visual imagery, they report that:

> Properly relaxed, your arms will feel very heavy and the tips of your fingers will tingle as though charged slightly with electricity. This tingling feeling almost always signals the beginning of the hypnagogic state. (p. 176, my underlining).

Later they advise against trying to control the imagery once it has begun:

> Attempting to direct images *after* they have begun will usually cause them to fade away. Why this happens I am not sure, but my guess is that conscious thought brings you out of the hypnagogic state of mind where these images occur. (p. 177, my underlining).

These are clear suggestions that the participant is in the hypnagogic state, at least when the visual imagery occurs. However, it appears that Moody's position may have changed with regard to links between the psychomanteum and hypnagogic experiences; in an earlier publication (Moody, 1992) he seems certain that these two kinds of experience are quite distinct:

> When I began my research with crystal gazing, I assumed that the images were hypnogogic. However, the results reported here would require a considerable expansion and reformulation of the concept of hypnogogia before they could be accommodated within that framework. (p. 119, my underlining).

> I have experimented with several altered states of awareness including hypnogogia and lucid dreams and have had hallucinations following surgery. What I experienced [in the psychomanteum], whatever it was, was in no way related to these other experiences. (p. 113, my underlining).

Unfortunately, Moody (1992) does not expand upon these views and state why he has changed his mind (if indeed he has).

Another indication that the psychomanteum may induce a hypnagogic state (perhaps too successfully) is that in Hastings et al.'s (1999) study, four participants actually fell asleep briefly during their session. One of the surprising findings, that Moody with Perry (1993) noted, is that about a quarter of their psychomanteum participants did not have their encounter until later (usually within 24 hours). Some of these encounters occurred during the naturally-occurring hypnagogic or hypnopompic states as the following examples will illustrate:

> Then I went home. That first night I started having the distinct feeling that someone was around. I would go to sleep, and it was as though I felt someone in the room. I would wake up still feeling that someone had been in there with me, but couldn't figure out who it was.
> On the second night I woke up and had a strong sense of the presence of my father in the room. I could tell that he was trying to talk to me, but I couldn't tell what he was saying. After waking up that time I couldn't go back to sleep.
> The next night it happened again. This was the third night in a row in which I went to sleep and woke up feeling a presence in the room. This time I woke up and smelled my father's aftershave lotion. (Moody with Perry, 1993, pp. 137-138).

> I went to bed about eleven-thirty, right after the late news on television, and fell asleep almost as soon as my head hit the pillow. The next thing I knew, I woke up and sat bolt upright in bed. I knew that my daughter was in the room. I looked at the clock and noticed that it was two thirty-seven A. M.
> There was Jane right there next to the bed....
> She looked wonderful. She was shining, just lit up beautifully. She was happy and sparkling. She kept telling me, "You've got to calm down. Calm down just a minute."
> I didn't hear her voice, not even a sound. But she was directing these thoughts at me, and the thoughts were so strong that it was almost like having them. (Moody with Perry, 1993, p. 140).

The circumstances in which the psychomanteum and hypnagogic/hypnopompic experiences occur are also somewhat similar; one is likely to be in a relaxed state in a darkened dimly-lit room which may be relatively quiet and free from distractions and external stimulation. In both the psychomanteum and the hypnagogic/hypnopompic states, one usually has little or no control over the beginning and ending of the experiences, though perhaps this might improve with experience (Kelly & Locke, 1981; Mavromatis, 1987). In both cases an attitude of passive volition seems to be conducive. Attempting direct control, as in some lucid dreams, can lead to termination of the experience (Moody with Perry, 1993, p. 177). In both sets of circumstances, the experiences can be extremely vivid and can be considered to be real or even hyper-real (Mavromatis, 1987, p. 30; Radin & Rebman, 1996, p. 67). Moody reported that he was quite surprised by how many participants thought their experiences were real as opposed to imaginary events.

I was so overjoyed during this whole meeting. I was so happy. There was not a doubt in the world they were there and that I saw them, and it was as real as meeting anyone. (Moody with Perry, p. 123).

They are no different from reality, I feel as if these things are actually happening to me. (hypnagogic imagery).

Individuals also tend to report feeling awake and aware of their surroundings throughout the experience. Interestingly, research has found that one of the features of hypnagogic/hypnopompic imagery experiences that may lead people into believing them to be real is that they feel awake throughout (McKellar & Simpson, 1954).

I was completely awake, and this was not a dream, it was very concrete, very here and now. (Moody with Perry, 1993, p. 138).

I'm aware that I'm not really asleep, yet. I'm aware of the room or surroundings. (hypnagogic imagery).

There may also be some uncertainty concerning the source or the location of the imagery; for example, one may not be sure whether the images are real or imaginary. In psychomanteum experiences one may also not be sure whether the deceased person (and also perhaps one's self) is actually inside or outside the mirror (Moody, 1992). There is also a case of hypnopompic imagery (see below) involving an apparition that came out of the area of light in which it had first appeared (Purcell, 1997).

I was sitting in there, and all of a sudden it seemed that these three people stepped right into the room all around me. It looked as if they stepped out of the mirror, but I felt that such a thing couldn't be, so I was shocked. I didn't know what was going on. (Moody with Perry, 1993, p. 135).

I saw a light in the far distance and scenery, little brief scenes, but then my attention was drawn to a pathway, and I knew I was to go down that way or off in that direction.
I moved on that way. I can't say I went into the mirror because I didn't notice going through it, but I know for sure I was in this other dimension. The light and other scenes were all around, but I didn't pay any attention because I knew I had to get down that passageway.
I moved on through, and I saw these three people standing off a little to my left side, and I moved up closer to them, and there I saw that it was my grandmother and my favourite aunt, Betty, who died, and this other person I didn't recognize, but a woman definitely. (Moody with Perry, 1993, pp. 122-123).

One night I awoke and looking down past the foot of the bed towards the built-in wardrobes I saw a circle of light apparently projected on the doors. The circle grew until it was about three feet in diameter at which point a face appeared in it and began to give a news summary or similar kind of account; I received the distinct impression that this, whatever it was the man was talking about, was merely the preamble to some unknown main business.
After a few moments the talking head announced that "the moment you've been waiting for" had arrived and proceeded to introduce "the penguin". This turned out to be nothing less than a giant (ie. adult-sized) bird which promptly climbed out of the frame on the wall and waddled around the end of the bed on my mother's side. (hypnopompic imagery, Purcell, 1997, p. 54).

Although visual is the most common modality reported during both psychomanteum (Moody with Perry, 1993) and hypnagogic/hypnopompic experiences (Foulkes & Vogel, 1965; McKellar & Simpson, 1954), other modalities, such as auditory, olfactory (smell), tactile, kinaesthetic (movement), and bodily sensations are also reported. A sense of presence is also quite a common feature of both experiences (Critchley, 1955; Hastings et al., 1999; Moody with Perry, 1993; Ohayon, Priest, Caulet, & Guilleminault, 1996; Radin & Rebman, 1996). A sense of the presence of one's spouse, or visual, auditory or tactile contact, is also often reported by widows and widowers (Rees, 1971). It is also quite common for a (mostly visual) apparition to follow a perceived sense of presence (Green & McCreery, 1989). Although a sense of

presence is common to both contexts, with the psychomanteum it seems that the presence is more likely to be known and positive whereas with hypnagogic/hypnopompic senses of presence it is often unknown and can be negative.

> I couldn't see her, but I knew she was there. I could feel the love of her presence. (Moody with Perry, 1993, p. 146).

> Instead I suddenly felt his presence. I didn't see him, but I knew he was standing right next to me. (Moody with Perry, 1993, p. 95).

> Pleasant, it was a deceased relative, I felt as if he was just standing there. (hypnopompic imagery).

> General awareness of presence/s in room/house with malevolent intent. (hypnagogic imagery).

With regard to visual imagery, psychomanteum and hypnagogic/hypnopompic experiences are similar in terms of the dynamic nature of the imagery and also in terms of the progression from simple formless to more complex images (Gurney, Myers, & Podmore, 1886; Leaning, 1925; McKellar, 1989; Mavromatis, 1987; Moody with Perry, 1993; Parco-Zuliani, 1986).

> I saw this mist in there, and to tell you the truth, for just a minute I thought you were going to have to call the fire department because it looked like smoke to me. I finally saw it was in the mirror, but just for an instant I thought it was smoke. Then I saw colors all over the mirror, patches of color, and I began to see scenes. Some were of my childhood. They were very realistic. Three-dimensional scenes were all around me. Some of them I recognized as things in my life, but others not. (Moody with Perry, 1993, p. 114).

> I was there some while before anything started, how long I don't know. After a while it seemed that the mirror was clouding up with mist, like swirls of fine dust. And that just vanished and I saw forms like geometrical designs floating around momentarily. (Moody with Perry, 1993, p. 126).

> Purple & gold nebulae, changing to vivid scenes of people, animals' places in varying historic periods which flash by in a montage. The scenes usually last for only a few seconds to be replaced by the next. Have also seen close-ups of faces, mouths, eyes. These vignettes are extremely detailed and more "real" than life. (hypnagogic imagery).

> Various images that sort of mutate into one another. They are very often faces of people I've never seen, or abstract colors and shapes. The images are always very fleeting and usually change into something else just as I have time to grasp what they are. (hypnagogic imagery).

There is clearly an overlap in terms of content too (Kelly & Locke, 1981). Mavromatis (1987), based on an earlier classification by Leaning (1925), identified six main categories of visual hypnagogic/hypnopompic imagery: (1) formless; (2) designs; (3) faces, figures, animals, objects; (4) nature scenes; (5) scenes with people; (6) print and writing.

As we can see from the earlier examples, formless imagery reported during psychomanteum experiences includes changes in illumination levels (Hastings et al., 1999; Radin & Rebman, 1996), clouds, smoke and mist (Moody with Perry, 1993), colours and flashing lights (Hastings et al., 1999), bright flickers, flashing specks, coloured lights and patches of colour (Moody with Perry, 1993). Patterns, shapes and geometric designs have also been reported during psychomanteum experiences (Moody with Perry, 1993) and hypnagogic/hypnopompic imagery (Gillespie, 1989; Leaning, 1925; Oswald, 1962; Parco-Zuliani, 1986)..

In terms of Mavromatis's (1987) third category, Moody (1994) reported that 35 of his 50 participants had experienced visionary encounters with deceased loved ones; of these, 25% encountered someone other than the person that they wanted to see. Interestingly, participants often report that the deceased look

different to how they did prior to their death; this difference is usually a positive one. These figures appear to move either inside and/or outside of the mirror. The figure(s) may or may not be identifiable; they may consist only of an outline or shadow of a human figure (Hastings et al., 1999; Moody, 1992; Radin & Rebman, 1996; Sherwood, 1999) or the figures may be robed or masked or obscured in some other way (Hastings et al., 1999; Sherwood, 1999).

> I felt so joyful. They looked a lot younger than when they died, more as they had in our younger years when we were all good friends. Still, there was a difference. They looked a little different, healthier you might say, or as though they had a lot of energy, a lot of life. (Moody with Perry, 1993, p. 128).

> People (often groups), both known & unknown, mainly females. (those I know aren't quite who they really are, somehow a variation) many times they seem angelic/faery in nature. (hypnagogic imagery).

Although figures are frequently reported, occasionally they may be incomplete or in some cases only isolated body parts, such as a hand or foot or a face, may be seen (Hastings et al., 1999; Moody, 1992). Such images may gradually emerge or progressively develop (Moody with Perry, 1993). Other apparitions can also consist of incomplete human figures, particularly heads and faces (Green & McCreery, 1989).

> At this point, as I gazed into the mirror, a sort of filmy, smoky substance came across the glass. Then out of this mist there was a figure forming and sitting on a sofa of some sort.
> At first I just saw the outline of the form and didn't see any details. Then, further on, maybe a minute later, the form started to show some features. And they all didn't appear at once. They were more like the computerized pictures you see on television. The face sort of filled in from the top down, and after a while, I said, "That's my mother." (Moody with Perry, 1993, p. 99).

> I knew someone was there with me, but I had no idea who. Then I saw this shape, a person forming up in the mirror. I could see him a little bit at a time. (Moody with Perry, 1993, p. 115).

> I saw him clearly, his whole body, except I didn't see his feet. (Moody with Perry, 1993, p. 120).

> I just saw his head and chest and upper abdomen area. It was not his whole form, but this was just as clear as looking at you. (Moody with Perry, 1993, p. 131).

> A foot (light skin then changed to dark skin). Hand and faint formulations of a human (?). (Hastings et al., 1999, participant 24, p. 102).

> Blackness: shadows forming and moving toward me…in the shape of human silhouettes, usually. (hypnagogic imagery).

> Figures shapes, vaguely human, moving. (hypnagogic imagery).

> Perhaps an upper extremity or hand of a person. (hypnagogic imagery).

Faces of people, who may be living or dead, have been reported during the hypnagogic/hypnopompic states (Gurney et al., 1886; Leaning, 1925; McKellar, 1957; Mavromatis, 1987; Oswald, 1962); Leaning (1925) pointed out that one noteworthy characteristic of hypnagogic faces is that they may appear from mist or smoke or appear within a circle of light (see also Purcell, 1997, example). Hypnagogic faces may also appear to be talking to you but no sound is heard (Leaning, 1925).

> First I saw her from a long distance away, and it was just her face. Then, as she came closer and closer, she was more ghostly, but not in a haunting way. She was not as bright and not as solid. Plus there was a kind of smokiness around her. (Moody with Perry, 1993, p. 133).

I saw an array of soft colored twinkles floating around and around. In the center was my grandmother smiling and waving at me. (hypnagogic imagery).

Apparitions of animals have also been reported during psychomanteum (Moody with Perry, 1993; Radin & Rebman, 1996) and hypnagogic/hypnopompic experiences (Leaning, 1925; Purcell, 1997).

Then I saw a peacock. It was facing away from me. Then it turned around, and I was overwhelmed by the colors. It turned and spread its feathers out. It was huge!
It seemed to have a human face, although I couldn't see exactly what the face looked like. (Moody with Perry, 1993, p. 154).

Birds flying very fast back and forth over me. (hypnopompic imagery).

Spiders - usually one and I'll swear it's in the bed with me. (hypnagogic imagery).

Landscapes and other scenes are common to both types of experience (Hastings et al., 1999; Leaning, 1925; Mavromatis, 1987; Moody, 1992; Moody with Perry, 1993). Images of scenes involving people are also reported in the psychomanteum (Moody, 1992; Moody with Perry, 1993) and hypnagogic/hypnopompic states (Mavromatis, 1987); these may or may not relate to previous experiences from one's own life. Hypnagogic/hypnopompic imagery that is linked to previous experience has been referred to as 'perseverative'; that which does not has been referred to as 'impersonal' (McKellar, 1957; McKellar & Simpson, 1954).

Then I saw colors all over the mirror, patches of color, and I began to see scenes. Some were of my childhood. They were very realistic. Three-dimensional scenes were all around me. Some of them I recognized as things in my life, but others not.
One was of my father a long time ago, sitting on the porch steps. I remembered that happening, so this was just a memory but a clear memory, right out in front of me. I could almost touch it. I felt like I could anyway. But I didn't feel he was there; this was just a memory in the mirror.
There were scenes, too, of places I have never been to or seen. Very pretty places. I don't know where they were or what this was, but I got to thinking that the scenes were all around me on the sides, so I was in the mirror. (Moody with Perry, 1993, p. 114).

Primarily images of places, whether unknown or familiar ones. (hypnagogic imagery).

Sometimes a scene, like a seashore or whatever. (hypnagogic imagery).

I begin dreaming before I am asleep. Different landscapes appear, people wander in and out and the interactions are as if I am watching a movie. (hypnagogic imagery).

Earlier life experiences. (hypnagogic imagery).

Things that I am thinking about or things that have happened earlier in the day. (hypnagogic imagery).

I have not yet found any published accounts of print or writing appearing during mirror gazing.

Although some form of communication with the deceased is usually reported during psychomanteum sessions, participants often find this difficult to describe and it is not always clear whether it is auditory or mental in nature (Moody with Perry, 1993). Moody estimated that complex communications took place in nearly half of the reported encounters in his sessions. Sometimes these communications can be more one-sided than interactive. It seems that only in a minority of cases (c. 15%) do participants feel that they actually heard what the deceased was saying; more frequently the communication is reported to involve

some form of mental telepathy (Moody with Perry, 1993). It is not clear whether the nearby facilitator has ever heard anything during these purportedly auditory encounters.

Common forms of auditory hypnagogic/hypnopompic imagery include hearing voices speaking and calling one's name (e.g., McKellar & Simpson, 1954; McKellar, 1957; Mavromatis, 1987; Schacter, 1976). However, hypnagogic/hypnopompic communications appear to be shorter and more one-sided. In addition, hypnagogic/hypnopompic speech is not always intelligible and may occasionally be nonsensical too (e.g., Isakower, 1938). Another potential difference in auditory imagery is that during the hypnagogic/hypnopompic states the imagery often includes non-verbal content, such as ringing and bells (Leaning, 1925; Mavromatis, 1987; Oswald, 1962; Schacter, 1976), percussive sounds (Critchley, 1955; Mavromatis, 1987; Mitchell, 1890; Oswald, 1962; Pearce, 1989), music (Leaning, 1925; Schacter, 1976), footsteps, humming and buzzing, transport sounds, and motors and machinery (Sherwood, 1999). These non-verbal images do not seem to be a feature of psychomanteum experiences.

These psychomanteum communications usually involve some kind of reassurance either relating to the well-being of the deceased or the way in which the participant has been coping with the loss and getting on with their life. Answers to problems or questions have also been reported during the hypnagogic/hypnopompic states (Sherwood, 1999).

> "How are you?" I asked.
> Her lips didn't move, but I got a mental communication from her in which she said, "I'm fine and I love you."
> I asked her another question: "Was there any pain when you died?"
> "None at all," I could hear him say. "The transition to death was easy."
> At first I verbalized my questions, just said them right out loud. But before I got a few of the questions out, the answer would come back to me in a mental form. There was no sound of her speaking, I just knew what she was saying. (Moody with Perry, 1993, p. 99).

> After what I guess was no more than five minutes I began to hear the voice of this friend of mine who was killed in a boating accident. It was just like her speaking to me. I'm not talking here about thoughts or daydreams or imagination. I've never heard anything like it.
> She just talked to me and said it was wonderful where she was. I could hear each word plainly and separately. There was a quality to it, like an echo, I believe, like maybe she was speaking through a tin tube. It was her voice, though, definitely. (Moody with Perry, 1993, pp. 144-145).

> I have heard people calling my name and trying very hard to tell me something….I have yet to find out what they are trying to say though because my own fear tends to block it out. (hypnagogic imagery).

> Once (the only time I can recall) I was falling to sleep and I was talking-more like mumbling-about something to do with a fire (I didn't know I was doing it) until I heard a boy's voice answer me in my head (someone I recognized from school) with an amused voice and was asking me about what I was mumbling about and he said something like what about the fire? and this woke me up since I'm not used to hearing voices and I jumped up and looked around half expecting some one to be there when they weren't. What's really weird is the next day - the class that I have with the boy - a fire drill went off and it really spooked me. (hypnagogic imagery).

ESP has also been reported during the hypnagogic/hypnopompic states and may be coupled, in some cases, with the appearance of crisis apparitions (e.g., Gurney et al., 1886). Some experimental studies have also suggested that hypnagogic/ hypnopompic imagery might be conducive to telepathy (Braud, 1977; Gertz, 1983; Schacter & Kelly, 1975; White, Krippner, Ullman, & Honorton, 1971). The ganzfeld procedure, which is believed to induce a hypnagogic-like state, has also provided some of the best evidence for ESP but there is disagreement over the nature of these experimental findings (e.g., Bem & Honorton, 1994; Bertini, Lewis, & Witkin, 1969; Hyman & Honorton, 1986; Milton & Wiseman, 1999).

In terms of imagery in other sensory modalities, olfactory imagery is rare in both hypnagogic/hypnopompic (Leaning, 1925; Mavromatis, 1987; Mitchell, 1890) and psychomanteum experiences, although a participant in Hastings et al.'s (1999) study did report the smell of incense and one of Moody's smelt their father's aftershave (Moody with Perry, 1993). Sensations of being touched, hugged or held have been reported in the psychomanteum (Hastings et al., 1999; Moody with Perry, 1993) and during the hypnagogic/hypnopompic states (Sherwood, 1999). As with hypnagogic/hypnopompic examples (Sherwood, 1999), the tactile sensations reported during the psychomanteum tend to be passive rather than active. This passivity seems to apply to other apparitions too (Green & McCreery, 1989; Tyrrell, 1953/1973).

I was so happy to see him that I began to cry. Through the tears I could still see him in the mirror. Then he seemed to get closer and he must have come out of the mirror because the next thing I knew he was holding me and hugging me. (Moody with Perry, 1993, p. 93).

So I tried to relax, but I could never physically see her. But I felt her! I felt her kiss me on the cheek the way we always did when she was alive. (Moody with Perry, 1993, p. 146).

I sensed her presence and her holding me while I experienced my sadness. (Hastings et al., 1999, participant 28, p. 102).

As if a hand touches my leg, my arm or other parts of my body. (hypnagogic imagery).

Someone kissing my neck. (hypnagogic imagery).

I can also sense love and someone hugging me...things like that. (hypnagogic imagery).

Bodily sensations of energy flowing through the body, warmth, tingling hands and bodily jerks have all been reported during the psychomanteum (Moody with Perry, 1993; Radin & Rebman, 1996) and during the hypnagogic/hypnopompic states (Leaning, 1925; McKellar, 1957; Oswald, 1959, 1962; Sherwood, 1999). The tingling hands appear to be a feature that participants should expect prior to their psychomanteum experience (Moody with Perry, 1993, p. 176).

Alternating waves of light and dark, silence and sound, and internal energy waves. (Hastings et al., 1999, participant 37, p. 103).

I became extremely warm, and I didn't know if that was because I was so excited or if it was the energy from around her. (Moody with Perry, 1993, p. 133).

There was an intense warmth (physically / spatially) around me. (Hastings et al., 1999, participant 37, p. 103).

I stayed as relaxed as I could and just looked at her. My hands were tingling, and I could feel my heartbeat pick up speed. (Moody with Perry, 1993, p. 89).

I felt a kind of jerk or shudder, vertigo, like maybe I was going to get dizzy, but I didn't. (Moody with Perry, 1993, p. 126).

Something like an electric shock that passes through me very fast. (hypnagogic imagery).

The passing of energy through my body. (hypnagogic imagery).

Incredible heat, extreme cold. (hypnagogic imagery).

Tingling feeling in arms hands feet, and legs, although not at the same time. (hypnopompic imagery).

Sometimes my arms and/or legs will involuntarily jerk really forcefully and very seldomly my entire body will jerk. (hypnagogic state).

Participants have also reported sensations of movement, such as moving forward or being drawn backward, walking or gliding, often apparently into or through the mirror (Moody with Perry, 1993). Similar sensations have been reported during the hypnagogic/hypnopompic states (Sherwood, 1999).

> I saw a light in the far distance and scenery, little brief scenes, but then my attention was drawn to a pathway, and I knew I was to go down that way or off in that direction.
> I moved on that way. I can't say I went into the mirror because I didn't notice going through it, but I know for sure I was in this other dimension. The light and other scenes were all around, but I didn't pay any attention because I knew I had to get down that passageway.
> I moved on through, and I saw these three people standing off a little to my left side, and I moved up closer to them, and there I saw that it was my grandmother and my favourite aunt, Betty, who died, and this other person I didn't recognize, but a woman definitely. (Moody with Perry, 1993, pp. 122-123).

> I moved forward, not with a lurch but smoothly, almost gliding. I went right into the mirror, moved right on through.... All of a sudden I was walking, or felt that I was walking, out onto this platform, and as I did so, they lit up and came toward me, but only so far....
> I felt so happy, and I knew they did too. Then suddenly I was drawn backward, and I saw them receding off into the distance again and I felt myself sitting in the chair again. (Moody with Perry, 1993, pp. 126-128).

Going forward. Or being forced to go forward. (hypnagogic imagery).

Floating, rising, gliding, sometimes slow other times fast. (hypnagogic imagery).

Walking, running. (hypnagogic imagery).

The most apparent difference between psychomanteum and hypnagogic/hypnopompic experiences is that during the psychomanteum the participant presumably has his/her eyes open (Kelly & Locke, 1981) whereas in the majority of hypnagogic/hypnopompic imagery experiences the participants' eyes are closed (Leaning, 1925; McKellar, 1989; McKellar & Simpson, 1954). Psychomanteum experiences also seem to be much more interactive; during hypnagogic/hypnopompic experiences one tends to be much more of a spectator. Perhaps this is a reflection of the differing motivation of participants in these differing situations?

Psychomanteum experiences also seem to be more emotional and have more of a profound effect on people than hypnagogic/hypnopompic experiences. Perhaps this is not surprising given the purpose of the psychomanteum? Nevertheless, hypnagogic/hypnopompic experiences are often remembered for long periods of time, much more so than dreams. My impression is also that the visual images of faces and figures during the psychomanteum seem to be more stable than similar hypnagogic/hypnopompic examples.

There is evidence to suggest that both psychomanteum and hypnagogic/hypnopompic experiences can be given paranormal interpretations (Hastings et al., 1999; Moody, 1994; Moody with Perry, 1993; Sherwood, 1998). Apart from the possibility that apparitional experiences may be real encounters with deceased persons (e.g., Stevenson, 1982), telepathic explanations have also been proposed, for example by Gurney, Myers or Tyrrell (see Irwin, 1999). However, these latter theories are more successful at explaining living and crisis rather than post-mortem apparitions (Irwin, 1999). Post-mortem apparitions could perhaps be explained by "the 'super-ESP' hypothesis, which attributes the phenomena to vast extrasensory powers possessed by persons still alive." (Gauld, 1977, p. 578) but until we are certain if and how ESP operates it is difficult to say whether or not such a 'super' form is plausible. Much of the information communicated in the psychomanteum sessions is quite general and/or is information that the

participant is likely to have known already. Useful future research could attempt to obtain specific veridical information that the participant could not have known in an effort to establish the possibility of ESP.

I think that one potentially non-paranormal alternative explanation for psychomanteum experiences is that some of them may be cases of hypnagogic-like imagery. The content is probably strongly influenced by the needs, motivations and expectations of the participants (which may be linked also to a desire to reward the researcher for the significant amount of time that he or she has invested in the session). We know, from research into hypnagogic/hypnopompic imagery, that one's thoughts and feelings at a given moment can be translated into visual or auditory imagery (Silberer, 1965, cited in Schacter, 1976; Sherwood, 1999). I think the potential influence of the participants' mental set and expectations is something that definitely needs to be investigated to see whether it can influence the content of subsequent experiences in a psychomanteum chamber. However, for ethical reasons, such investigations should, perhaps, be conducted with a more neutral purpose in mind.

The question of whether apparitions are subjective or objective is by no means a new one. According to Gauld (1977), many parapsychologists consider apparitions to be purely hallucinatory and not objectively real. However, this view might be challenged by purported photographic evidence, by cases of apparitions that seem to have the characteristics of physical objects (such as being able to block views and cast shadows and reflections in mirrors), by cases where veridical information is obtained but, in particular, by cases where apparitions are 'seen' by more than one person simultaneously (Gauld, 1977, Irwin, 1999, p. 255).

A potentially interesting avenue of research would be to have more than one person sitting in the psychomanteum chamber at a time. This is something that Moody (1992) is proposing to investigate. If both saw the same imagery at the same time then this might lend some support to the possible objectivity of the phenomena, though of course both parties could still be influenced by their expectations and possibly by information provided earlier by the facilitator. There might also be potential conformity issues too. As it is, the similarities between psychomanteum experiences, hypnagogic/hypnopompic imagery and other forms of imagery, such as ganzfeld (Bertini et al., 1969), sensory deprivation (Bexton, Heron, & Scott, 1954; McKellar, 1957; Reed ,1974), drug-induced (Ardis & McKellar, 1956; Klüver, 1928, cited in Mavromatis, 1987; Schacter, 1976) and crystal gazing imagery (Leaning, 1925) lead me to consider the psychomanteum apparitional experiences to be subjective and imaginal rather than objective and in some sense physically present.

However, perhaps these apparitions are neither completely subjective or completely objective? Based upon their discovery of an apparent link between environmental and physiological variables during psychomanteum sessions, Radin and Rebman (1996) "postulate that some apparitions—metaphorically speaking—are short-term vortexes caused by disturbances in a three-way equilibrium [between mind, body and environment]. When the disturbed state is allowed to rebalance, the apparition dissolves back to where it came from." (pp. 81-82).

Regardless of whether or not psychomanteum experiences do involve genuine communication with the dead, I think that they are still worthy of further investigation. If they are not genuine communications, at least we can learn something useful about this kind of imagery and perhaps the specific conditions that lead to its appearance.

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# PERSONALITY CORRELATES OF ANOMALOUS EXPERIENCES, PERCEIVED ABILITY AND BELIEFS: SCHIZOTYPY, TEMPORAL LOBE SIGNS AND GENDER

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## ABSTRACT

This investigation considered personality variables in relation to anomalous experiences, beliefs, abilities, fear of the anomalous and anomalous experiences associated with drug use (as assessed by the Anomalous Experience Inventory). These were Schizotypy (as assessed by the STA scale of the STQ) and Temporal lobe lability (as assessed by the CPES scale of the Personal Philosophy Inventory). A literature review reveals that non-clinical high scorers in both these groups have previously been found to report more subjective paranormal experiences and anomalous beliefs. Gender and gender role (as assessed by the BEM sex role inventory) were also considered as mediating variables from the observation that females often report more anomalous beliefs and experiences than males.

There have been few surveys which have assessed both experience and belief in anomalous phenomena. To this end, this survey was designed to observe responding for belief and experiences within the same population and to replicate and extend previous findings in terms of how schizotypy, temporal lobe signs and gender interact with one another in terms of the subscales of the AEI. Specifically, it was deemed important to look for predictors of belief in anomalous phenomena.

A computerised survey was conducted among 145 undergraduate students at University College Northampton. Data were compared for sex and gender role differences in subscales of the AEI and the schizotypy scale. It was found that although females and to a certain extent those with a feminine gender role scored higher than males on the AEI items, there was only a significant difference between the genders and gender roles for fear of the anomalous. There was also significant difference between the genders (but not gender role) on scores on the schizotypy scale.

A correlation matrix was constructed of the relationships between all the variables. Positive and significant correlations were found between many of the variables in the correlation matrix. Schizotypy significantly correlated with anomalous experience, anomalous belief, anomalous ability, fear of the anomalous, drugs taken, sex role and complex partial epileptic like signs. Complex partial epileptic signs significantly correlated with schizotypy, anomalous experience, anomalous belief, and anomalous ability. Anomalous experience, belief and ability were also all positively and significantly correlated with one another. Many of these correlations held up following a Bonferroni correction of the alpha level and the removal of items on the schizotypy scale that referred to anomalous phenomena or beliefs. The relationships between the variables were further delineated by means of an exploratory path analysis (undertaken by a series of stepwise multiple regression analyses), with anomalous belief as the dependent variable in the first step. The path analysis was carried out and a model constructed which provides an explanation of how personality might interact with anomalous experience, perceived ability and belief. The results of the analysis were discussed in terms of *how* the relationships revealed might be understood.

## INTRODUCTION

The incidence and prevalence of anomalous experience and belief in the general population is far from uncommon. For example, a recent survey (Gallup and Newport, 1991) found that 93% of all Americans surveyed reported believing in at least one in a list of 18 paranormal experiences. This observation fuels the current thinking in parapsychology that anomalous experiences and beliefs should be studied as variants of an array of human experiences - which occur irrespective of the objective existence and validity of such phenomena (e.g. Irwin, 1993).

According to common sense, beliefs are fluid rather than fixed and are susceptible to alteration in the light of experience. This has been demonstrated experimentally where anomalous belief was found to be a consequence rather than a cause of experience (Lawrence, Edwards, Barraclough, Church and Hetherington, 1995). Direct and personal experiences are likely to be the type of experiences involved in shaping beliefs in the paranormal. It would be interesting to ascertain who - in terms of personality type(s) - is more likely to have an anomalous experience and within this population, who will attribute the experience to the paranormal. It would also be interesting to see how such personality types relate to one-another and to anomalous belief. From both experimental work and spontaneous cases it seems that states of consciousness where there are confusions between reality and imagination are conducive to at least subjective psi experiences (e.g. see Blackmore and Rose, 1997). A person who experiences anomalous phenomena is likely to be someone who is more likely to hallucinate whilst being subjectively awake and who may often experience states of confusion between reality and imagination. This person is also likely to attach intense meaning to an experience.

Paranormal experiences seem to be common among clinical groups such as schizophrenics (Greyson, 1977). Indeed, paranormal beliefs have been included as items both as part of an earlier DSM classification of schizophrenia (DSMII) as well as the magical ideation scale of Eckblad and Chapman (1983) which is a measurement scale of one aspect of schizophrenia. Direct evidence of a link between schizophrenia itself and higher levels of belief in and experience of anomalous phenomena has been demonstrated by several authors in the literature. For Example, Thalbourne, (1998) found that schizophrenics have higher levels of belief and experience compared to a control group. Jackson (1997) also found a significant difference between a clinical and control group on their scores on 'numinous mystical experience' scale ( comprised of experiences of ESP and a guiding presence). Blackmore (1986) found that schizophrenics had experienced more apparitions, deja vu experiences etc. but not more OBEs than controls. Overall, there does seem to be a pattern among these individuals which warrants further attention.

With regard to veridical psi experiences, the findings in the literature are mixed, with some authors finding no extra chance effects (e.g. Greyson, 1977) and others finding significant effects in clinical groups other than schizophrenics (see Ullman, 1977 for a review). There is undoubtedly a link between the cognition of those suffering from schizophrenia (and perhaps other mental illnesses) and subjective paranormal experiences. However, it seems unlikely, given the high levels of belief and experience demonstrated in the literature that *all* those reporting such experiences and beliefs suffer from mental illness (cf. Parker, 1993). Another way of approaching the question would be to take the dimensional approach toward mental illness and refocus our attention to *schizotypy*.

This approach is currently advocated by many UK researchers, in particular Claridge (e.g. Claridge, 1997) and implies that forms of mental illness are not distinct and that mental health and mental illness share common traits but differ in terms of trait level. We can therefore consider schizotypy as the normal analogue of schizophrenia, a personality dimension along which the normal population may be ranged. The literature reveals considerable similarities in cognition between schizophrenia and schizotypy (e.g. Jackson, 1997). Jackson (1997) and McCreery (1996) have highlighted the positive aspects of being a high scoring – 'benign' or 'happy'- schizotype who are often highly creative (Brod, 1997) and have adaptive mystical experiences (Jackson, 1997).

The Magical Ideation Scale correlates with the Australian Sheep-Goat scale of belief in the paranormal (Thalbourne, 1985; Thalbourne and Delin, 1994; Thalbourne, 1994; Thalbourne and French, 1995) and the Paranormal Belief Scale (Tobacyk and Wilkinson, 1990) and the Survey of Belief in Extraordinary phenomena (Thalbourne and French, 1995) as well as the Anomalous Experience Inventory (Gallagher,

Kumar and Pekala, 1994). These relationships might be predicted when one considers the paranormal items in the Magical Ideation Scale, but the relationship appears to hold up even when paranormal items are removed (Thalbourne, 1984). This indicates that there is something about the cognitive style of high scorers (on scales measuring positive aspects of schizotypy[1]) which is related to beliefs in anomalous phenomena. Thalbourne (1994) also found that there was a correlation between the Perceptual Aberration Scale (which is a different measure of positive schizotypy) and the Australian Sheep-Goat Scale. In terms of experiences, Claridge and Brok's (1984) STA scale of their STQ has been found to correlate with numinous mystical experience (ESP, guiding presence) (Jackson, 1997) and with the psi related OBE. (McCreery, 1997). McCreery and Claridge (1996) found that high scorers on the STA schizotypy scale show a greater responsiveness to an experimental situation designed to facilitate spontaneous imagery and hallucinations which lead to an increase in anomalous experiences. There is not much in the literature assessing the link between schizotypy and veridical psi performance. However, Magical Ideation and Transliminality[2] (Thalbourne, 1999 - a factor which includes schizotypy alongside other variables) were both found to be predictor variables in attaining telepathy hits in a Ganzfeld paradigm (Parker and Westerlund, 1998). This effect held up even where the paranormal items were removed from the Magical Ideation scale. This pattern was repeated where high and low schizotypes attained 61% and 12.5% hit rates, respectively, in a Ganzfeld paradigm (Lawrence and Woodley, 1998). However, in a precognition paradigm (Beloff's Consumer's Choice ESP test - see Thalbourne, 1998) Transliminality was not found to be a significant predictor of performance (Thalbourne, 1998). This was discussed in terms of the type of psi task employed, although it seems more likely to be because Transliminality in this investigation did not include a schizotypy scale.

There are two possible explanations for anomalous experiences in schizotypes: Firstly, that they have more access to lower levels of cognitive processing for example, hunches, dreams, impulses, etc.[3] which may be misattributed as veridical psi. This might occur via confusion between reality and imaginative processes and attribution of meaning to coincidence in the objective external world. Alternatively, schizophrenics and schizotypes may actually experience more veridical psi due to more psi conducive reality imagination confusions and access to lower levels of processing[4]. Whether high scoring schizotypes experience veridical paranormal phenomena more than low scoring schizotypes is interesting, but whatever the case, experiences attributed to the paranormal are widespread among this population.

Temporal lobe epileptics are another group who seem to both experience anomalous phenomena and hold paranormal beliefs. For example, Persinger (1988) has described how limbic seizures have been coupled with a wide range of subjective psi experiences. This idea is reflected in the brain stimulation work of Penfield and Hughlings-Jackson which has resulted in the direct elicitation of subjective paranormal experiences (Kolb and Whishaw, 1996). It is also apparent that the times of day when limbic seizures are

[1] Schizophrenic cognition comprises two types of thought, traditionally conceived as 'positive' and 'negative' in form. In very simple terms, 'positive' traits refer to *extra* features of cognition, for example, hallucinations and delusions. 'Negative' traits, on the other hand refer to a *lack* of features of cognition for example apathy and anhedonia (lack of sensation). This dichotomy is an oversimplification of the disorder but is adequate for a description of general features of schizophrenia and schizotypy.

[2] Transliminality refers to the ease with which information crosses the threshold interface between the conscious and subliminal mind in certain individuals.

[3] There is evidence for this. E.g., there is a relative weakness of inhibitory mechanisms in the schizotypal nervous system (McCreery and Claridge, 1996). This also fits with Thalbourne's idea of transliminality – see footnote 2.

[4] This idea fits with Honorton's theory that psi is available to all and may be registered if sensory and cognitive noise is reduced (e.g. Honorton 1977)

most likely clearly map onto the times of day when spontaneous psi experiences are reported (Persinger, 1988).

As with the previous discussion on schizophrenia and schizotypy, it is unlikely that all individuals reporting anomalous experiences and holding paranormal beliefs suffer from this form of epilepsy. The dimensional perspective is therefore revisited here whereby 'temporal lobe lability' is understood to be a personality variable ranging from normals through to clinical groups such as epileptics (Persinger and Makarec, 1993). Temporal lobe lability may also vary within the brain of an individual and is affected by various experiences, such as fasting, meditation and the consumption of certain drugs (see Persinger and Makarec, 1987). Scoring high on scales measuring temporal lobe lability has been found to correlate with a variety of measures of anomalous experience and belief in the normal population. Scoring high on the complex partial epileptic signs (CPES) subscale of the Personal Philosophy Inventory has been correlated with paranormal experiences and with a sense of presence (Persinger and Makarec, 1987); belief in past life or reincarnation (Persinger, 1996), paranormal belief (Persinger, 1993; Skirda and Persinger, 1993), and peak experiences and paranormal beliefs (Morneau, Macdonald, Holland and Holland, 1996) as assessed by the Paranormal Belief Scale (Tobacyk and Milford, 1983). High CPES scores were also found to correlate with dichotic listening errors and paranormal beliefs (Skirda and Persinger, 1993). This implies cognitive interference due to activation of the same brain area underlying both belief in the paranormal and dichotic listening - the temporal lobe. A related finding is that in laboratory studies which have simulated the burst firing of limbic (hippocampal and amygdaloid) neurons by transcerebral stimulation, it was possible to discriminate believers in reincarnation from disbelievers in terms of subjective anomalous experiences (Persinger, 1996). As with the discussion of schizotypy, there are two possible explanations for anomalous experiences in this group. Firstly, such individuals are experiencing hallucinatory altered states of consciousness due to the lability of the limbic structures in the temporal lobes whereby strange experiences are imbued with more meaning and potentially misattributed as veridical psi[5]. Alternatively, such experiences may actually be genuine psi experiences in themselves or a result of the confusional state of consciousness between reality and imagination, which may be psi conducive (see Blackmore and Rose, 1997). Although the actual psi ability of those scoring high on these scales has yet to be assessed, the relationship between temporal lobe lability and belief and experiences attributed to the paranormal are widespread among this population.

Another variable which seems to relate to anomalous belief and experience is gender. Irwin (1993) reviewed the literature on the correlates of paranormal belief and concluded that in the majority of cases, women seem to score more highly than men on most paranormal belief items. Women hold higher belief than men in ESP (particularly telepathy), superstitiousness, astrology, hauntings, psychic healing, reincarnation and traditional religious beliefs. Men, however hold stronger beliefs in more technical phenomena such as UFOs and extraordinary life forms. Persinger and Richards (1991) for example, found more women believed in psi phenomena, witchcraft and spiritualism than did men who believed more in extraterrestrial life forms in their sample. In terms of anomalous behaviour, more women than men have been found to attend psychic readings (Roe, 1997), although research in this area is rather limited.

This pattern of response is seemingly mirrored in some investigations which have assessed subjective paranormal experiences (e.g. Palmer, 1979). Sex differences were not, however, found to be statistically

[5] The hippocampus is involved in the normal attribution of meaning to events. 'Sensory-limbic hyperconnectionism' in the brains of epileptics and those scoring high on scales measuring temporal lobe lability may cause the person to attach odd or unusual experiences, beliefs and ideas with emotional and sometimes cosmic significance (Skirda and Persinger, 1993). Thus, coincidences may be experienced as meaningful anomalous phenomena.

significant for any of the psi related variables in this survey, although there were more waking ESP experiences reported in females compared to males to a degree which approached significance (48% of females compared to 34% of males, P= 0.052). Women reported more 'sense of presence' experiences than men in a partial sensory deprivation and transcerebral stimulation (to simulate the burst firing of limbic neurons) investigation (Tiller and Persinger, 1994); significantly more women than men believed they had lived a previous life (Persinger, 1996) and the mean score for all subjective anomalous experience in a sensory deprivation paradigm were significantly higher for women than for men (Tiller and Persinger, 1994), females also scored significantly higher than men on the numinous experiences scale which comprises phenomena such as ESP and a guiding presence (Jackson, 1997).

There does not, however seem to be a gender difference in scores on the CPES scale (e.g. Persinger and Makarec, 1993). With regard to schizotypy in the normal population, females have often been found to score higher than males (Claridge and Broks, 1984; Mason, Claridge and Williams, 1997). However, schizotypy is a multidimensional construct and males have been found to score higher than females on certain negative aspects of schizotypy (Miller and Burns, 1995). This implies that females are more likely to score higher on schizotypy items which relate to positive symptomology of schizotypy.

These gender differences might have both biological and social underpinnings with regard to anomalous experiences. These are probably mutually important in understanding anomalous experiences and beliefs and to this end it would be of interest to look at a measure of gender role in conjunction with biological gender. The different cognitive styles of schizotypes and temporal lobe labiles might be differentially modified by the effect of gender and it will be interesting to see how all these variables interact in our sample.

The current survey investigation will assess paranormal beliefs and experiences within and between the personality groups outlined above. This was deemed important in order to replicate and extend previous findings in the literature and observe how personality variables interact with one another in terms of anomalous experience, belief and perceived ability. It is apparent that many questionnaire studies have focused on paranormal belief *or* experience but both facets of attitude development are *equally* of interest. Therefore, to this end, a questionnaire, which assesses experience, belief and ability, was selected and a survey planned among the same sample group to assess how these variables inter-relate with one another.

*Aims and predictions*

The aims of this survey were to assess the relationship between anomalous beliefs, experiences and perceived abilities alongside the personality measures of schizotypy, complex partial epileptic like signs, gender and gender role in a selected sample. There are several hypotheses in this survey:

H1: Schizotypy will positively correlate with paranormal experience, belief and perceived ability

H2: The number of CPES items endorsed will correlate with paranormal experience, belief and ability and schizotypy

H3: There will be a gender difference in scores on the schizotypy scale (females will score higher than males)

H4: There will be a gender difference in scores on the anomalous experience, belief and ability and fear of the anomalous; females would be expected to score higher than males on the subscales of the belief, experience and perceived ability.

H5: There will be a gender role difference in s cores on the schizotypy scale (female gender role will score higher than male gender role).

H6: There will be a gender role difference in scores on the Subscales of the AEI.

An exploratory path analysis of all variables included in the survey will also be undertaken with no particular expectations in order to explore the relationships between these variables.

## METHOD

*Design*

The study was correlational in design. All participants completed the same battery of questionnaires.

*Participants*

One hundred and forty five first year psychology undergraduate students took part. Participants were opportunity sampled as the survey was carried out in research methods classes at University College Northampton. There were 41 males and 104 females[6] whose ages ranged from 18 to 54. the mean age was 20.4 and the standard deviation for age was 5.1. The data for one respondent was completely removed from the analysis while some were removed from individual questionnaire data[7]. Cases available for analysis were 144 comprising 41 males and 103 females. Two students arrived late and therefore did not take part in the survey. The response rate for the survey is therefore 97.93% which is close to 100 percent of the sample taking part.

*Equipment and measures*

Questionnaire measures were put onto the computer system in the division of psychology at University College Northampton. The computer program was written within the Division of Psychology originally for course evaluation and class data generation exercises. Responses were saved automatically to a Microsoft Access V1.0 database and a different database was created for each scale. Questionnaires were presented in the following order:

*The Complex partial epileptic like signs scale of the Personal Philosophy Inventory (Persinger and Makarec 1987).*
Labelled 'The Perceptual Attribution Scale' in this investigation. The complex partial epileptic like signs scale has 16 true or false response options which measure an aspect of temporal lobe lability.

*The BEM Sex Role Inventory - BSRI ( Bem, 1974).*
This inventory measures the extent to which individuals describe themselves as feminine or masculine in terms of societal stereotypes (Bem 1974). The inventory comprises three scales; a Masculinity scale, a Femininity scale and a Social Desirability scale, each one comprising 20 items making a total of 60 items in the BSRI.

*The Anomalous Experience Inventory (AEI) (Gallagher , Kumar and Pekala, 1994).*
This is a questionnaire comprising a total of 70 items. Within the AEI there are several sub-scales which measure anomalous experience (29 items), anomalous belief (12 items) anomalous ability (16 items), fear of the anomalous/paranormal (6 items) and use of drugs (7 items).

*The STA scale of the STQ schizotypy scale (Claridge and Broks, 1984).*
Labelled 'The Claridge Personality Questionnaire' in this investigation. The STQ questionnaire comprises 2 scales, the STA and the STB, which measure schizotypal personality and borderline personality

[6].Nearly 100% of the sample frame completed the survey investigation. The unequal representation of the sexes reflects the normal ratio among psychology undergraduates at UCN and not a selection bias.
[7] At the end of each questionnaire there was an option as to whether respondents wanted their data to be included in the study, these individuals clicked no.

respectively. The STQ was devised by Claridge and Broks (1984) as a clinical instrument to investigate the incidence of schizophrenic symptoms in a normal population. It was written directly from criteria specified in DSMIII for defining borderline syndromes of schizotypal personality disorder and borderline personality. The STA is a 37-item scale which measures level of schizotypal personality in the general population.

*Procedure*

Participants were asked if they would take part in the survey, which would take no longer than 20 minutes. Each sat at a computer terminal and accessed the questionnaire program by double clicking on an icon. On entry to the program, identification and demographic information was requested and the user was asked which scale they wished to answer (selected by highlighting and clicking on the one required). The questionnaire then proceeded page by page including instructions prior to each scale. Once each scale had been completed the user was asked to confirm that they wished their answers to be used in the study therefore all participants had the opportunity to withdraw their responses from the survey. At this point he or she clicked to submit their responses to the central database. All participants completed all 4 questionnaires. The experimenter remained in the room whilst respondents completed the battery of questionnaires. At the end of the data collection period, participants were thanked for their help and informed that feedback on the research would be available.

## RESULTS AND DISCUSSION

Table 1 illustrates participants responses to AEI subscales and the STA schizotypy scale broken down by gender.

Table 1
GENDER DIFFERENCES

| Scale | Gender | Mean | S.D. | *P* value of difference |
|---|---|---|---|---|
| Anomalous ability | female | 1.4653 | 2.1287 | $p>.266$ (1 tailed) |
| | male | 1.2195 | 2.0918 | |
| Anomalous belief | female | 6.2178 | 2.8093 | $p>.153$ (1 tailed) |
| | male | 5.1500 | 3.2149 | |
| Anomalous experience | female | 7.1188 | 4.2362 | $p>.136$ (1 tailed) |
| | male | 6.2500 | 4.1556 | |
| Fear of the anomalous | female | 1.8911 | 1.7082 | $p<.007$ (2 tailed) |
| | male | 1.0750 | 1.3085 | |
| Schizotypy | female | 18.6146 | 6.9044 | $p<.00005$ (1 tailed) |
| | male | 12.5122 | 5.9335 | |

The descriptive data demonstrate that there does not seem to be much difference between mean values for anomalous ability but there are small differences with females scoring higher than males for belief, experience and fear of the anomalous. The mean for females on the schizotypy scale is also a lot higher than that for males. Several independent samples t tests were executed to look for sex differences in scores on the variables. In contrast to predictions, it was not found that females scored higher than males in terms of anomalous experience, belief or perceived ability. However, there is a sex difference in terms of fear of the paranormal. Females scored significantly higher than men on this scale ($t$=2.720, d.f, 139, $p$<.007, two tailed). It was also found that the higher mean score for females was significantly greater than the mean score of males on the schizotypy scale ($t$=4.932, d.f, 135, $p$<.00005, one tailed).

The gender role[8] data were put into categories of masculine, feminine and androgynous. Summary data for the participants responses to the subscales of the AEI and STA schizotypy scale are reported below in table 2.

Table 2
GENDER ROLE DIFFERENCES

| Scale | Gender role | Mean | S.D. | *P* value of difference |
|---|---|---|---|---|
| Anomalous ability | masculine | 2.2500 | 3.2762 | $p$> .428 (2 tailed) |
| | feminine | 1.5500 | 1.9050 | |
| Anomalous belief | masculine | 6.4375 | 3.0544 | $p$> .667 (2 tailed) |
| | feminine | 6.0000 | 2.9736 | |
| Anomalous experience | masculine | 7.7500 | 6.2450 | $p$> .731 (2 tailed) |
| | feminine | 7.1000 | 4.9937 | |
| Fear of the anomalous | masculine | .8750 | 1.3601 | $p$< .006 (2 tailed) |
| | feminine | 2.1500 | 1.2680 | |
| Schizotypy | masculine | 15.5882 | 6.6432 | $p$<.031 (1 tailed) |
| | feminine | 20.3333 | 7.7611 | |

The descriptive data reveal that the mean for anomalous ability is higher for masculine than the feminine gender role and that there is not much difference between them for anomalous belief and anomalous experience. For fear of the anomalous and schizotypy those with a feminine gender role score higher than those with a masculine gender role. As with gender, independent $t$ tests were undertaken to assess differences between gender roles. Fear of the anomalous or paranormal was the only variable where there

[8] Gender role category was calculated by means of z scores. A value of less than -1 was classified as masculine, a value of between -.99 and +.99 was classified as androgynous and a value from +1 upward was classified as feminine.

was a significant difference between the masculine and the feminine gender roles. Individuals with more feminine gender roles were more afraid of the paranormal than those with masculine gender roles ($t$=-2.903, df, 34, $p$<.006, two tailed). There was also a slight trend toward significance where those with more feminine gender roles scored higher on the schizotypy scale than those with more masculine gender roles ($p$<.031, one tailed).

It seems from this analysis that there is a differential contribution of biological gender and gender role. Females score higher on the schizotypy scale than males. Females also experience more fear of the anomalous, as do those with a more feminine gender role, irrespective of gender. Because of such a strong gender difference in schizotypy, a regression analysis was undertaken to assess the differential contributions of schizotypy, gender and gender role to fear of the anomalous. Where all 3 variables were entered, only schizotypy and gender role remained in the equation, the beta weights were .208 for schizotypy and .180 for gender role. Where the gender variables alone were entered, the beta weight for gender role was .259. Therefore there is a stronger effect for schizotypy than gender role in the amount of fear of the anomalous reported by respondents. This implies that the difference for between the genders in fear of the anomalous may be explained independently by schizotypy and gender role.

Table 3
CORRELATION MATRIX

| | Age | Exp | Belief | Ability | Fear | Drugs | Sexrole[9] | Schiz | CPES |
|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | | | | | | | | |
| Anom exp | .287** | 1 | | | | | | | |
| Anom belief | .173* | .637*** | 1 | | | | | | |
| Anom ability | .204* | .711*** | .449*** | 1 | | | | | |
| Fear | -.081 | .006 | -.035 | .072 | 1 | | | | |
| Drugs | .134 | .231** | .197* | .091 | -.147 | 1 | | | |
| Sexrole | -.019 | -.018 | .000 | -.120 | .259** | -.021 | 1 | | |
| Schiz | .030 | .503*** | .495*** | .389*** | .249** | .173 | .205* | 1 | |
| CPES | .125 | .653*** | .557*** | .475*** | -.041 | .257** | .022 | .605*** | 1 |

*significant at .05 level; **significant at .01 level; ***significant at .0001 level

[9] The sexrole values used in the correlation were the z score values of the difference between femininity and masculinity scores on the BSRI.

*Correlational analysis*

All variables in the study were tested for inter-correlation (using Pearsons correlation coefficient). This parametric test was considered robust enough to deal with slight deviations from the normal distribution found in the data sets. The analysis was undertaken at the more conservative 2 tailed level despite the fact that many directional predictions were made about the relationships between many of the variables. The resulting correlation matrix can be seen below in table 3.

Positive and significant correlations were found between many of the variables in the correlation matrix. Schizotypy is positively and significantly correlated with anomalous experience, anomalous belief, anomalous ability, fear of the anomalous, sex role and complex partial epileptic like signs. Complex partial epileptic signs were positively and significantly correlated with schizotypy, anomalous experience, anomalous belief, anomalous ability and drugs taken. Age was correlated with anomalous experience, belief and ability. Anomalous experience, belief and ability were also all positively and significantly correlated with one another.

As there were 36 correlations undertaken in one analysis, there may be the problem of multiple analysis. As a control, a Bonferroni correction was applied. The alpha level was worked out to be .05/36, which works out to be a level close to .0001. Correlations that hold up at this very high alpha level are those between anomalous experience and anomalous belief; anomalous ability and anomalous experience; anomalous belief and anomalous ability; anomalous experience and schizotypy; anomalous belief and schizotypy; anomalous ability and schizotypy; anomalous experience and CPES; anomalous belief and CPES; anomalous ability and CPES and schizotypy and CPES.

The STA scale includes various items relating to items on the AEI and belief in paranormal/anomalous phenomena. This would inflate a correlation between the AEI and STA and it is important to assess whether the relationships hold up anyway. Five items were removed which were considered to measure anomalous belief or experience or items that are related to the paranormal and appear on the AEI. These items may be seen in table 4 below. The correlational analysis was then repeated with a more stringent version of score on the STA schizotypy scale. See table 5 for the results of this stringent analysis of schizotypy.

Table 4

ITEMS REMOVED FROM THE STA SCALE IN A STRINGENT CORRELATION ANALYSIS

| |
|---|
| 1. Do you believe in telepathy? |
| 18. Are you sometimes sure that other people can tell what you are thinking? |
| 30. Do you believe that dreams can come true? |
| 33. When coming into a new situation have you ever felt strongly that it was a repeat of something that has happened before? |
| 34. Have you ever felt that you were communicating with another person telepathically? |

Table 5

CORRELATIONS BETWEEN VARIABLES AND A STRINGENT MEASUREMENT OF SCHIZOTYPY

| Age | Exp | Belief | Ability | Fear | Drugs | Sexrole | CPES |
|---|---|---|---|---|---|---|---|
| .016 | .446*** | .429*** | .336*** | .260** | .156 | .202* | .558*** |

There are still moderate relationships between schizotypy and items on the Anomalous experience inventory. This indicates (as with previous research) that the cognition of schizotypes is related to experiences of anomalous phenomena, the perception of having anomalous ability and the holding of paranormal/anomalous beliefs. These correlations also indicate, to a weak extent, that fear of anomalous experiences is related to schizotypy. A weak relationship with gender role is also revealed here which may be associated with the gender difference in schizotypy scores found in this investigation. The strongest relationship is with temporal lobe lability. Those who score high on the schizotypy scale are also likely to score high on the CPES scale. It may be that these two variables tap a similar or complementary cognitive style.

*Path Analysis of the relationship between personality and gender variables and the relationship between anomalous experience, perceived ability and belief (belief is the outcome variable)*

It is impossible to determine the nature of the relationship between the personality variables and the variables of the AEI because we cannot infer causality from the many correlations described in the matrix above. It would also be interesting to see how variables specifically predict (in the statistical sense)[10] one another. By using stepwise multiple regression in a path analysis it is possible to look at the relative contributions each variable makes to a criterion variable and the structure the data forms. Belief was entered into the equation as the first dependent or criterion variable. This decision was made as it has been previously found that belief is predicted by experience and not the other way around (e.g. Lawrence et al 1995). At each stage in the analysis variables used as the dependent variable were completely removed. A representation of how the variables interact as a whole may be seen the diagram below. The different stages in the path analysis can be described in the following equations:

Table 6

1. Belief = .336× (anom exp)+.112× (schiz)+1.861
2. Anom experience = .1034× (anom ability)+.575× (CPES)+.103× (age)+.270
3. Schizotypy = 1.355× (CPES)-4.720× (gender)+.771× (fear of the anomalous)+14.22
4. CPES=.671× (anomalous ability)+.530× (drugs taken)+3.509
5. Anomalous ability = .008384× (age)-.375
6. Fear of the anomalous=.432× (gender role)+1.657
7. Gender =-.123× (gender role)+1.280

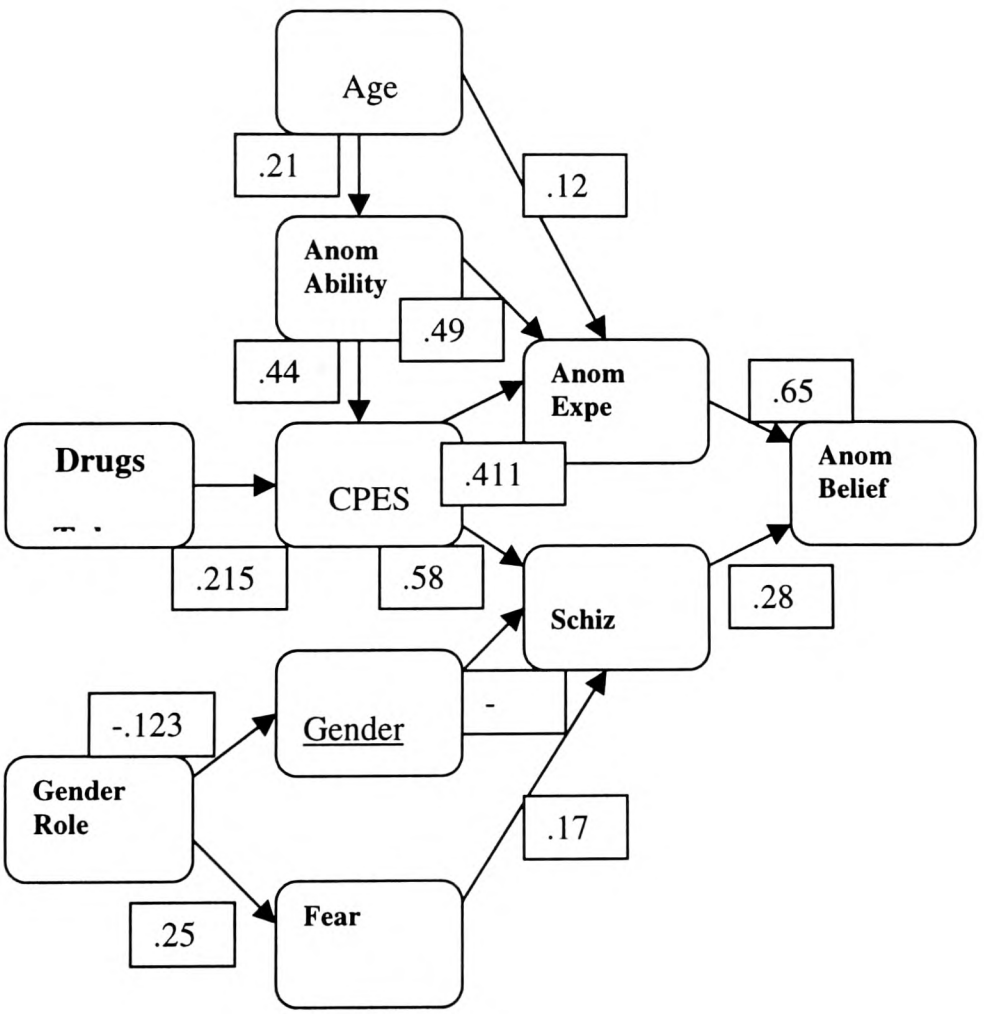
[10] Regression analyses are used to look at relationships between variables, they do not, however, imply that these relationships are causal. It must always be borne in mind that a relationship demonstrated by a regression analysis may be due to other unmeasured variables.

Diagram 1 shows the criteria to be predicted on the right hand side (anomalous belief). The variables appearing directly to the left are those that are independently able to significantly predict the criterion. Beta weightings on the diagram indicate for each relationship, the degree of predictability. The process is iterative in nature, therefore the variables which appear in the second column are those included as the criterion in the second stage and the other variables are regressed to them. In this way a model can evolve that reflects the degree and types of relationships between all of the variables.

The path analysis reveals that anomalous belief is best predicted by anomalous experience with a higher beta weight value than that for schizotypy. It is unexpected that experience and schizotypy are unrelated in terms of how the belief variable is predicted. It is however, in line with the literature that belief seems to be a consequence of experience. Following the initial path analysis, anomalous experience was entered as the dependent variable for the first stage to see what the predictors were. The result at this stage was:

Experience = .935× (ability)+.406× (CPES) +.429× (anomalous belief)+.827

Diagram 1



Thus, anomalous ability contributes more to the variable of experience than does anomalous belief which contributes more than temporal lobe lability. This implies that there might be a stronger prediction of belief from experience as opposed to experience from belief, which is in line with previous findings (Lawrence et al, 1995). As this is only an exploratory analysis no direct conclusions can be made and confirmatory analyses are needed. The model also demonstrates that schizotypy is a predictor of belief in anomalous phenomena but not of anomalous experiences when considered as a predictor of belief.

Schizotypy is however, highly correlated with the both anomalous experiences and beliefs as indexed in the correlation analysis (even where items relating to anomalous experiences are removed from this scale).

Complex partial epileptic like signs (temporal lobe lability) predict scores on both anomalous experiences and schizotypy in this model. The relationship between temporal lobe lability and anomalous experience is strongly expected from the literature (e.g. Persinger and Makarec, 1987). The relationship with schizotypy may reveal similarity in cognition between high scorers on these two scales. Drugs and anomalous ability predict scores on CPES. Drugs have been discussed as one of the variables which may affect temporal lobe lability in normals (see Persinger and Makarec, 1987). Ability in this investigation refers a lot to alterations in consciousness, which would seem to fit with many of the items on the CPES scale. Another explanation for the position of CPES in this model may be due to the association between temporal lobe lability and increased likelihood of imbuing meaning to experiences. Temporal lobe lability predicts both experience and schizotypy which predict anomalous belief. Therefore, it follows that if one scores high on temporal lobe lability, any anomalous experiences which occur to the person and/or 'schizotypal' thoughts (for example more creative, original thought patterns and more - possibly psi related -information coming from lower levels of consciousness) might be given more personal meaning and be more likely to be involved in the formation of beliefs. The model could also suggest that there are two separate pathways to development of belief in anomalous phenomena. These beliefs can arise via anomalous experiences or via having 'schizotypal' patterns of thought. Both of these variables make significant independent contributions to the prediction of belief. According to this model then, the profile of someone who is a believer in anomalous phenomena is likely to have more anomalous experiences and /or 'schizotypal' patterns of thought which are given more meaning by increased temporal lobe lability. The development of belief in anomalous phenomena is likely to be more complex than this model can inform us, for example there are likely to be several types of 'believer' and 'disbeliever'. A more qualitative analysis of peoples' survey responses about their experiences and beliefs are to be assessed as part of a second survey investigation to attempt to further understand the development of such beliefs.

A second wing of the model illustrates the link between gender and schizotypy. Gender role predicts both fear of the anomalous and gender and both gender and fear of the anomalous predict schizotypy. This would reflect the finding that females score higher than males on schizotypy and females and those with a feminine gender role having more fear of the anomalous than those with a masculine gender role. The finding that schizotypy and gender role but not gender predicts fear of the anomalous in a previous section of this paper indicates this relationship may be explained by the strong gender difference on the schizotypy variable. The STA is a general schizotypy measure (although employing mostly positive items). The relationship with fear may, therefore be due to the paranoia items which appear on schizotypy and schizophrenia measurement scales.

Schizotypy is a multidimensional construct and further research with the various subscales is warranted to tease apart the relationship between cognitive style and paranormal belief and subjective paranormal

experience. It is suggested that future research should employ a measurement scale such as the OLIFE (Oxford-Liverpool Inventory of Feelings and Experiences, see Claridge 1997) to assess both subjective and objective experiences of psi. A Ganzfeld study is currently in progress at University College Northampton using the OLIFE alongside the CPES to look for personality correlates of both subjective and objective psi experiences and a global measurement of belief.

Overall then, there do seem to be personality types which are likely to experience more anomalous phenomena and hold more beliefs in such phenomena. It must be re-emphasised that this model is only exploratory in nature, therefore a replication survey using the same variables would be of interest to see if these relationships hold up. A survey among members of the general population has been undertaken at University College Northampton in order to assess the relationships between the variables among a different sample group. Preliminary analyses have revealed strong similarities with relationships described in the current paper.

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# THE PROBLEM OF FINDING AN OPTIMAL MEASURE OF EFFECT SIZE FOR PSI EXPERIMENTS

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## ABSTRACT

The measurement of effect size (ES) has a long history in parapsychology, though the earlier attempts did not use this special statistical term. Already in 1935, R. H. Thouless presented an index of "psi efficiency" (later on called ESP quotient) that measures the relative number of psi-effected (or "true") hits. He used a straightforward statistical derivation separating the hits into true hits and chance hits. Over the years, his index was discussed and redefined by several authors, among them the present author (1971), who termed it psi-coefficient ($\psi$) and also derived an alternative index ($\psi'$) using an extended model, in which the single trials are divided into several sub-trials. Other parapsychologists used or discussed the ES measure $z/\sqrt{n}$ , which later became commonly used (e.g., Schmidt 1971). At that time, however, most parapsychologists showed little interest in this topic.

No new development arose until meta-analyses were introduced. Then the interest clearly increased, but it was directed to widely applicable ES measures such as $z/\sqrt{n}$. Thus it was overlooked that in ESP experiments a mixture of a perceptual and a guessing component is given, which outside parapsychology can only be found in a few multiple-choice designs. The necessary elimination of the guessing component can only be obtained by a special ES measure adjusted to this situation. Of course the common ES measures are not such adjusted measures. And also Rosenthal's and Rubin's more recent index $\pi$ (1989) does not have this quality though, strangely enough, it was presented as an ES measure for the multiple-choice case.

A special feature of the true hit model is the conclusion that, given positive and constant ES, the significance of ESP experiments must increase not only with $n$, but also with decreasing hit probability $p$ (or with increasing number of target alternatives $k = 1/p$). For instance, the classical ESP experiments with 5 alternatives should lead to $z$-scores twice as high as experiments with 2 alternatives. Unfortunately, Rosenthal's and Rubin's derivation suggests the contrary: Given the very low ES, typical for parapsychology, it leads to a recommended "$k$-best" of nearly 2! Since their derivation is not based on a realistic psychometric model, but more on an ad hoc scale transformation, its application to ESP and other multiple-choice experiments is quite problematic. Besides the index $\psi$, at best the author's alternative index $\psi'$ is recommendable (in fact also for PK experiments), since it represents a compromise between the extremes.

## INTRODUCTION

29 years ago I published an article, titled "The measurement of psi" in German, which also was published in English in 1973 (Timm,1971,1973). There I described and compared at least 4 different measures of effect size (ES) in psi experiments and gave concrete recommendations for their application. At that time, however, the parapsychologists showed so little interest in this topic that only a few decided to use such a measure. Most of them calculated only the usual CRs for their results and believed that this way they also had measured their participants' "psi efficiency" or the strength of the experimental effect. But a significance measure increases with the sample size $N$ and so it cannot measure the ES.

Strangely enough, the concept of effect size gained importance in scientific practice only in the eighties when meta-analyses were introduced. Thus, at least today, each parapsychologist realizes that effect measures and significance measures are both necessary to describe the experimental results. Primarily we are interested in the ES, but we may only interpret it if it is statistically significant. For instance, a coefficient of correlation (being an ideal ES measure) can be relatively high and important, but insignificant

and not interpretable due to a small *N*. Conversely, a correlation may remain small and irrelevant while it is significant and interpretable due to a large *N*.

Yet there remains the question which measure of ES is the most appropriate for a certain purpose. And on that point, there seems to be a new confusion, especially with the standard psi experiments, though they only lead to simple numbers of hits. As evidence for this, note the astonishing willingness with which many parapsychologists adopted a widespread ES measure in the eighties, only to abandon it as willingly in the nineties in exchange for Rosenthal's new Pi-Index. If they had quoted the earlier discussions on this subject, which started with Thouless in 1935 and finished with my contribution in 1973, perhaps they would have decided that, at least with ESP experiments, neither of the two measures is recommendable. In the following I will try to connect the recent discussions with the former and so to contribute to a clarification of the problems (see also Timm,1993).

## " *Z* PER TRIAL " AS ES MEASURE

First of all, I want to propose 4 guiding principles crucial for my further comments:

A) An ES measure should be as clear as possible, and therefore a null-effect should have the value 0 while any maximum or minimum effects may have the values +1 and -1.

B) The scores of psi experiments arise in different ways, so that different ES measures are worth discussing and usable. In particular, a distinction must be made between ESP and PK experiments and between psi-hitting and psi-missing.

C) Moreover it should be considered that here, in contrast to most other biosocial experiments, we have individual effects of the participants, which only secondarily are summed up to collective effects, so that the requirements for measurement on psychological test scales must be met in addition.

D) Most important (and ignored in the last years) is the fact that in all ESP and many PK experiments the scores represent a sum of *chance hits* and psi-effected "*true hits*" and only the true hits are relevant for the measurement of ES. Since outside parapsychology this situation is fulfilled in only a few one-sample multiple-choice-experiments, an uncritical transfer of ES measures from other contexts to psi experiments is generally questionable.

The last statement is directly applicable to the simplest and most common ES measure, that is the index $z/\sqrt{n}$, $n$ being the number of trials and $z$ the usual $z$-test for the number of hits (CR). It is a simple function of the hit rate $h$ and the hit probability $p$, and in the following I call it $Z_o$ :

$$(1) \quad Zo = z/\sqrt{n} = (h - p)/\sqrt{pq}$$

This index follows from the fact that, given constant ES, the z-score generally increases with $\sqrt{n}$, and so in parapsychology the index can be defined as "*z per trial*" (with $n$=1). If we multiply it by $\sqrt{n}$, we easily get a prediction of the $z$-score for any n. For this reason Schmidt discussed it in 1970, and I described it in my 1971 article as a useful measure of "relative significance", by which one can compare the statistical efficiency of different experiments. I avoided, however, accepting this index as a general ES measure for psi experiments, and I also defend this point of view today, at least for ESP experiments.

## THE " TRUE HIT RATE " AS ES MEASURE

The reason for my reservation is included in the above principle D, which assumes that in ESP experiments each hit can be either a true hit or a chance hit and that the observed number of hits $X$ is the sum of the two kinds of hits, $Xt$ and $Xc$:

$$(2) \quad X = X_t + X_c$$

A natural conclusion of this assumption is the introduction of the *relative number of true hits* (or the *true hit rate*) as ES measure. To this end, first *Xc* is estimated as the hit expectation of those trials that remain, when *Xt* has been subtracted from *n*:

( 3) $\text{est.}\,Xc = p\,(n - Xt)$

From this a straightforward estimate of Xt then follows:

( 4) $\text{est.}\,Xt = (X - np)/q$

Finally one divides *Xt* by *n* and gets the ES measure for psi-hitting, denoted by the Greek letter $\psi$:

( 5) $\psi_{[+]} = (h - p)/q$

This index is a psychometrically evident measure of a subject's multiple-choice-performance or that of a collective, and thus an ideal ES measure for ESP experiments. I have termed it *psi-coefficient* in 1971. Thouless, however, had already introduced it as measure of "psi efficiency"( later on called "ESP quotient") in 1935. The rule of derivation is even older, since it was used still earlier in calculating the so-called correction for guessing of multiple-choice scores in psychological tests. ( It is described in textbooks on psychological test construction.) By the way, the underlying parameter can also be interpreted as *"true hit probability"*, which must be equal for all target alternatives (see also Turner & Osis,1970). For psi-missing

Table 1

DIFFERENT EFFECT SIZE MEASURES AS A FUNCTION OF THE HIT RATE (*H*) AND THE HIT PROBABILITY (*P*) (MULTIPLIED BY 100)

| | *p* = 1 / 2 | | | | *p* = 1 / 5 | | | | *p* = 1 / 100 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *h* | $\psi$ | $\psi'$ | $\pi'$ | *Zo* | $\psi$ | $\psi'$ | $\pi'$ | *Zo* | $\psi$ | $\psi'$ | $\pi'$ | *Zo* |
| 00 | –100 | -100 | -100 | -100 | -100 | -100 | -100 | -50 | -100 | -100 | -100 | -10 |
| .05 | -90 | -90 | -90 | -90 | -75 | -45 | -65 | -37 | 04 | 27 | 68 | 40 |
| .10 | -80 | -80 | -80 | -80 | -50 | -26 | -38 | -25 | 09 | 41 | 83 | 90 |
| .15 | -70 | -70 | -70 | -70 | -25 | -12 | -17 | -12 | 14 | 50 | 89 | 141 |
| .20 | -60 | -60 | -60 | -60 | 00 | 00 | 00 | 00 | 19 | 57 | 92 | 191 |
| .30 | -40 | -40 | -40 | -40 | 12 | 19 | 26 | 25 | 29 | 67 | 95 | 292 |
| .40 | -20 | -20 | -20 | -20 | 25 | 35 | 45 | 50 | 39 | 74 | 97 | 392 |
| .50 | 00 | 00 | 00 | 00 | 38 | 48 | 60 | 75 | 50 | 80 | 98 | 492 |
| .60 | 20 | 20 | 20 | 20 | 50 | 60 | 71 | 100 | 60 | 85 | 99 | 593 |
| .70 | 40 | 40 | 40 | 40 | 62 | 71 | 81 | 125 | 70 | 90 | 99 | 694 |
| .80 | 60 | 60 | 60 | 60 | 75 | 82 | 88 | 150 | 80 | 93 | 99 | 794 |
| .90 | 80 | 80 | 80 | 80 | 88 | 91 | 95 | 175 | 90 | 97 | 100 | 894 |
| 1.00 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 200 | 100 | 100 | 100 | 995 |

a separate derivation must be performed, dealing with "true misses" and "chance misses". It results in a complementary formula with a negative sign:

(6) $\psi_{[-]} = (h - p) / p$A simultaneous detection of true hits and true misses is impossible. If the positive score deviations are converted into $\psi_{[+]}$ and the negative score deviations into $\psi_{[-]}$, the resulting coefficients range between +1 and -1 for any hit probability $p$. Like all the ES indices we will discuss, the index $\psi$ equals $Zo$ for $p=½$ . In table 1 the various values of $\psi$, $Zo$, and other indices are listed, corresponding to different values of h and p. ( More details can be found in the publications mentioned above.)

When one describes $\psi$ as a function of $Zo$, one sees clearly that, given decreasing $p$, $\psi$ decreases for psi-hitting and increases for psi-missing, compared to $Zo$. If $z$ is used instead of $Zo$, one sees in addition that, due to the large $n$, the relative number of psi-effected hits is extremely low in most significant experiments:

(7) $\psi_{[+]} = Zo\sqrt{p/q} = z\sqrt{p/nq}$

The index $\psi$ usually ranges between .001 and .01. Therefore 98 to 99.9% of the hits must be chance hits, given $p=½$! If one realistically assumes that true hits are only found in perhaps 5% of the Ss, the index is increased to .02 resp..2 for them, but still 67 to 96% of their hits must be chance hits. Of course this low ES can also be inferred from $Zo$. But only the psi coefficient clearly identifies the extremely low values as true hit rates.

However, the most important conclusion from this index arises, when one describes $Zo$ as a function of $\psi$:

(8) $Zo = \psi_{(+)}\sqrt{q/p}$

Surprisingly, given a positive and constant $\psi$, $Zo$ increases with *decreasing* $p$. Consequently, ESP experiments with psi-hitting should turn out more significant having a higher number ($k$) of target alternatives . The classical ESP experiments with 5 alternatives amazingly should lead to $z$-scores twice as high as experiments with 2 alternatives. This is a remarkable difference, which otherwise would only be obtained by quadrupling the sample size!

Theoretically this rule is reversed for psi-missing. However, since that may often be mixed with psi-hitting, also in this case a low value of $p$ can be favorable. For instance suppose any true hit rate and a true miss rate of *equal* size are given, and $p$ is below ½ . Then it can be derived that, with decreasing p, the effect of hitting increasingly overcompensates the effect of missing so that $Zo$ also increases! This special increase of $Zo$ can be seen on the following graph, together with its normal increase (see fig.1) .

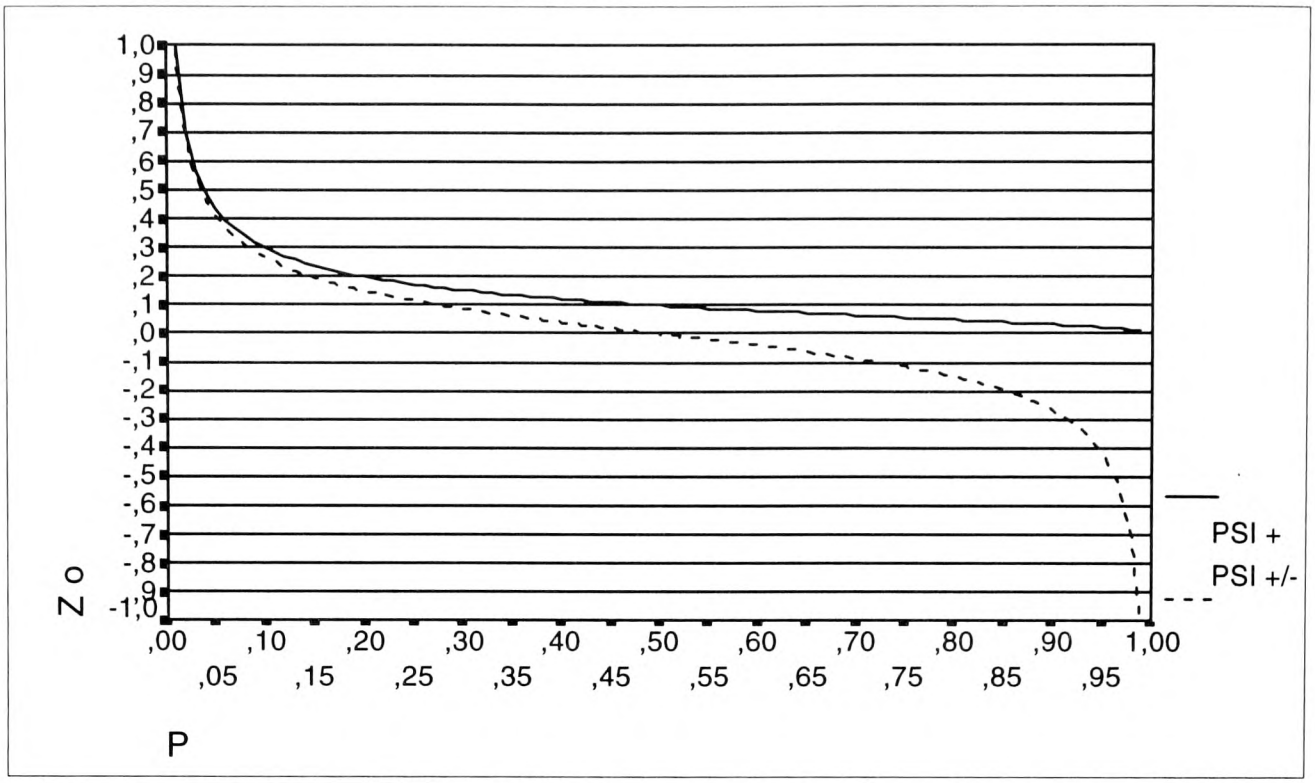
Of course, these predictions may not hold, as the Ss could be so occupied by the higher number of alternatives, that their psi performance is reduced. Thus the decrease of the factor $\psi_{[+]}$ in the formula would more or less compensate the increase of the other factor. It is, however, hardly conceivable and not empirically supported that such a decrease occurs already with 3, 4 or 5 alternatives. If one expects no decrease for 3 alternatives, an empirical test of the expected increase of Zo is possible. For it can easily be calculated that, with psi-hitting, $Zo$ must increase by the factor $\sqrt{2}$ when $k$ is altered from 2 to 3:

(9) $Zo_1 / Zo_2 = \sqrt{(k_1 - 1)/(k_2 - 1)}$

Moreover, impeding ESP by an increased number of alternatives is impossible, if we move on to a post-hoc choice (or matching) of the targets, such as found in free response experiments and in the examination of quasi-diagnostic methods. So we may let the choice of the target picture be made from among 20 alternatives - instead of 4 - in the evaluation of a ganzfeld experiment, or ask an astrologer, to

Figure 1

*Zo* AS A FUNCTION OF *P* FOR $\psi_{[+]} = .1$ AND SIMULTANEOUS $\psi_{[+/-]} = .1$




find the horoscope of a suicide among 20. Here the 5% -level of significance could theoretically be reached with a single trial! Of course I know that the realization of this recommendation is connected with some practical problems. But the statistical advantage is so tremendous that it is worth removing these difficulties by appropriate methods of response rating and target selection.

Apart from these practical considerations, a possible dependence of the effect size on the hit probability cannot argue against the index $\psi$ itself, which is also supposed to measure any (positive or negative) influences on the subject's psi performance. Also its practicability cannot be diminished. For instance, the prediction of significance for any n is as good or bad as through the index *Zo*.

In a stricter discussion, it should be stressed that statistically not the high number of alternatives, but the low probability *p* is decisive. A low *p* can be attained also with 2 alternatives of unequal probability. I want to illustrate this by means of an example from free response technique, which at the same time brings out the difference between the indices $\psi$ and *Zo*: Suppose a clairvoyant tries to describe a target person unknown to him, and he says "I see his right hand with 5 fingers". Then we can describe this statement as a trial with p near 1, because the relative frequency of this attribute is extremely high. If it is a hit and the fictional experiment contains only that trial, the index *Zo* lies near zero. Suppose, however, he says "his right hand has only 3 fingers", and it is also a hit. Then *Zo* must become extremely high. For *p* lies near zero, because we are dealing with an extremely rare attribute. Consequently, if we accept the index *Zo* as ES measure, we must say that in the first case the psi effect is extremely low while in the second case it is extremely high. If we, however, use the index $\psi$, we get the *same* value 1 in both cases.

It is obvious that the second measurement is correct, since ESP may have equal difficulty in perceiving a hand with 5 fingers as with 3 fingers. The fact that it is easier to *guess* a hand with 5 fingers is relevant only under the null hypothesis. This fact increases the power of the significance test, but not the size of the psi effect. Obviously, here we deal with one of the rare cases in which the power of the significance test depends on an additional parameter, that is $p$. So the index *Zo* becomes an ambiguous measure that, with varying $p$, registers the effect size as well as the altered efficiency of the significance test. Therefore it is a superfluous and even misleading ES measure, if the true hit model is correct. However, as a measure of relative significance it is not only useful, but the only one that clearly shows a possible dependence of significance on $p$. Thus, in multiple-choice experiments, both the measures can have practical use.

## OBJECTIONS AND MODIFICATIONS CONCERNING THE TRUE HIT MODEL

Of course, there are also arguments against this model. An objector can say that the ES definition should apply to the original empirical measurement and not to a secondary and interpretational division of the scores into true hits and chance hits. To that, however, one can reply that here the chance hits have the function of a systematic error of measurement, the elimination of which is statistically reasonable.

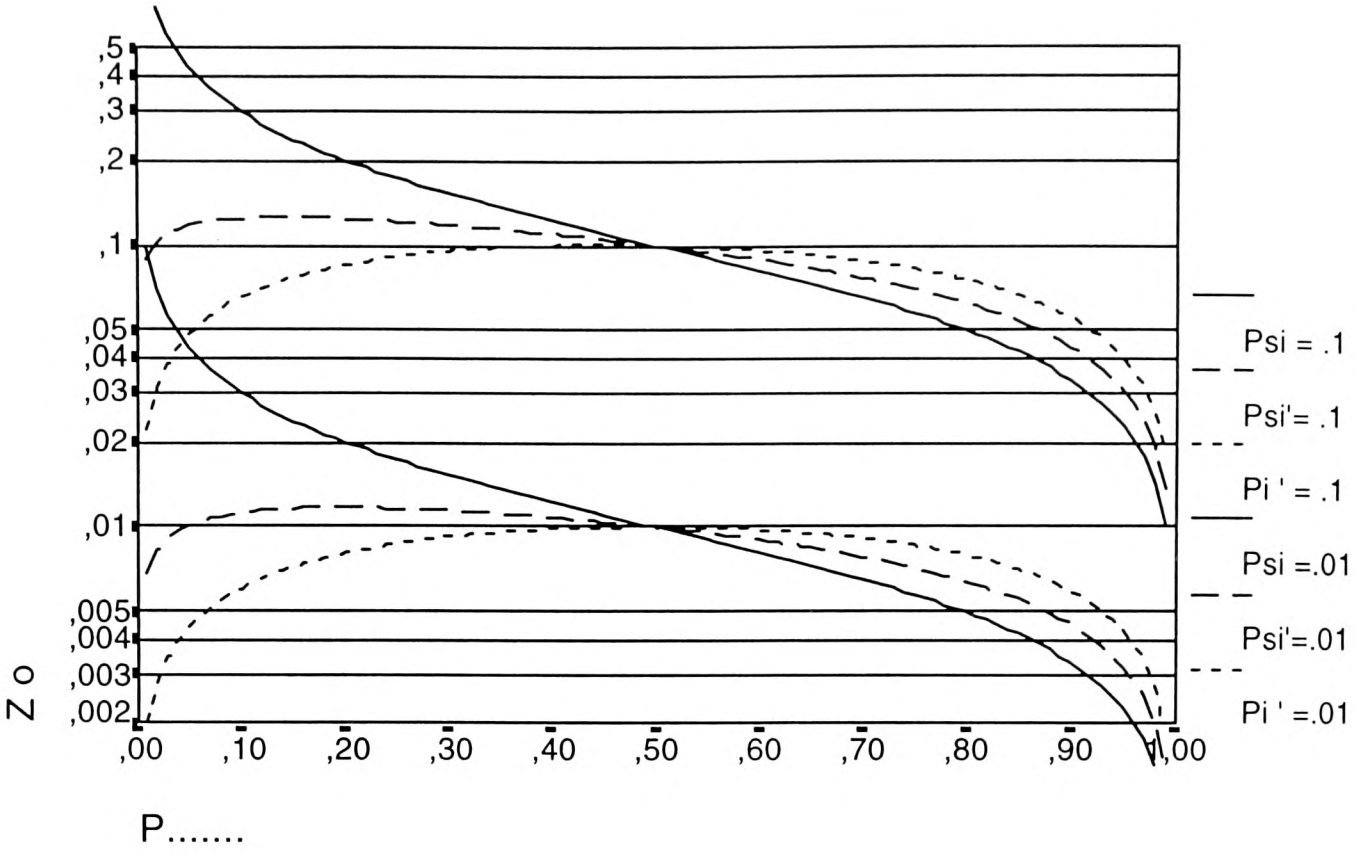
Another objection is that the model uses a holistic concept of perception, in which a target is only perceptible as a whole. For it could be possible that the ESP functions in several steps and so, the higher the number of alternatives the more steps are necessary. Though this model, given simple ESP targets, appears rather improbable to me, I have derived an *alternative psi coefficient* for it in my 1971 article. In this derivation a trial is divided into m sub-trials representing binary decisions with $p' = ½$ . The number m equals the bits contained in one target according to information theory. For instance, given 4 target alternatives combining the dimensions "big versus small" and "round versus angular" ( with m = ld4 = 2), one could in a first step decide, if the target is big or small, and in a second step, if it is round or angular. Obviously the whole trial can only then be a hit, if *all* the sub-trials are hits. Thus, in this model it is relatively difficult to obtain a hit, and a given number of hits usually leads to a higher ES measure than in the first model. The resulting index $\psi'$ is defined as the *relative number of true sub-hits :*

$$(10) \quad \psi' = 2\,h^{1/m} - 1 \qquad [\; m = -\mathrm{ld}\,p = \mathrm{ld}\,k \;]$$

The formula for $\psi'$ is somewhat difficult, but it has the statistically important advantage of being the same for psi-hitting and psi-missing. Even more important is the fact that the dependence on $p$ is clearly reduced and, for very small values of $p$ and $\psi'$, is even reversed. The difference between $\psi$ and $\psi'$ can immediately be seen, if one draws a multiple graph of *Zo* as a function of $p$, given the same fixed values of $\psi$ and $\psi'$ (see fig.2).

This model implies that the *difficulty* of a trial is increased with decreasing $p$, while in the original true hit model the difficulty is constant and any influence of $p$ is interpreted as a change in psi performance. Thus in the graph, the curves of the two indices represent an upper and a lower limit for the psychometric models possible with ESP experiments. Any ES indices lying outside this "window" , for instance *Zo*, can hardly be justified. However, apart from these considerations, the index $\psi'$ may also be interpreted as a compromise between *Zo* and $\psi$ .

Figure 2
ZO AS A FUNCTION OF P FOR 2 FIXED VALUES OF 3 DIFFERENT ES MEASURES




## ROSENTHAL'S "PROPORTION INDEX" AS ES MEASURE

Thus I come to Rosenthal's and Rubin's *"proportion index"* $\pi$ , which has been derived specially for one-sample multiple-choice-experiments and so has the same claim as the index $\psi$ . Since $\pi$ only ranges between 0 and 1 and for a null-effect takes on the value 0.5, I transform it linearly to $\pi'$, which ranges between -1 and +1 like the other indices. I also describe the authors' derivation with regard to $\pi'$.

While the indices $\psi$ and $\psi'$ are based on specific psychometric models, Rosenthal and Rubin (1989, 1992/93) more perform an ad hoc scale transformation of the index *Zo*. This index, applied to different values of p, approaches corresponding normal distributions only for large n, since the numbers of hits have a binomial distribution. One can, however, largely unify and normalize the distributions by incorporating a so-called logit-transformation into the formula of *Zo*. Now the two authors proceed in such a way, as if they would perform this calculation with the correct value of *p* and subsequently reverse it with the *arbitrary constant* $p = ½$ . By this strategy their index $\pi'$ is attained, which - unlike *Zo* - ranges between -1 and +1 for any *p*-values, and so offers better comparability:

(11) $\pi' = (h - p) / [h(q - p) + p]$

(12) $\pi = [h(k - 1) / [1 + h(k - 2)]$

But the indices $\psi$ and $\psi'$ have the same quality as $\pi'$ and, in addition, are based on explicit models, whereas $\pi'$ represents merely an adjusted *Zo*. From this point of view, it is as superfluous for psi experiments as the index *Zo*, though in some ways better than *Zo*. By the way, the similarity to *Zo* can only be seen, if one makes use of my modification $\pi'$. For the original $\pi$ is always higher than *Zo*, and, perhaps for this reason, it was so eagerly adopted by some researchers.

It is, however, more instructive to draw the curve belonging to $\pi'$ in the above graph: Given the very low effect sizes, typical for parapsychology, and usual values of $p$ , the curve is nearly horizontal and lies clearly outside the "window" defined above. This means that *Zo* scarcely varies with p, given a constant $\pi'$. Nevertheless the curve shows a little pronounced maximum, which lies so near to $p = ½$ , that according to Rosenthal, 2 target alternatives are recommendable for nearly all psi experiments. Only for unrealistically high values of $\pi$ will his so-called "*k*-best formula" result in a higher number $k$ of alternatives:

(13) $"p_{best}" = (1 - \pi') / 2$ || $"k_{best}" = 2 / (1 - \pi') = 1 / (1 - \pi)$

Of course this formula stands in sharp contrast to the recommendations from the index $\psi$, as the graph shows. For this reason, its acceptance by many parapsychologists is very regrettable, though it may provide a new example of the well-known Rosenthal effect! - By the way, Shaffer (1991) has published a reply to Rosenthal and Rubin, in which the arbitrariness of their access is criticized and the index $\psi$ is discussed as a sound alternative - without any reference to parapsychology.

## PROBLEMS WITH PK EXPERIMENTS

Now I want to treat the PK experiments, for which the prerequisites of an ES measurement are far more ambiguous than for ESP experiments. Here, even a parameter of the physical target generator could directly be influenced, so that the hit probability p is altered for a while. Of course, true hits and chance hits could then no longer be distinguished: Instead of 1 true hit and 1 chance hit one could just as well assume 2 "half-true" and 2 "half-chance" hits. However, the sum of these figures would remain the same, so that the overall hit deviation could perhaps still be measured in "true hit units". But in some PK experiments the index $\psi$, derived for ESP, may distort the measurement more than $\psi'$. When complex movements or processes are to be influenced, the "step by step"-index $\psi'$ would be generally preferable. On the other hand, the distinction between the different indices here is more of an academic nature and irrelevant in practice. For in PK experiments, today one mostly uses a $p$ of ½ , and for this hit probability all the discussed indices are equal, as you know. In contrast to ESP experiments, this practice may be justified, since it seems likely that many PK effects become more difficult and weaker with $p \neq ½$ . If, however, one really wants a universal ES measure, applying to ESP, PK, and any values of $p$, then I would propose the index $\psi'$, which perhaps is the golden mean between the extremes.

## ES MEASURES AS INDIVIDUAL SCORES OF PSI PERFORMANCE

In the above principle C, I already stressed the fact that in parapsychology an effect size can be attributed also to individual Ss. Consequently, instead of the common hit rate, an ES measure should be used, if the

scores of the Ss are further processed, for instance in an ANOVA or in a correlational analysis. However, with constant p this demand is less important, as in this case all ES indices are at least monotone functions of the hit rate $h$. The index $\psi$, recommended for ESP, is even a simple linear function of $h$, if limited to psi hitting. On the other hand, if we want to allow also for psi missing, the now altered formula leads to ambiguities, since not every negative hit deviation need result from psi missing. Therefore the compromise index $\psi'$ here has certain advantages, also for ESP experiments.

However, the actual use of the ES measures, treated so far, still has a general handicap, which is the same for all indices: In their calculation it is assumed that the psi effect is constant for all trials and Ss. As a result, the hit rate ( h) appears as the only empirical quantity in all formulas. We know however, that psi effects show an unusual inter- and intrapersonal variability. Positive and negative deviations may even cancel each other out, so that the usual evaluation leads to a chance result. For this reason, I always preferred refined methods of evaluation weighting the results of single experimental sections or Ss according to their size and direction. The simplest of these methods adds up the squared $z$-scores of the single sections, and was introduced quite early by the Rhinean school under the misleading name "run score variance". Consequently, in a similar way also ES measures can be defined, which I first did in my 1971 article. According to my definition, the square of such an *aggregated ES index* equals the mean square of the indices calculated for the single sections(s). In addition, however, one must subtract a correction for bias, which equals the standard error variance of the respective index. Also in this case, the calculation for the index $\psi'$ is easier than for $\psi$, since positive and negative hit deviations need not be treated differently :

$$(14) \quad \psi^{2}_{aggr} = (\Sigma \psi^{2}) / s - (s_{+} p^{2} + s_{-} q^{2}) / (snpq)$$

$$(15) \quad \psi'^{2}_{aggr} = (\Sigma \psi'^{2}) / s - q / (n m^{2} p)$$

[ $s+,s-$ =No. of sections with positive resp. negative deviations, $s$ =No.of sections, $n$ =trials per section ]

When single runs of a S are chosen as sections, the aggregated index is an optimal measure of his *absolute* psi performance. If a significant score fluctuation exists in his data, this index must be higher than the simple ES index. However, since it has no sign, it cannot measure the direction of the psi effect. Thus, to distinguish between "psi hitters" and "psi missers", one has to include both measures as variables in a correlational design (Timm,1982) .

### OPTIMAL WEIGHTS FOR COMBINING EXPERIMENTAL RESULTS WITH DIFFERENT HIT PROBABILITY

Finally I want to return to the true hit model and to the advantage of using low hit probabilities in ESP experiments. Suppose some experiments with different values of $p$ have already been performed. Then the true hit model still enables us to derive statistically optimal weights for the aggregation of these results. In the case of psi-hitting the weights for independent hit scores are simply $1/p$. Such weights are especially useful, if we want to combine the results of *single* trials in free response experiments. For instance, in the above example of 5 versus 3 fingers, the optimal weight would also be the inverse hit probability of each trial. This means that the statement about 5 fingers would get a weight near 1, while the statement about 3 fingers would get an extremely high weight of perhaps 1000. Thus the less specific statements cannot influence the overall result greatly. The complete derivation for independent and correlated trials was performed by me in 1970 (Timm,1970) .

It is interesting that only the true hit model leads to a mathematical solution for these weights. I openly confess that I am fascinated by this model, though in practice I would not *always* use the affiliated index.

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# A COMPARISON OF GANZFELD AND HYPNAGOGIC STATE IN TERMS OF ELECTROPHYSIOLOGICAL MEASURES AND SUBJECTIVE EXPERIENCE

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## ABSTRACT

The ganzfeld setting has often been used to induce experimentally the hypnagogic state, similar to that occurring at sleep onset. However, the underlying assumption that the ganzfeld really induces a true hypnagogic state, has not been adequately investigated to date.

The aim of this exploratory study was to investigate electrophysiological correlates and subjective dimensions of experience of: (i) the hypnagogic state, at sleep onset, and (ii) the ganzfeld state, induced by homogenisation of perceptual field. 12 female paid volunteers ranging in age from 22 to 39 participated in the study. 19 channels EEG, 2 channels horizontal EOG and 1 channel EMG were recorded in 5 experimental conditions: (1) waking state at daytime, (2) ganzfeld, (3) waking state before sleep onset, (4) sleep stage 1, (5) sleep stage 2. Following a pre-defined schedule, the participants were given an acoustic signal and asked for a verbal report of their momentary subjective experiences and ratings of the reported experiences on several ordinal self-rating scales. The reports were recorded and transcribed later. A total of 241 reports with simultaneous EEG-recordings was collected.

Data pre-processing and analysis was divided into several phases. The first phase aimed at the characterisation of the induced states in terms of spectral measures of the electrical brain activity (EEG). FFT analysis of 5 consecutive 2 second epochs of EEG activity immediately preceding the prompt prove that the average EEG spectrum in the ganzfeld is more similar to that of the relaxed waking state than to that of sleep onset. Thus the assumption of a hypnagogic basis of ganzfeld imagery is unsupported. The ganzfeld condition, compared to the relaxed waking state, shows a significant shift of the $\alpha$–peak to higher frequencies, thus indicating higher activation. However, EEG indices of vigilance do not show any difference between the ganzfeld and waking states. Four factors, representing 35% of the subjective experiences were obtained by a principal component analysis. Factor I could be interpreted as the subjective dimension of vigilance. There was no difference between the ganzfeld and waking states in this factor; this result confirms the findings of the spectral analysis of EEG. Consistent and global correlations between $\delta$, $\theta$, and $\alpha$ frequency bands on one hand, and the vigilance factor I on the other hand, were found in all time segments.

It is concluded that, contrary to the common belief, the ganzfeld does not necessarily induce a true hypnagogic state, and will surely not do so in most ganzfeld settings. Thus ganzfeld imagery, although subjectively very similar to that at sleep onset, should not be labelled as 'hypnagogic'. Perhaps a broader category of 'hypnagoid experience' should be considered, covering true hypnagogic imagery as well as subjectively similar imagery produced in other states.

## 1 INTRODUCTION

The ganzfeld phenomenon has an ambiguous position in the history of experimental psychology, ranging from studies into human perception to explorations of altered states of consciousness.

The origins of ganzfeld experimentation go back to research into the psychology of perception in the 30s—50s, bearing on the basic notion of figure/background duality, introduced by Gestalt psychology (Metzger 1930; Koffka 1935). The term *ganzfeld* has been used since then for the artificial perceptual situation consisting of an unstructured, homogeneous visual field. Effects of minor inhomogoneities, colour adaptation etc. were studied (Hochberg, Triebel & Seaman 1951; Cohen 1957, 1958).

A similar experimental setup, extended by acoustic masking (white noise) was later used by Witkin and Lewis (1963), to induce state of drowsiness, and to facilitate production of dream-like imagery. The use of the ganzfeld for this purpose is encouraged by the fact that most participants report spontaneous changes to

the (physically) homogeneous field, which becomes progressively more and more structured. The complexity of these structures range from isolated phosphenes and geometrical patterns up to well-developed, vivid imagery. In its subjective quality, ganzfeld imagery may well remind one of imagery observed in so-called hypnagogic states.

It was in the latter vein that ganzfeld found its place in parapsychological experimentation. It was hypothesised that reducing the sensory noise from outer world is an effective technique to achieve an 'internal attentional state' (Honorton, 1977; Parker 1975), a 'psi-conducive' state facilitating the receptiveness to psi interaction. This reflects the observation that psi communication and functioning is frequently associated with internal attention states artificially induced through hypnosis, meditation, dreaming and similar states. Thus, this hypothetical construction strengthened the alleged link between ganzfeld and dreaming or dream-like imagery.

The notion of 'hypnagogic state' was introduced by Maury (1848) who was the first to describe the characteristic features of the vivid and realistic imagery associated with sleep onset. Imagery during sleep onset can be of any sense modality, and frequently reaches nearly hallucinatory character (see Mavromatis, 1987 for an extensive presentation of phenomenology of hypnagogic state; also Sherwood, 1998, specially for relationships to parapsychology; and Kuhlo & Lehmann 1964 for neurophysiological correlates).

As for an objective assessment of physiological correlates of this state, it should be noticed that the exact beginning of sleep onset is difficult to determine because the transition from waking to sleep is a gradual process, the associated physiological changes are not always synchronised and are inter-individually highly variable.

Tart (1969) and Mavromatis (1987) speculated that it may be possible to enter the hypnagogic state not only at times immediately before nocturnal sleep, but also during the day. Like sleep onset, the ganzfeld is also characterised by frequent appearances of dream-like hallucinatory experiences (mostly visual but also other sensory modalities). Because of this very similar subjective experience, the ganzfeld is often described and used as an experimental realisation of the true hypnagogic state (e.g. Witkin & Lewis, 1963; Bertini et al., 1969).

It is not clear to what extent the ganzfeld is identical with the natural hypnagogic state occurring at pre-sleep-time (Braud et al., 1975; Schacter, 1976a); consequently, Schacter suggested the term 'hypnagogiclike', as it is difficult to say whether the ganzfeld imagery consists of a genuine hypnagogic experience or free-associative material.

Even if ganzfeld-induced imagery may well subjectively seem similar to hypnagogic imagery, more substantial empirical evidence would be required for conceiving of the ganzfeld state as an 'artificial hypnagogium'. Until now, no physiological data is available which could support this view.

It is worth noticing that the task of verbalising one's mentation continuously (as is usual in ganzfeld experimentation in parapsychology) creates an additional activation condition preventing to some extent the participant from reaching the true hypnagogium. On the other hand, it is hardly conceivable that a coherent stream of verbal report could continue even when the subject achieved sleep stage 1.

Furthermore, sleep onset, especially sleep stage 1, is a transitional state which cannot be maintained over longer time periods and will soon lead to deeper sleep stages. The ganzfeld condition, on the other hand, can apparently be maintained over longer time periods. Consequently, a thorough analysis and comparison of the ganzfeld condition with sleep onset is needed.

The aim of this exploratory study was

- to compare the electrophysiological signatures (EEG) of the hypnagogic and the ganzfeld states;

- to compare the subjective experience in hypnagogium and ganzfeld state;
- to explore correlations between objective electrophysiological measures and dimensions of subjective experience.

The first results from this study were presented at the 10th World Congress of Psychophysiology in Sydney, February 2000 (Wackermann et al. 2000); the present paper also relates our findings to the historical context and conceptual framework of consciousness research.

## 2 METHODS

12 female paid volunteers ranging in age from 22 to 39 participated in the study. The subjects were recruited by a newspaper advertisement and selected using the following criteria: All had to have good health, no medication, no sleep disorders, and also a well pronounced α–rhythm; the latter to be sure that beginning of sleep stages 1 and 2 would be easily visually detected from the online electrophysiological recordings. Subjects were asked to avoid abundant consumption of substances like alcohol, caffeine, or nicotine during the study, and to avoid alcohol consumption before the experimental sessions. However, they were not discouraged from following their usual daily habits.

A 40-channel BrainScope 220 (M&I Ltd.) amplifier and A/D conversion system was used for electrophysiological data acquisition. 19 channels EEG were recorded against the common reference electrode placed between $F_z$ and $C_z$, using Grass gold cup electrodes placed according to the standard 10/20 system (Jasper et al. 1958). 2 bipolar EOG channels (left and right eye, horizontal) were recorded for detection of eye movements and blink artefacts. EMG was recorded from a pair of electrodes placed on the chin, to assess the degree of muscular tension. The grounding electrode was placed on the forehead.

5 experimental conditions were differentiated for the purpose of the study:

- day-time waking state (*wm*).
- ganzfeld (*gf*).
- waking state before sleep onset, α present (*wa*).
- sleep stage 1 (*s1*).
- sleep stage 2 (*s2*).

Data were collected in five sessions from each subject, arranged within a time period of max. 2 weeks. The day-time waking and ganzfeld sessions took place in the late afternoon, while the sleep onset sessions were arranged early at night, starting typically at about 11pm and taking about 2–3 hours. The subjects could optionally stay to sleep through the night in the laboratory after the experimental sessions were over. Sleep habits of the subjects were inquired after, primarily to exclude any signs of disturbed sleep cycle; there were no individual adjustments to individual bed-time preferences.

In addition to the conditions listed above, whole-night sleep EEG was also recorded; however, these data have not been taken into account in the present study.

The day-time recordings (ganzfeld and waking state) were sampled at 256/seconds (low-pass filtered at cut-off frequency 70 Hz), while whole night recordings were recorded at a sampling rate of 128/seconds (cut-off frequency 30 Hz; high-pass cut-off frequency was always 0.15 Hz). Off-line post-processing of the EEG recordings involved digital filtering (FIR, 1–30 Hz) and tranforming the data from single-electrode reference to average reference.

The usual procedure was used for homogenisation of the visual field in the ganzfeld condition, i.e., applying 2 shaped ping-pong ball halves over the subjects' eyes. As for acoustic homogenisation,

participants wore earphones and listened to a homogeneous sound of a waterfall (we found the natural sound less annoying than pure white noise) at an intensity adjusted to an individually preferred level.

Subjects were sitting relaxed in a reclined chair, while the eye shields were illuminated with red light (60 Watt bulb at a distance of about 1.2 meter). In contrast to the usual practice of ganzfeld telepathy/ESP experimentation, the subjects were not allowed to verbalise continuously; they were prompted by the experimenter for their verbal reports, as described below. Needless to say, there was no attempt to influence the subjects' mentation from outside (no sender, no target).

Experimental schedule started with screening sessions for α–activity and assessment of three mentation reports with synchronous EEG recording. After a whole-night recording to assess a physiological baseline, four experimental sessions followed, alternating ganzfeld and sleep onset sessions. Half of the subjects started with a ganzfeld session while the experiment began with a sleep onset recording for the other half. Three mentation reports were taken during ganzfeld sessions, while five mentation reports ('wakenings') were taken from sleep onset sessions, aiming at different sleep stages (conditions *wa*, *s1*, *s2*). As for sleep stage 1, reports were taken at 10, 20, and 30 seconds, respectively, since α disappearance. Reports from sleep stage 2 were taken 10 seconds after the first visually recognisable sign of the stage (a K-complex or a sleep spindle).

According to the experimental schedule, subjects were given a faint acoustic signal as a prompt for the mentation report. After that, they had to report their subjective experience immediately preceding the prompt signal. When the report was complete, they were asked to rate the reported experience on several self-rating ordinal scales. A questionnaire constructed especially for the purpose of the present study was used, covering areas like sensory perception (presence/absence of sensory modalities, vividness, bizarreness, dynamics), thoughts, feelings, body awareness etc. All reports were taped and later transcribed according to (a simplified form of) the transcription guidelines by Gass et al. (1987).

A total of 241 mentation reports with simultaneous EEG-recordings were collected for the 5 experimental conditions ganzfeld, waking mentation, sleep stage 1, sleep stage 2, and waking state before sleep onset.

For the purpose of this study, the last 10 seconds immediately preceding the prompt were selected for further analyses. Each 10 second epoch was split up in five time segments by 2 seconds each, in the following referred to as $T$–2 to $T$–10, going backward in time. (The restriction to the 10 seconds period reflects the above-mentioned waking criteria applied to sleep stages 1 and 2.) All 2 second epochs of the EEG data were visually inspected and rated for artefacts on an ordinal scale. Only EEG-recordings without any oculomotor artefacts and with no or only minimal EMG contamination, were admitted for further analyses. Due to the artefact rejection the number of valid data epochs was reduced by about 21%.

## 3 Analyses and Results

Due to the large amount of data, EEG data as well as ratings of subjective experience required several steps of preprocessing as outlined below. For the reader's convenience, we present the analyses and their respective results side-by-side, divided into three major blocks (EEG data, experiential data, and correlations between EEG and subjective experience).

*3.1 EEG data*

The primary aim of the first phase of analysis was to characterise the induced states in frequency domain, i.e. in terms of spectral EEG indices; these were then also used to identify EEG correlates of the associated subjective experience. EEG data for all epochs ($T$–2 to $T$–10) was transformed to FFT spectra (frequency range 1–30 Hz, resolution 0.5 Hz). Integrals over frequency bands $\delta$ (1.5–6 Hz), $\theta$ (6–8 Hz), $\alpha_1$ (8–10 Hz), $\alpha_2$ (10–12 Hz), $\beta_1$ (12–18 Hz), $\beta_2$ (18–21 Hz) and $\beta_3$ (21–30 Hz) were computed to assess relative contributions of the separate frequency components (Kubicki et al. 1979). In addition to these seven spectral indices, quotients $\theta/\alpha$, $(\delta+\theta)/(\alpha+\beta)$ (in the following referred to as '*slow/fast*') and $\alpha_1/\alpha_2$ were computed as well. The former were chosen as well-known EEG correlates for vigilance[13] (see Matousek & Petersén 1979), the latter as a simple measure of fine changes in the $\alpha$–peak frequency ($\alpha_1/\alpha_2$). For the final analysis, logarithms of the relative powers and spectral indices were taken (so that distributions of the EEG descriptors are closer to Gaussian distribution). To reduce the dimensionality of the datasets and thus to avoid the problem of explosively increasing number of contrasts to be tested, the results are based mostly on two spectral indices that discriminated at best between the conditions, as specified below.

*Results*

Comparisons of average normalised EEG spectra as well as of integral spectral descriptors obtained for epochs $T$–2 through $T$–10 show rather striking proximity of the ganzfeld condition to the relaxed waking states, at least from the electrophysiological point of view. The EEG spectra for the ganzfeld condition features a well pronounced $\alpha$–peak and no shift towards slow frequencies (Figures 1 and 2) which, on the other hand, is characteristic for the sleep onset. As the true hypnagogic state is confined to the sleep stage 1, this finding alone contradicts the hypothesis of ganzfeld being an experimentally induced hypnagogic state.

Nevertheless, there is an evidence that the brain state in ganzfeld is not identical to that in the relaxed waking states in some respect. Compared to the waking conditions, the $\alpha$–peak in ganzfeld shows a minor shift to higher frequencies indicating higher activation.

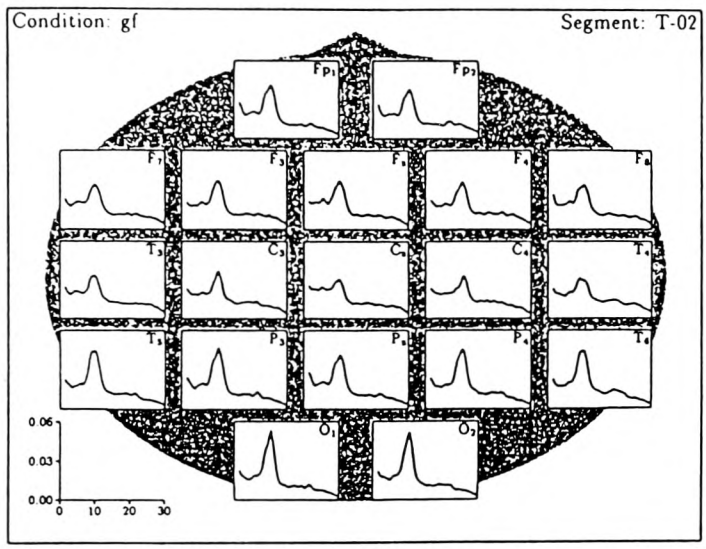
In contrast, sleep stages 1 and 2 both show the characteristic hyperbolic form of the average spectrum and no $\alpha$, as expected (thus confirming the validity of the sleep onset waking criteria). Accordingly, the integral descriptors log $\delta$ and log $\theta$ show higher values in the sleep onset conditions compared to the relaxed waking and ganzfeld conditions which are approximately equal; this holds for all channels and all time segments $T$–2 through $T$–10.

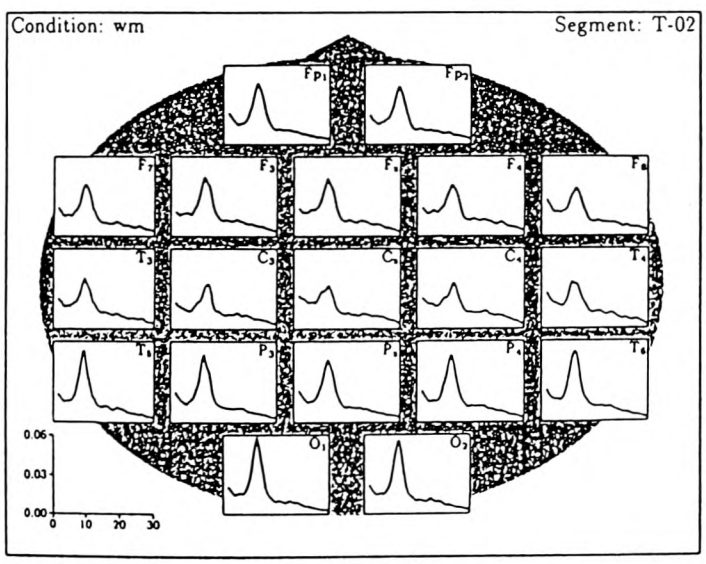
There are differences between the ganzfeld condition and the two waking states conditions in relative contribution of slower and faster $\alpha$–activity in most channels. The effect is most easily seen from comparison of descriptor log $\alpha_1/\alpha_2$ which is significantly lower in the ganzfeld condition. This reflects the shift of the $\alpha$–peak to faster frequencies in the ganzfeld condition (again, this applies to all time segments) as stated above.

[1] Strictly speaking, it is a measure of decreasing vigilance, as the index attains higher values with more $\theta$ and less $\alpha$–activity.

Figure 1

TOPOGRAPHIC SYNOPSES OF AVERAGE NORMALISED EEG SPRECTRA FOR CONDITIONS GANZFELD (*GF*), WAKING MENTATION (*WM*), SLEEP STAGE 1 (*S1*) (EPOCH *T-2*).



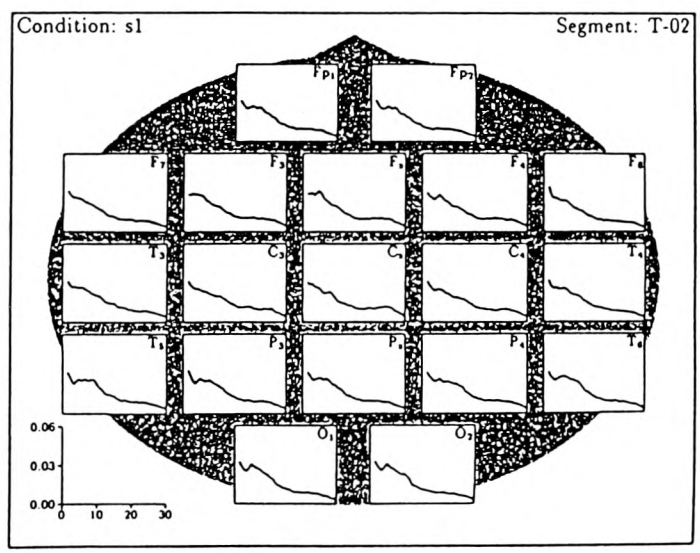



Figure 2
TOPOGRAPHIC SYNOPSIS OF THE AVERAGE VALUES OF LOG (SLOW/FAST) DESCRIPTOR FOR ALL FIVE CONDITIONS *WM*, *GF*, *WA*, *S1*, *S2* (EPOCH *T-2*)

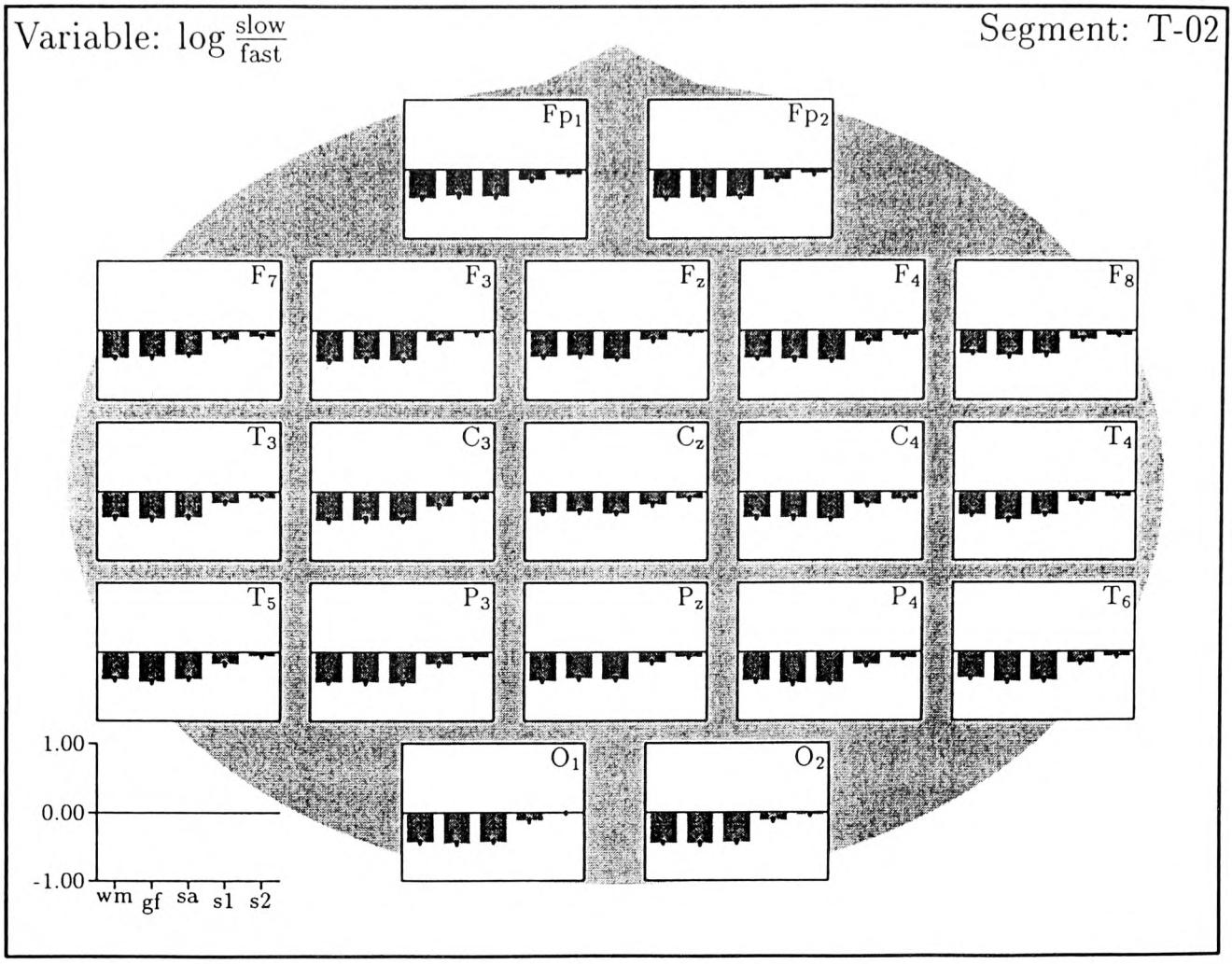



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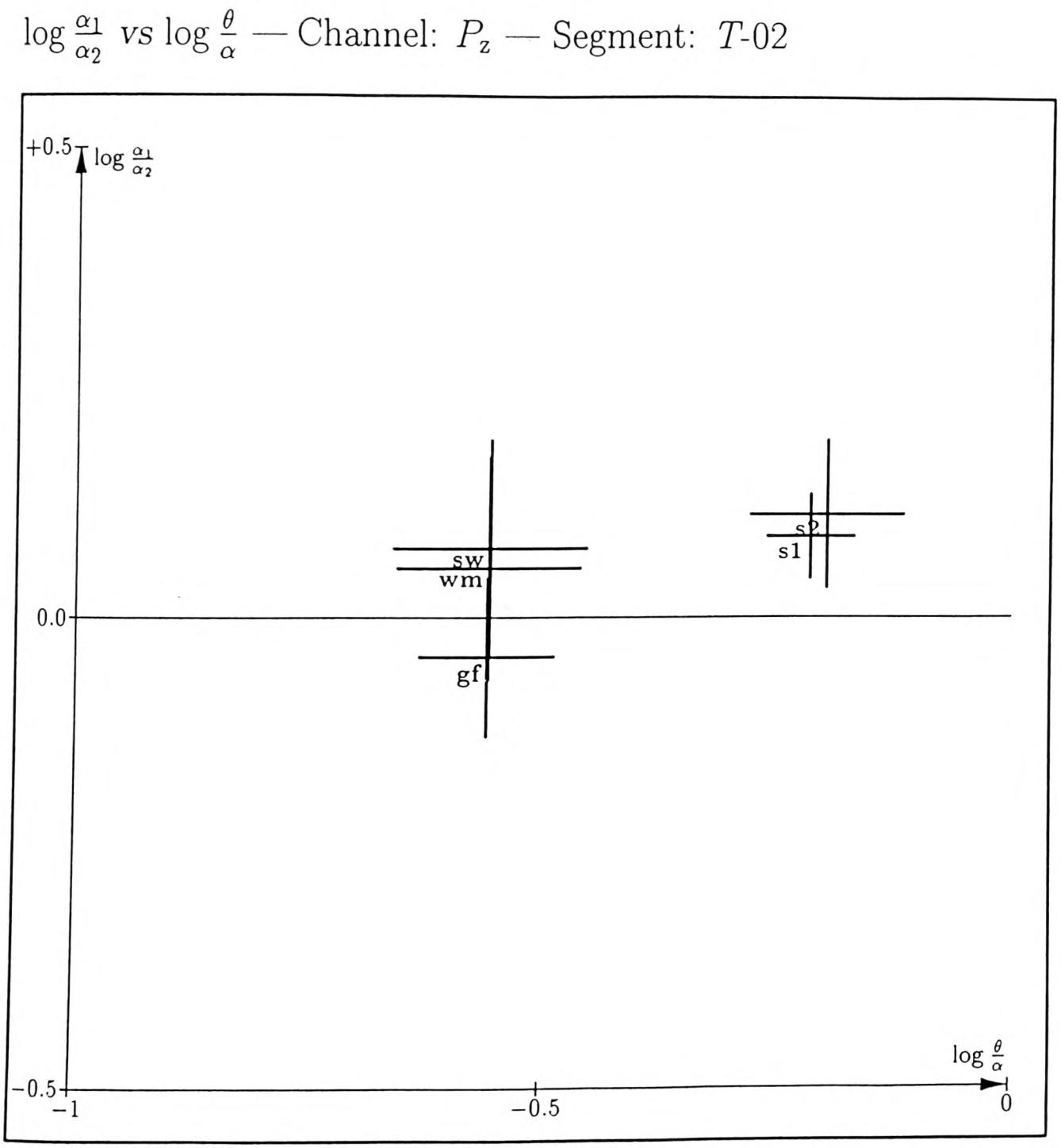
Figure 3 summarises the electrophysiological signatures of the experimental conditions with respect to the logarithmised quotients $\alpha_1/\alpha_2$ and $\theta/\alpha$. In spite of a considerable dispersion within each of the conditions, these two dimensions allow for discrimination between conditions. While the $\theta/\alpha$ dimension (electrophysiological index of vigilance) discriminates between ganzfeld (*gf*) and waking states (*wm*, *wa*) on one hand, and sleep stages 1 and 2 (*s1*, *s2*) on the other hand, the other dimension allows for discrimination between the day-time and before-sleep waking states and ganzfeld.

Figure 3

LOG $\alpha_1/\alpha_2$ VS LOG $\theta/\alpha$ (CHANNEL $P_z$, TIME EPOCH *T*–2). CROSSES MARK ESTIMATED MEANS ±1.96 S.E. FOR THE EXPERIMENTAL CONDITIONS. SYMBOLS: DIAMONDS = DAY-TIME WAKING (*WM*), ASTERISKS = GANZFELD CONDITION (*GF*), OPEN CIRCLES = WAKING BEFORE SLEEP ONSET (*WA*), DOTTED CIRCLES = SLEEP STAGE 1 (*S1*), FILLED CIRCLES = SLEEP STAGE 2 (*S2*).



*3.2 Subjective Experience*

The aim of this phase of data analyses was to extract global descriptors of the induced subjective experiences such that they could be related to the EEG descriptors. What we needed was an efficient reduction of data dimensionality as the number of correlations between EEG variables and primary experiential variables would exceed any reasonable limit. Therefore we opted for the Principal Component Analysis (PCA) as a standard solution to the problem.

Since the ratings were done on ordinal (1–5) scales, the first step aimed at the transformation of ordinal data to its (quasi)metrical equivalent, applying the area transformation to the empirical distributions of the ratings and thus enforcing the standardised Gaussian distribution (zero mean and unit standard deviation). Missing values were replaced with the population mean (zero). From 39 transformed scales 7 were removed because of more than 66.6 % missing values. Of the 32 remaining scales, only 5 had less than 80% valid ratings. The PCA solution was then obtained by extracting eigenvalues and eigenvectors of the $32 \times 32$ matrix of covariances between those 32 transformed variables.

*Results*

Four orthogonal factors (unrotated principal components) were extracted from the data, applying Cattell's (1966) scree test to the distribution of the eigenvalues. These four factors explained about 35% of the total data variance. Due to the enforced constraints of the data transformation, population means were zero for all variables and thus all factors were bipolar with mean value 0.

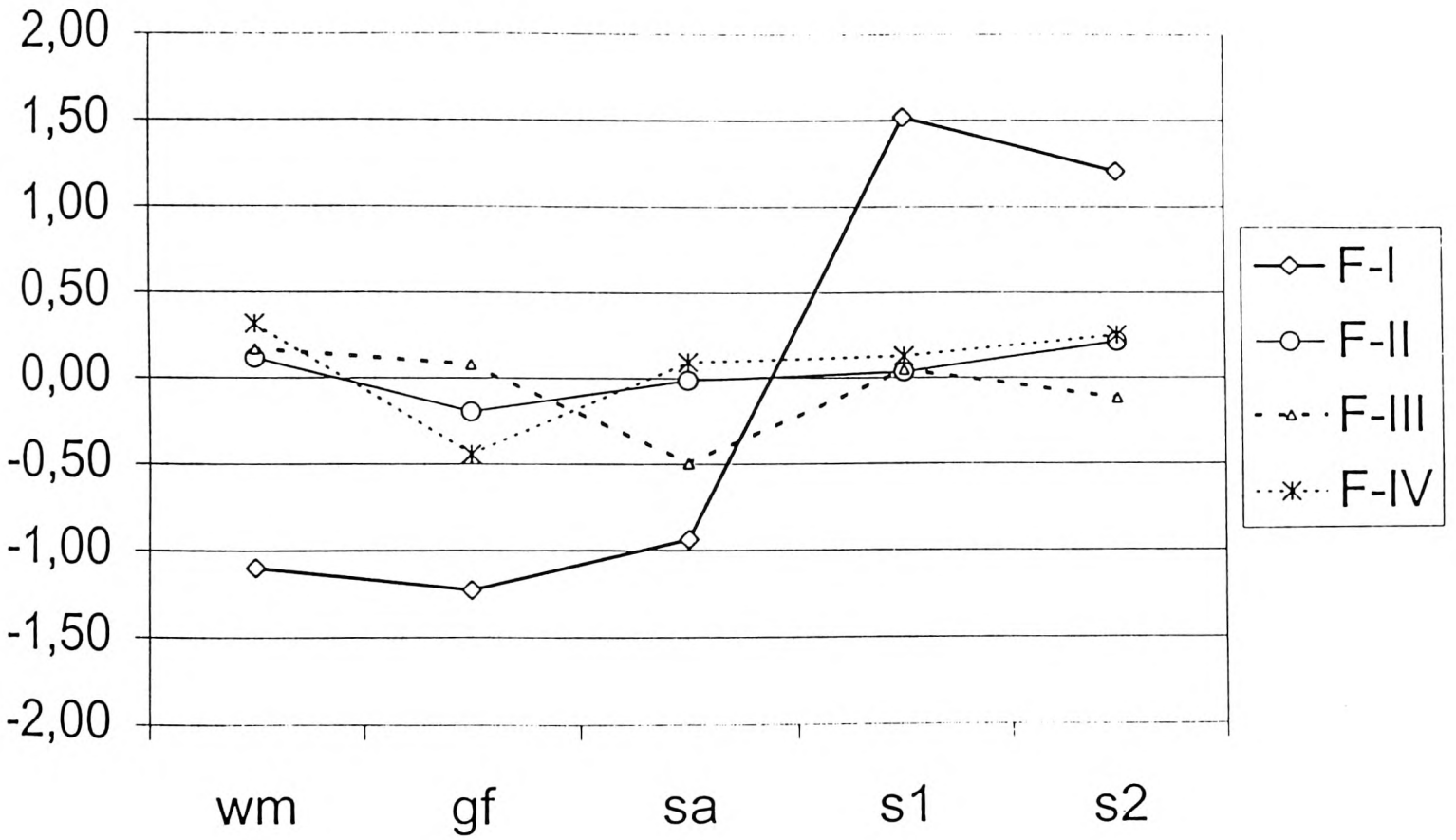
Factor I could be easily interpreted as the subjective dimension of vigilance[2,4]; primary variables with highest loadings on this factor were scales assessing subjects' losing awareness of the experimental situation, their reported sleepiness and inward attention. Factor II represents easiness/difficulty in verbalising and rating the experience. Factor III asseses sensual richness and vividness of the experience, and also alterations of time sense and body awareness. Factor IV reflects presence of thinking and reflective self-awareness.

For every factor univariate ANOVAs were computed to test for differences between the experimental conditions (no account for repeated measures). Figure 4. displays the mean values of the four factors for each of the five conditions. We can immediately see that Factor I discriminates again between ganzfeld and waking states on one hand, and the sleep stages 1 and 2 on the other hand; Factor I showed the most significant effect ($F_{4,\ 236} = 66.88$, $p < .00001$). This finding in the domain of subjective experience conforms very well with that obtained by objective electrophysiological measures (EEG). Again, the hypothesis of ganzfeld being close to the 'true' hypnagogic state seems unsupported. Mean values of Factors II and III did not differ significantly between the conditions. Interesting but difficult to interpret was a significant effect for Factor IV; post hoc contrasts (Tukey) revealed that this effect was due to a small but significant difference of the ganzfeld state versus all other conditions. Given the tentative interpretation of Factor IV above and the *negative* sign of the effect, this finding seems to indicate a tendency to being absorbed by the ganzfeld experience.

[2] Note that the factor is sign-reversed, i.e. lower values indicating higher values and *vice versa*, and thus *positively* correlated with the EEG measure of vigilance log $\theta/\alpha$ (cf. footnote 1)

Figure 4

MEAN VALUES FOR THE 4 PRINCIPAL COMPONENTS OF EXPERIENTIAL DATA FOR THE FIVE EXPERIMENTAL CONDITIONS



*3.3 Correlations between EEG and subjective experience*

The relationships between the brain electrical activity and the state of consciousness, i.e. between the EEG descriptors and the experiential variables were evaluated by computing Pearson's correlations between the logarithmised band power indices and scores on each of the four principal components ($10 \times 4$). This was done for each channel (19) and each time segment (5), thus resulting in 3800 correlation coefficients. The correlation matrices were censored at level $|r| > r_{crit} = 0.239$, where $r_{crit}$ is the critical value of Pearson's correlation for $p$=0.001 and $n$=184 (the latter being the least number of usable EEG epochs).

To assess the degree of generalisation (global or localised topography) of the correlations between EEG and experiential variables, number of channels featuring significant correlations was evaluated for each of five time segments and all four factors of subjective experience. Yet another interesting aspect of the EEG/experience relationship is the stability of the correlations in time. This was evaluated by computing Spearman rank correlations between $|r|$ and ordinal number of time segments (backwards in time); a rank correlation $|R_S| \geq 0.9$ indicates a significant ($p < 0.05$) decrease of relationship backwards in time.

*Results*

For all time segments there are consistent and global correlations between the $\delta$, $\theta$ and $\alpha$ bands and Factor I (vigilance factor). Only the $\beta_2$ band showed also significant but less global correlations with Factor I (7 channels, posterior and temporal, $r$ between –0.24 and –0.45). Slower components ($\delta$, $\theta$) correlated positively with Factor I while the faster frequency bands did so negatively. The remaining three factors showed no consistent pattern of global correlations with the EEG; only very few channels still correlated after censoring.

Magnitude of correlations was mostly much higher than the cut-off value $r_{crit} = 0.239$, with 57% coefficients above 0.5 and values up to 0.6 for the $\delta$ band. Relationships between $\theta$ and $\alpha$ on one hand, and Factor I on the other hand was less pronounced but still above the cut-off threshold.

As one could expect, all channels showed significant and stable correlations between Factor I and log $\theta/\alpha$ as well as log *slow/fast* in every time segment.

## Conclusions and Discussion

The results of our study do not support the hypothesis according to which ganzfeld induces an 'artificial hypnagogic state'. The electrophysiological signature (frequency spectrum of ongoing brain electrical activity) of ganzfeld is far more similar to that of a relaxed waking state than to that of true hypnagogium. Regarding the vigilance dimension (applying both subjective and objective measures), ganzfeld is not distinguishable from relaxed waking states.

On the other hand, we found a significant difference between ganzfeld and waking states under eyes-closed, no-stimulation conditions, namely a shift of the $\alpha$–peak toward faster frequencies in the ganzfeld condition.

This may seem fairly surprising as one would expect rather reduction of $\alpha$ under sensory stimulation; however, the ordinary $\alpha$–attenuation reaction is normally observed with structured sensory input and focused attention, which is not the case with ganzfeld.

Thus we may hypothesise that the observed effect is specific for unstructured sensory input (due to the homogenisation of the sensory field in two most important modalities). It remains so far unclear which component of the composite stimulation condition is responsible for the effect in question: whether the

acoustical or the visual component alone, or their synergic action. These modality-specific effects shall be subject to further exploration in our next experimental study.

All this, of course, does not mean that a genuine hypnagogic experience cannot occur during a ganzfeld session. Firstly, as mentioned in the Introduction, the ganzfeld procedure has been successfully utilised by other investigators to induce a state of decreased vigilance (drowsiness); secondly, as probably all ganzfeld experimenters would confirm from anecdotal evidence, some subjects may fall asleep during a ganzfeld session. There is, however, several distinctive points: (i) intention of the experimenter, and, consequently, (ii) the time of day (position within the diurnal sleep/wake cycle, (iii) sleep propensity of the subject at time of session, and (iv) the duration of the session.

In experiments referred to by Bertini et al. (1969), the sessions, arranged at the pre-sleep time, continued until the subjects' reached a considerably impaired degree of vigilance, as can be inferred from their highly disorganised speech. On the other hand, in parapsychological research, a typical ganzfeld session is of shorter duration and not intended to match subjects' sleep habits. In addition the permanent task to verbalise one's imagery represents an activation condition per se; it is unlikely to obtain a usable verbal record from a subject reaching and maintaining the sleep stage 1.

At any rate, it should be emphasised that a merely subjective reference to a 'dream' or 'dream-like' experience provides no sufficient evidence for the hypnagogic character of the experience. Subjects may well not distinguish between 'true dreams', hypnagogic imagery and vivid visual impressions from whatever sources. The only applicable, objective criterion is the electrical activity of the brain as an index of the brain's functional state. A note made by Bertini et al. (1969) may be of interest in this context; they reported of one subject having had a "brief dream" (labelled so by the subject himself) while his EEG "showed a fully waking record". We might assume that this, for the authors surprising, observation corresponds to ganzfeld imagery associated to wake-like brain activity in our study.

It would be premature to attempt hypotheses about specific action of the ganzfeld in terms of brain physiology; the present results only allow us to conclude that the ganzfeld phenomena cannot be reduced exclusively to the vigilance dimension. The relationships between variations of the sensory input and varieties of states of consciousness may be more complex than we thought. For example, in a study conducted by Kondakor et al. (1997) effects of enabled/disabled visual input (eyes open/closed) onto brain electrical activity were studied, using frequency band specific source localisation methods and complexity measures; it has been shown that the variation of visual input involves the entire spatial pattern of activation of the brain. Such global restructuring of the brain activation pattern is unlikely to be limited to structures involved in processing of the visual information; probably it entails the brain in its entirety and may thus lead to a global state-shift.

This point of view matches well with our general approach to assessment of the functional states of the brain as global conditions of conscious experience. From this perspective (Wackermann 1999), the relationships between states of consciousness and brain functional states are studied as *many-to-many* correspondences between varieties of states in their respective state-spaces, rather than one-to-one correspondences between singular states. The finding reported in the present paper thus can be also reworded as follows: similar states of consciousness, featuring rich endogenous dream-like imagery, can be reached from two physiologically different states of brain, the hypnagogic state and the states induced in ganzfeld. However, for the sake of clarity, the term 'hypnagogic' should stay reserved for those states that are associated to sleep onset (hypnagogium); a broader term covering true hypnagogic state as well as other states able to produce similar imagery should be found (e.g. 'hypnagogiclike' as proposed by Schacter [1976], or perhaps 'hypnagoid', which seems more plausible from the linguistic point of view).

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# SYMPOSIUM: RSPK AND HAUNTS

# POLTERGEIST AND SPACE-TIME[1] : A CONTEMPLATION ON HANS BENDER'S IDEAS ABOUT RSPK

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> It would be most satisfactory of all if physics and psyche could be seen as complementary aspects of the same reality.
>
> Wolfgang Pauli

## ABSTRACT

This paper explores three issues, the evidence for RSPK, the space where it occurs and the energy that underlies the phenomena. Roll summarizes three of his investigations where he considers the evidence for RSPK especially convincing, the Miami case, the Olive Hill case, and a study at Spring Creek Institute, Chapel Hill, North Carolina. In Miami he and J.G. Pratt set up a test for macro-PK by using drinking glasses and other objects as targets and placing them in the active areas. Ten of the targets moved when no one was near, including Julio, the 19-year-old agent. In Olive Hill, Roll and John Stump saw the movement of several objects from beginning to end when they were watching Roger, the 12-year-old agent, and when he could not have interfered with the objects. At Spring Creek, where 14-year-old Tina Resch was being tested for micro-PK, there were RSPK object-movements during rest periods, including eight targets from a table to which the girl had no access.

In the Tina Resch and other cases, there were reports of objects appearing or disappearing from closed space. Hans Bender and George Owen noted that such events could occur if the world has four dimensions; objects moving in space-time beyond the window of human perception would then seem to appear or disappear. Roll notes that this is what happens to our thoughts and feelings when we remember and forget. If „psyche and matter (are)..inseparably entangled," as Bender proposed, objects that are forgotten might actually disappear and remembered objects might return. To allow for such possibilities, Roll suggests that we imagine that objects have a fifth aspect or dimension which is experienced as meaning. This accords with common experience and provides an understanding of psi. In ESP the meaning of an object is present although its material form is absent; in RSPK the agent interacts with the meaning of the object and thereby with its physical condition.

Studies of the agent, the times and places where RSPK is observed, and the occurrences themselves, suggest that RSPK is due to a mental energy that interacts with physical energies, including electromagnetic energy. A large proportion of RSPK agents show symptoms of complex partial seizure (CPS), that is, they are subject to sudden electromagnetic discharges in the brain. It is unlikely that these are of sufficient amplitude for RSPK. Bender (and Owen as well) thought that the agent might organize rather than generate the needed energy. There is some support for this since RSPK tends to occur at times of increased geomagnetic activity. The RSPK occurrences themselves suggest a wave process because they decrease with increased distance from the agent.

On the basis of these and other observations, Roll makes a series of predictions about RSPK:

RSPK agents will predominantly be 12-14 years old, be of either sex, show symptoms of CPS, exhibit brain-stem anomalies, and be subject to psychological stress. RSPK object-movements will show exponential decline

[1]Thanks to the Institut für Grenzgebiete der Psychologie und Psychohygiene e.V., Freiburg i. Br. Germany for support in the preparation of this paper.

with increased distance from the agent, repeatedly involve the same object, type of object and area irrespective of distance from the agent, involve objects and areas that are emotionally meaningful to the agents and people with whom the agent interacts, generally last less than three months, originate at times of increased global geomagnetic disturbance and occur in places with above-average local geomagnetic and electromagnetic amplitudes. In tests for macro-PK, visual observation of objects will impede their movement, and attention to the agent, including visual observation, will facilitate the movement of objects.

Roll completes his paper with Jahn and Dunne's proposal to regard the union of mind and matter as an example of the complementarity relation rather than an irreconcilable contradiction.

## INTRODUCTION

When I began to do research in parapsychology, I was only interested in experimental work. But like many others I was unable to repeat my initial success. My first experience of psi was a poltergeist case in Seaford, a small town outside New York, which Gaither Pratt and I explored in 1958 (Pratt & Roll, 1958; Roll, 1968). Since then I have been a poltergeist fan. I am in good company. Hans Bender (1974), the founder of the Institut whose 50th anniversary we now celebrate, found poltergeist phenomena to be "*via regia* or royal road to an extended understanding of man, of his position in nature and of nature herself." (p. 142) There is a tamer term for poltergeist, RSPK or recurrent spontaneous psychokinesis. Instead of supposing that the occurrences are the antics of an incorporeal entity, Bender and most other modern researchers have supposed they are expressions of the embodied minds found at the center of the activity.

In this paper, I explore three issues, the evidence for RSPK, the space where it occurs and the energy that underlies the phenomena. The first task is to determine if the occurrences can be explained in terms of known physical processes. Insofar as the activity depends on the presence of one or more persons, nonhuman forces can usually be excluded from the outset. The question then becomes whether the people at the center of the events cause them fraudulently. To determine this issue and, if warranted, to explore the RSPK process, an experimental approach may be combined with field investigations. Bender used this approach in several cases, the tests by two physicists in the Rosenheim case perhaps being the most successful (Karger & Zicha, 1971). More recently, David Fontana (1991, 1992) has been able to provoke RSPK stone throws in a machine shop in Wales.

For me the question about the reality of RSPK was decisively settled by our investigations in Miami, Florida; Olive Hill, Kentucky; and Chapel Hill, North Carolina.

## THREE EVIDENTIAL CASES

*Miami, FL: An Experiment at an RSPK Site:*

When Gaither Pratt and I (Roll & Pratt, 1971) arrived at Tropication Arts, a warehouse for novelty items in Miami, Florida, the police had noticed that there were certain shelves from which things were more likely to take off then others; so-called area focusing. The incidents were rarely seen, and when news media pointed their cameras to the active sites, this too inhibited the occurrences. Since direct observation suppressed the activity, the officers used empty soft drink bottles as "decoys" placing them in the special sites. Several crashed to the floor when no one was near, including Julio Vasquez, a 19-year-old shipping clerk who seemed to trigger the incidents. There had been object focusing as well, beer mugs and "Zombie" glasses being especially active. Since direct observation inhibited the events, we set up an experiment by using these types of objects as targets for macro-PK, placing them in the special sites, and having the owner and employees stay away from these parts of the warehouse. In this way we could be certain that no one except ourselves were near the targets. For instance, I was watching Julio place a toy alligator on a shelf when a

Zombie glass four feet behind him fell to the floor. Both his hands were occupied; in the right he held the alligator, in the left his clipboard. Two other workers were present but they were more than 15 feet from the glass. They could not have picked it up previously and then thrown it because I had placed the glass on the shelf and no one had been near since then. The incident had an intriguing aspect. I wanted to find out if the objects simply slid off the shelves or if they could be made to rise up in the air. I had therefore placed some notebooks in front of the glass and other objects along the sides. These were undisturbed, so the glass must have moved up at least two inches before falling to the ground. Later a box of ten beer mugs I had placed as a target on the shipping desk crashed to the floor two to three feet away. Julio was five feet from the desk, walking towards me and away from the desk. I was looking directly at him when the box came down. The only other employee present was behind me.

The Zombie glass and the box of beer mugs were among ten target objects that moved from an experimental area under the following conditions. Pratt or I had previously examined the object and the area where it was placed; one of us had the area under surveillance from that time and until the event; and one of us went to the area immediately afterwards, and before any of the employees, and again examined the object and area. The two incidents were also among seven when Pratt or I had Julio in direct view at the time. We could not account for these events except by macro-PK.

Mischo (1968) has suggested that the objects affected by RSPK are "substitute objects" that represent people associated with the objects. The Miami case is a good example. The events mostly consisted in the movement and breakage of merchandise belonging to the owner. According to Gertrude Schmeidler, who analyzed the TAT and Rorschach (in this study as in most of our others) Julio regarded the owner as "phoney and cheating." (Roll, 1972, p. 171) There was a subtle change during our investigation. Pratt and I hoped to witness the occurrences, and after a few days things began happening in our presence, often when we were looking at Juilio. It seemed as if he was rewarding our attention with object-movements. The breakages would probably have continued whether we were there or not but they would obviously not have involved the objects we set out. The *meaning* of the events had changed and thereby the course they took.

*Oive Hill, KY: Direct Observation of Moving Objects:*

John and Ora Callihan had seen most of their crockery lamps, porcelain figurines and other breakables carried out as buckets of shards (Roll & Stump, 1969; Roll, 1972, Ch 11). The Callihans occupied a four-room house in Olive Hill, a small town in the Kentucky mountains with their grown daughter. When their 12-year-old grandson, Roger visited to help with chores, he would share their bedroom. To escape the "raw gas" they thought caused the incidents, they moved to another house. After about a week, the occurrences started up again, and then spread to Roger's own home. He was present during 178 of the 199 reported incidents. When John Stump, a research associate from the Psychical Research Foundation, arrived things had been quiet for two days but the next day there were more than 50 incidents. It seemed that the poltergeist liked the attention; and it was not shy about performing in front of strangers.

One time John was in the grandparents' living room looking at Roger, who was sitting with his back to the TV when there was a loud crack. Roger jumped away and John saw a cloth doily and a large plastic bowl on the TV fell to the floor behind the set, while the plastic flowers that had been in the bowl remained. Then the flowers slowly moved off the set and also landed behind. Here he found the three items arranged as before, the flowers in the bowl and the bowl on the doily. At the same time these objects moved behind the TV, a clock that had also been on the set moved forward, landing on the floor in front of John, about four feet from the TV. Two Chinese plaster of Paris figurines remained in place. John found no strings or other contrivances and it seemed impossible that Roger or anyone else could have caused the events normally.

I came three days later, and joined John, Roger his parents and younger sister at their home. Until then the object-movements had been confined to grandparents', but this changed after our arrival. Shortly after midnight Roger went into the kitchen with me trailing behind, when the kitchen table flew up, rotated 45 degrees and fell down on the backs of the chairs that stood around it, its four legs off the floor. When this happened, both the table and Roger were in full view. The boy had just turned around, and was facing me when the incident took place.

I was impressed. The event took place right in front of my eyes and it was substantial. Helen Callihan, Roger's mother, had served us coffee at the same table a short while before, and the cups and plates crashed to the floor. I was prepared that something might happen. There had been several incidents when Roger was by himself so I stayed close. He and I were alone in the kitchen and I could find no contrivances to cause the event. Five minutes later Roger went into the living room and was facing me, when the coffee table behind him flipped upside down. There was no normal way for him to have done this. Beverly, his sister, was sitting next to the table in my line of vision. She might have touched it but could hardly have turned it upside down without detection. John and I estimated it weighed at least 60 pounds.

Finally, when I was standing in the doorway between the living room and the children's bedroom, a bottle came off the dresser and landed four feet away. I was facing the dresser and saw the bottle in the air. It did not slide off and roll into the room but was clearly airborne. When this took place, Roger was in my peripheral vision on my right in the living room, walking away. Beverly was standing slightly behind me on my left; there was no one else in the room. The bottle had been involved in an earlier incident I had not observed. At that time I checked it and the dresser for mechanisms that might have been involved in a fraudulent scheme. I could discover no way in which this event could have been produced normally by Roger or anyone else in the family.

I speculated that Roger had been upset at spending his time with the grandparents and that this was part of the explanation for the RSPK breakages in their home. The increase in occurrences when John arrived, and the inclusion of Roger's own home when we were there, I thought might have been due to the attention we paid the boy. As in Miami, the presence of the researchers seemed to have changed the meaning of the events and thereby the events themselves.

I had hoped to bring Roger and Beverly to Duke University for psychological tests but the parents would hear none of it, even if they went along. Mrs. Callihan had formed the opinion that the occurrences were caused by a demon and that far from being helpful, John and I had brought the demon from the grandparents' house to hers. She said that the phenomena had to stop and that she must ask us to leave, hoping the demon would follow us to Duke. This did not happen.

*Chapel Hill, NC: RSPK in a Laboratory:*

Dr. Stephen Baumann, a neuropsychologist at the University of North Carolina (Baumann,1995) was setting up tests for micro-PK at Spring Creek Institute in Chapel Hill. When the equipment was ready, in October 1984, Tina Resch was invited to participate. The previous March, the 14-year-old had been the center of massive destruction in her home in Columbus, Ohio. The case did not seem promising at first. Before I arrived, a TV news crew had filmed Tina pulling over a lamp, and the incidents that took place the first three days I was in the home could have been faked. But then there was a string of occurrences in my presence that I could not dismiss. The first involved an empty teacup I had just placed on Tina's bedside table which flew 12 feet when she was in view on the other side of the bed. Shortly afterwards my tape-recorder and a pair of pliers I had just put down moved several feet. When I brought her to North Carolina, the incidents continued in my home, at the office of James Carpenter, a parapsychologist and psychotherapist, and in the presence of another psychologist.

By the time Baumann was ready, the activity around Tina had died down (except for the bending of four eating implements). To reactivate the phenomena, we decided to use hypnosis (Stewart, Roll & Baumann, 1987). Bender (1974) regarded post-hypnotic suggestion as a promising means to facilitate RSPK though his own attempts had not been successful (p. 130). A psychotherapist, Jeannie Stewart (now Dollar) hypnotized Tina in the garden of my home in Durham where she was staying. Ms. Stewart was counseling Tina and participated in the research. The focus of the procedure was to evoke the bodily sensations associated with the occurrences. Ms. Stewart asked Tina to recall an RSPK episode and pay attention to the way her body felt. Tina said her head and stomach hurt, as they had during the RSPK events, and Ms. Stewart suggested that the sensation in the stomach could be one of warmth and that instead of the headache there would be a sense of excitement. When Tina said she felt the warmth, Ms. Stewart asked her to visualize the movement of one of the objects that had been placed on a table. Four were the eating implements she had bent at home and the others were personal items. When Tina looked scared, Ms. Stewart encouraged her to talk about how frightening the past events had been, and suggested that things might move in a way that was harmless and exciting. Nothing happened, and they got up to get a drink. As they walked towards the house, one of the spoons fell to the ground. Ms. Stewart was not watching the girl so it was possible she had thrown it. After having checked that all objects were on the table, next time Ms. Stewart had Tina walk in front. As the girl approached the door, a deodorant stick moved to the ground six feet from the table. Ms. Stewart was watching Tina and saw no unusual movements. Next a spoon moved three feet when Tina was inside the house with Ms. Stewart. Finally, when Tina once again was walking from the table to the house, Ms. Stewart saw something hit Tina's head and found the fork on the ground. Tina cried, "stop hurting me," and flung the fork away.

The question at the back of my mind when I brought Tina to Spring Creek was whether PK could be used as an adjunct to medical treatment. Dr. Baumann (1995) did two tests with Tina, in one she tried to influence electric discharges from a nerve cell, in the other from a piezoelectric crystal. This material is found in teeth, bone and connective tissue. The results were promising but there were problems in the test procedure that made them difficult to evaluate (see the Appendix for two recent cases of RSPK where the agents are practicing psychic healing).

The RSPK continued at Spring Creek during breaks in the tests for micro-PK. There were no object-movements when Tina attempted to affect the neuron and crystal. She was evidently able to control the timing of the events as well as the targets. The PK machines and computers were spared, the occurrences being restricted to tools and laboratory equipment of little value.

Since Tina had a degree of control over the occurrences, albeit unconscious, we set up a table with PK targets. If any moved, we would know where it came from. As a further record, I focused a video camera on the table. I had tried to film the occurrences in Tina's home, but the activity stopped when the camera was operating. It seemed that the best chance of recording a moving object was to use a concealed camera so Tina would not know she was being filmed. Dr. Baumann, however, felt it was unethical to film without Tina's permission. She gave it but the activity ceased. The occurrences resumed after the camera had been dismantled.

Tina was not allowed near the target table, otherwise her movements during the rest periods, when the macro-PK occurred, were not restricted. When there was a sound of an object hitting the ground, everyone froze in their positions so that these could be recorded. The heaviest target to move was a 12 inch socket wrench. When Ms. Stewart and Dr. Baumann were standing between Tina and the target table and facing her, there was a loud noise from the hallway behind the girl. The wrench had hit the open door to a storage room, several feet behind Tina, and landed inside. An indentation showed the point of impact. It had

traveled 18 feet in a curved path, passing the two experimenters and Tina without notice, and moving another four feet after hitting the door. It was a powerful flight. Most of the targets were too small to cause damage. I was seated at the table when a small plastic level disappeared without notice. It evidently moved down the central hallway, making two turns and traveling about 38 feet to the room where Ms. Stewart and Tina were standing. Ms. Stewart heard a sound behind them and found the level on the floor. When this happened Tina had both hands in her purse searching for her plane ticket. Another time I was sitting at the table and watching Tina seat herself by the window, when a battery hit the window above her head. Ms. Stewart sat opposite Tina and also had her in view. A minute later, when they were in the same positions, an "L" bracket hit the window. Both were PK targets. Then, as I was looking at Tina, we heard a sound and found a drill bit from the table on the floor about ten feet away. Tina was standing quietly with her back to the room, her hands resting on either side of the door frame. Altogether, there were 21 movements of objects when Tina was under observation, of which eight came from the target table.

The first test of the Resch phenomena were done by an electrician the family had called when lights and electrical appliances turned on by themselves (Roll, 1993). Bruce Claggett found nothing wrong and supposed that Tina surreptitiously turned on the switches. He therefore taped them down with scotch tape to prevent tampering. "I stood where I could see four switches at once and I said to myself 'This isn't going to happen, nobody can touch those switches without breaking the tape or making a concerted effort.' And the overhead light in the kitchen came on... I knew then in my own heart and my own mind that nobody was playing tricks then because I personally saw it. When the lights came on, my eye immediately went to the switches to see which set was coming on. The tape on the two in the family room that controlled the kitchen light was gone. It just wasn't there. And the switches were in the up position. Those were the switches that had turned on the lights. And nobody had been near the switches."

Following this, Claggett did an experiment. After Mr. and Mrs. Resch had gone on an errand and only Tina and four young foster children were home, Claggett made a circuit through the ground floor of the home, turning off lights and taping down switches as he went. "I insisted (Tina) stay right beside me...and not get ahead of me. She did this, and I can't remember a time she was out of my sight during the next three or four circuits we made." "As fast as I'd tape lights down, I'd look over my shoulder and see the lights come on. I'd look at the switch that controlled that particular light and there is no tape there and there is no one in the house except Tina and I, and four little foster kids who were playing in the family room and sort of oblivious to what was going on at that time." (The family room was outside the circuit.) Claggett never saw a switch move. "At one point I decided to try to catch one in motion. I sat in the living room with my eye on a switch for 15 minutes and nothing occurred."

It is doubtful that the focusing on light switches would have happened if Claggett had not been present, certainly his Scotch Tape would not have disappeared. It seemed that Claggett's interest in the events matched Tina's need for attention; the occurrences were meaningful to both. After Claggett's visit there was much breakage of glass, throwing of food and flights of objects, some of these hitting Tina. Mischo (1968) found that "short impulses of aggressiveness and destructiveness are in most cases not openly directed against their object, but are displaced onto substitute objects." With respect to Tina, the occurrences seemed to reflect her feelings about her family and herself (Carpenter, 1993). But when Claggett was with the girl, and later when she came to North Carolina, the incidents lost their angry edge. From being destructive the RSPK became supportive of Tina's social relationships.

## RSPK AND HIGHER DIMENSIONS OF SPACE

In his presidential address to the Parapsychological Association, "New Developments in Poltergeist Research," Bender (1969) relates how a lawyer who had taken an interest in RSPK (his office was the scene of the Rosenheim events) did an experiment in the home of a family in Nickelheim where RSPK was reported in proximity to the 13-year-old daughter. The family had told him that objects which disappeared from the home would fall to the ground outside. The lawyer placed a bottle of perfume and a bottle of tablets on the kitchen table, asked the family to go outside, then closed all windows and doors and went outside himself. "After a short time, the perfume bottle appeared in the air outside the house, and a bit later on, the bottle of tablets appeared in the air at the height of the roof and fell to the ground in a zigzag manner." (p. 96). This is reminiscent of a morning in the Resch home. Mrs. Resch was making breakfast when she said the eggs flew up from the carton and smashed against the ceiling. To preserve those that were left, she asked Tina to put them in the refrigerator. When the girl had done so and closed the door, Mrs. Resch said, the eggs continued to come out and break. She did not actually see this, but Tina claimed she saw an egg penetrate the door. The event is of little evidential value but is similar to other cases of RSPK where objects were said to move out of or into closed space. Bender considered the hypothesis of a higher space or a fourth dimension for such occurrences and for objects that appear or disappear instantaneously. George Owen (1964, p. 294ff) explored the idea of higher space for the same reason.

Like other theories in science, a theory for RSPK must enable us to understand the phenomenon and increase our ability to predict it. The concept of four-dimensional space, or space-time, may be a beginning. Four dimensional maps are not as esoteric as they once were. To Stephen Hawking (1988) the world of human-scale objects has four dimensions, three of space and one of time; there are objects with higher dimensions but they are too small to be experienced. According to Hawking, the 4-D map has three arrows of time that point in the same direction, from the past to the future: the cosmological arrow of time, which gives the direction in which the universe is expanding; the thermodynamic arrow of time which gives the direction in which entropy increases; and the psychological arrow of time, "...which is the direction in which we remember the past but not the future." (p. 145). The last statement does seem to make sense. We remember the past *in* or *from* the present; that is, the arrow of time points from the present to the past when we remember or recall the past. We may agree with the Red Queen in Alice in Wonderland that "It's a poor sort of memory that only works backward," but that is the way memory works. (Hawking may have meant "learning" rather than "remembering"; in learning the arrow of time can be said to point from the past to the present or from the present to the future.)

The memory arrow may be different in another respect from the other two. The cosmological and thermodynamic arrows of time are uninterrupted or continuous, the memory arrow is often discontinuous. We may remember a past event without being aware of a train of memories or associations leading from the past to the present. There may be molecular or other processes that underlie memory and are continuous, but from a phenomenological perspective memory is often discontinuous.

The suggestion that the lived world is four-dimensional rather than three-dimensional makes good sense. If it were not for their extension in time, three-dimensional objects could not be experienced. Things have to last at least for a fraction of a second to be seen, and longer to be experienced as material objects.

In considering RSPK the psychological aspect of objects cannot be ignored. As Bender (1969) said, "psyche and matter (are)...so inseparably entangled that the discrimination between an external (physical) and an internal (psychological) aspect might...be an inadequate way to grasp what essentially happens."

The same applies to ordinary experience. In addition to their sensory side objects have a meaning quality. Meaning, in either the cognitive or conative sense, rests on memory; that is, the meaning of an object depends on our memory of the object or of the class of objects to which the object seems to belong. It is the meaning of things which determines our movement in space-time, which makes us approach some objects and spurn others. This movement may be illusory from the view of higher dimensions, but from a biological perspective emotion moves us mentally and physically and cognition charts the terrain. Sometimes the meaning of the object is the only aspect present to experience. In extrasensory perception (and in subliminal perception, Dixon, 1989) where the sensory aspect of the object is missing, its meaning may be apprehended.

May emotion move things out of view, into space-time? If matter is connected to meaning and memory, this may become a possibility. If we suppose that the material component of an object is tied to its meaning and memory components, the object may disappear into the past when it is forgotten (repressed, etc.) to be recalled or not as the case may be. In this context, Puthoff's (1999) account of objects as having informational, energetic and matter components is helpful. The three components interact within the same object and between objects.

This way of looking at things entails the setting aside of a common assumption. It is usually supposed that the meaning a percipient attributes to the perceived object terminates when the object is no longer part of the sensory field. If instead we suppose that the act of perception affects the object, other individuals who later come in contact with the object may be influenced by the prior perception. A person's mind would not only be "in" the brain but also "in" the objects the person has handled. (This accommodates the practice of psychometry where past events are seemingly apprehended when the person is in proximity to an object that was part of the events.)

In studies of PK where the subjects' task was to affect random physical processes, Jahn and his associates (Jahn et. al, 1997) found that subjects who were far removed from the machines were as successful as when they were in the room with the machines. Similar findings have been reported by others. What seemed important was not physical proximity but affective meaning. The successful subjects spoke of "...a sense of 'resonance' or 'bond' with the machine;...of 'falling in love' with it; of 'having fun' with it." The meaning of an object is *felt* while its four-dimensional aspect is sensed. Meanings span space and time and may show no attenuation with distance.

To provide for meaning in the map of space-time, we may add a psychological or consciousness dimension to the four physical dimensions. A meaning dimension should not be regarded as a dimension in the physical or mathematical sense but as complementary to the physical dimensions. In this context, the proposal by Jahn and Dunne (1997) to base a "science of the subjective" on the complementarity principle is helpful. They quote Niels Bohr (1961), "...in associating the physical and the psychical aspects of existence, we are concerned with the special relationship with complementarity which it is not possible throughly to understand by one-sided application either of physical or psychological laws...The real problem is: how can that part of reality that begins with consciousness be combined with those parts that are treated in physics and chemistry? Here we obviously have a genuine case of complementarity." (pp.220-221)

## RSPK Energy

There is little mystery about RSPK energy as such, it is usually a manifestation of kinetic energy as in object-movements and percussive sounds. The problem concerns the type of energy that can generate

kinetic energy without tangible contact. To explore this issue I shall deal separately with the agent, the object-movements, and the environment where the movements occur.

*The Agent:*
Bender (1974) quoted two physicists who took part in the Rosenheim study as saying that the phenomena may have resulted from "non-periodic, short duration forces." (p.134). The agent, Bender noted, "... displayed hysterical contractions in her arms and legs." (p.134). If the contractions were associated with involuntary bursts of electric discharges in the brain, the young woman shared this feature with a large number of RSPK agents (Roll & Persinger, 1998). RSPK in some ways resemble what is called complex partial seizures (CPS). Both involve involuntary, recurrent and brief displays of energy; they both peak in the early teens and affect equal proportions of males and females. RSPK as well as CPS express emotions particularly anger, and onset is sometimes associated with illness, prolonged psychological tension and with increased geomagnetic activity (Persinger, 1996). I have shown these and other similarities in Table 1.

TABLE 1
COMPARISON BETWEEN COMPLEX PARTIAL SEIZURES (CPS) AND
RECURRENT SPONTANEOUS PSYCHOKINESIS (RSPK)

| CPS | RSPK |
|---|---|
| Involuntary body movements | Spontaneous object movements |
| Forced thinking | Object and area focusing |
| Epileptic aura | Apparitions |
| Peaks in early teens | Same |
| Involves equal proportions of males and females | Same |
| Occurs spontaneously or in response to arousal | Same |
| Onset associated with illnesses and prolonged tension | Same |
| Onset associated with increased geomagnetic activity | Same |

*The Physical Environment:*
Bender (1969) considered the possibility "... of the agent's *organizing* available energy instead of physically producing it himself." (p.100) This possibility, also brought up by Owen (1964, p.169), has come up with respect to increases in global as well as local electromagnetic energy. At the suggestion of L. Gearhart (Roll & Gearhart, 1974) I compared 30 RSPK cases, where the dates of inception were known, to the geomagnetic values. In 60% the onset was on days above the yearly average and in 40% on days below, a non-significant difference. The correlation improved when we used increases in geomagnetic activity, 73% showing an increase between the days preceding and following the onset of RSPK, but the correlation was still insignificant. Gearhart and Persinger (1986) reported a significant correlation with a sample of 40

FIGURE 1

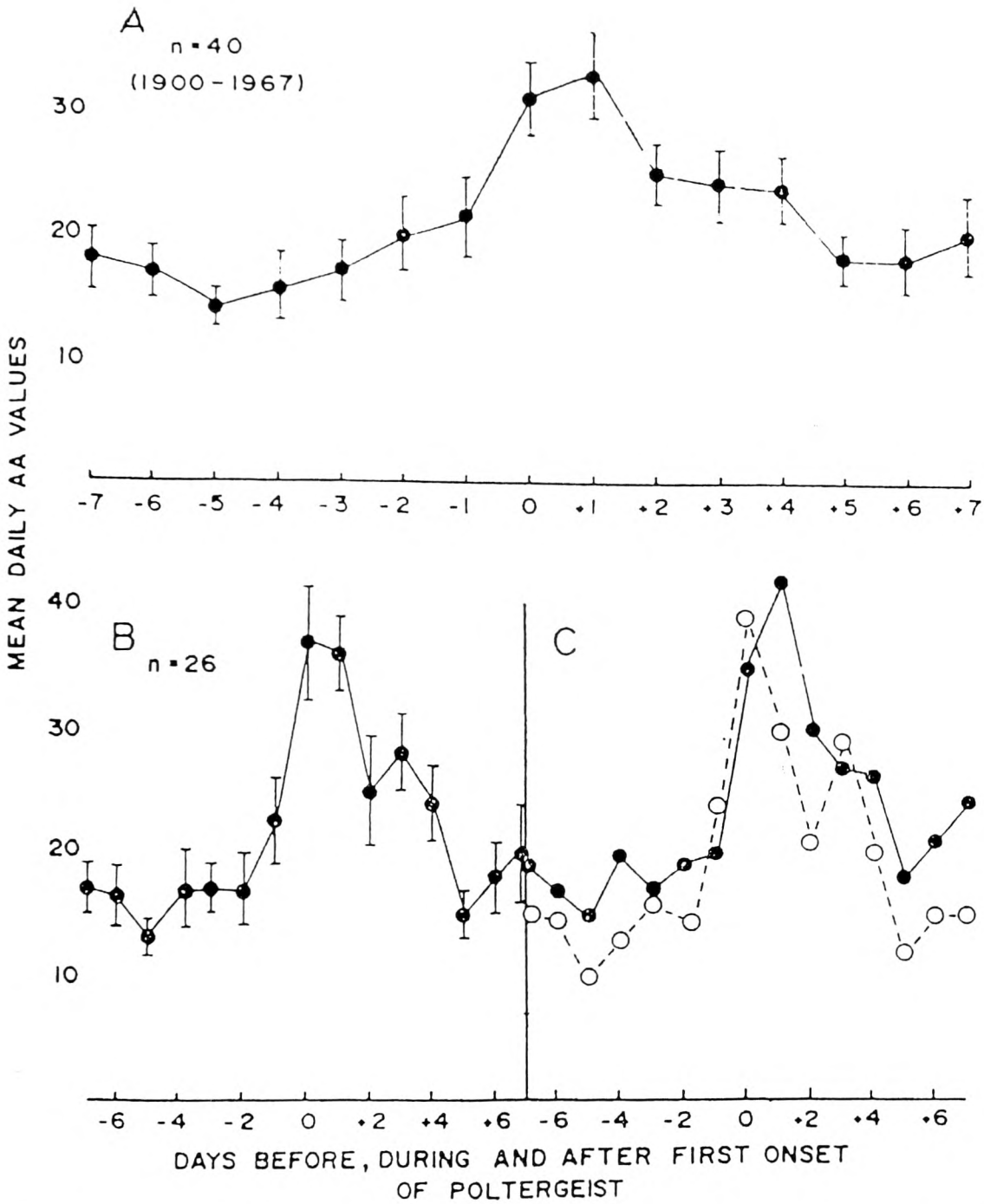


FIG. 1. Means and standard errors of the mean ($\pm 1$) for aa values (a measure of geomagnetic activity) in the northern hemisphere for days before, during, and after the onset of major poltergeist episodes. (A) The temporal pattern for all cases that have been reported that also contained the day of onset. (B) The temporal pattern for those cases that contained the greatest detail and strongest displays, (C) Comparison of episodes that occurred ($n = 13$, open circles) between 1900 and 1944 and those that occurred ($n = 13$, closed circles) between 1945 and 1967.

cases of RSPK (see Figure 1). RSPK is not associated with continuous geomagnetic perturbations. By the fifth day after the inception of RSPK, the geomagnetic values had returned to normal while the RSPK usually continued. On the other hand, geomagnetic disturbances interfere with ESP (Persinger,1989).

Electromagnetic measurements have been made at one RSPK site. In his investigation of a water poltergeist in Florida, Andrew Nichols (Nichols and Roll, 1998) found that the areas where phenomena had been reported showed significantly higher amplitudes than control sites. Nichols attributed the anomaly to high-voltage transmission towers located a quarter of a mile from the house.

Aside from object-movements and percussive sounds, RSPK sometimes includes simple electromagnetic effects, such as flashing lights and interference with electric power. In a case in Clayton, North Carolina, (Roll, 1972, Ch. 6), I observed bursts of white light that were indistinguishable from electronic flashes except that their source seemed to be a 19-year-old woman. For other electromagnetic aspects of RSPK, see Roll and Persinger (1998).

*The Social Environment:*

RSPK occurrences rarely reflect the primary biological needs of the agent. The events seem mostly to concern the agent's relationship with significant others. RSPK is mainly about interpersonal relationships. Two observer effects that have been noted in the Miami, Spring Creek and other studies are relevant. While there were several incidents when the investigators were watching the agent, a direct gaze on the object appeared to inhibit movement. There seemed to be a non-verbal message from the agent: "If you pay attention to the object and not to me, nothing will happen; if you pay attention to me and not to the object, you will be rewarded with an object-movement." Attention to the object is meaningless from the agent's perspective, only attention to the agent is meaningful. The situation is not restricted to macro-PK: if you focus on the physical characteristics of an object, its meaning may recede, if you focus on the meaning, its sensory aspects may be obscured (a nice example of complementarity).

*The Object-Movements:*

PK studies where the subjects attempt to influence on-going random processes are referred to as tests for "micro-PK." RSPK, on the other hand, is a form of "macro-PK" because human-scale, stationary objects are affected. For such objects, Jahn and Dunne (1987) note, "classical continuum behavior obtains." (p.263) That is, loss of energy is expected with increased distance from the source rather than the non-locality of micro-PK where distance may play no role. The decline with distance can take two forms, the inverse square or exponential decay function. When light is dispersed in empty space, or space that is nearly empty, the attenuation follows the inverse square pattern. But when a significant amount of the energy is converted to another form, this results in exponential decay. For instance, when light penetrates water, it is subject to exponential decay because the light is converted to heat, a form of kinetic energy. Energy that passes through an obstacle shows a sharper decline than energy in empty space.

Since the Seaford case (Roll, 1968) I have made a practice of measuring the distances between the agent and the places where the objects stood before they moved. The object-movements in Seaford and in all subsequent cases showed a statistically significant decline, which with one exception (Roll, 1970) matched the exponential pattern better than the inverse pattern. In the first three cases (Roll, 1968, 1969, 1970) I was concerned that the decline effect might not be real since the objects that were in close proximity to the agent might have been thrown normally. But in the Miami, Olive Hill and Columbus cases, where the analysis was focused on witnessed events, there was still clear evidence of a decline and of the exponential pattern (Artley & Roll, 1971; Roll, Burdick & Joines, 1973, 1974; Joines, personal communication, 1999).

The exponential function suggested that the kinetic energy of RSPK was due to the conversion of another energy but the data did not show what type of energy this might be. The objects that were affected seemed to be chosen more for their psychological significance than for their physical characteristics, for instance objects that were electric conductors, such as eating implements, were not favored over glass and porcelain, which are primarily dielectrics.

When we analyzed the direction of movements in relation to the agent (Roll, Burdick & Joines, 1973, 1974), for instance whether the objects went clockwise or counterclockwise, or whether they moved towards the agent or away, the data from the Miami and Olive Hill cases suggested a rotating beam of energy with a dual source of energy, perhaps associated with the two hemispheres of the brain. The pattern seemed consistent with the CPS finding and also with some of the peculiarities of object-movements. But when we analyzed the Columbus data for this effect, there was no evidence at all for the rotating beam pattern (Roll, 1999).

In Miami we were able to set up tests for macro-PK because the occurrences were concentrated in certain areas within the warehouse. This pattern, known as area focusing has been seen in other cases as well. It is a significant aid in setting up tests for macro-PK and may thrown light on the process. A PK test by Graham and Anita Watkins (1974) is relevant. Their subject, Felicia Parise, was able to deflect a compass needle by 15 degrees off north. The interesting thing is that the needle stayed deflected for about 25 minutes after Parise had left the area. During this period, the compass did not respond to a bar magnet, as it should if it were held in place by an electromagnetic source. The needle only reverted to north when the compass was removed from the site. The Watkins referred to this phenomenon as a "linger" effect.

A single study has been made of the electromagnetic characteristics of a region where an RSPK object had landed. Using a common radio receiver, William Joines (1975) detected a frequency of 146 megahertz (Mhz) which persisted for about one minute. Joines suggested that a charge of this type could provide a basis for area focusing and the linger effect. In a different context, a 145 Mhz activity was detected at the site to which Keith Harary attempted to project himself during an OBE (Morris et al., 1978). The anomaly lasted almost exactly the duration of the OBE. On four occasions there was an increase in already-present Mhz activity during experimental versus control periods, twice at 160-165 Mhz and twice at 190 Mhz (in one trial there was no Mhz activity during either period).

There is direct and indirect evidence that electromagnetic energy plays a role in RSPK, but the selection of objects follows psychological rather than physical rules. The electromagnetic force known to science does not have the psychological qualities seen in RSPK. Joines (1975) has suggested that RSPK is due to psi energy which, like known forms, is transmitted in waves. This would account for the exponential decline and for area focusing, since all known waves can be focused within an area. Because psi waves represent a new form of energy, there is no equipment to measure them directly, but they may cause an accompanying electromagnetic wave that can be measured. The postulate of a psychological form of energy to account for RSPK is consistent with the idea that the occurrences take place in psychological space-time.

## DISCUSSION

Bender (1974) proposed that "Poltergeist cases should always be analyzed in terms of a 'field theory': the interaction between the focus person and the social situation in which the poltergeist phenomena show up has to be carefully studied with a view to an understanding of the motivation underlying PK phenomena." (p.130). This field is both psychological and physical and it includes investigators and other outside observers and not only the social setting where the movements of objects were first observed.

A major problem for any theory of RSPK is how objects levitate. Referring to Tizane's (1951) survey of cases investigated by the French police, Bender (1974) noted that objects sometimes seem to be skillfully displaced and may even follow the contours of furniture. At Spring Creek some of the objects evidently followed the layout of the laboratory.

E. H. Brandt (1989) of the Max-Planck-Institut in Stuttgart, mentioned levitations "...claimed to have been caused by supernatural mental forces." He noted that floatation in space of solid and even liquid matter is not unknown in physics. Charged particles levitate in alternating electric fields, conductors may float in strong radio-frequency fields, and superconductors may hover above magnets. Objects can also be made to levitate by jets of gas, intense sound waves, and beams of laser light . The problem with extensive displacements, Brandt points out, is stability. If a levitated body is not to slip when displaced from its equilibrium position, there must be horizontal and vertical restoring forces. There seems to be no provision in physical theories for the lengthy and complex movements of objects sometimes seen in RSPK.

Some object-movements are reminiscent of the way things float about in the zero gravity of space stations. If we suppose that transient suspensions of the earth's gravitational field somehow occurs in proximity to the RSPK agent, it becomes easier to suppose that psi waves from the agent may propel the objects and cause percussive sounds, assuming the psi waves give rise to transient electromagnetic or sonic forces.

The theoretical framework for RSPK I have outlined here with the help of Hans Bender and others has helped me to understand these curious phenomena. I cannot claim that the theory has resulted in any testable hypotheses. We can make predictions about RSPK, which are consistent with the theory, but they are due to empirical observation (for a summary, see Roll and Persinger, 1998). For instance, we may expect outbreaks of RSPK around individuals who:

- Are at the age of puberty or adolescence;
- Are of either sex;
- Show symptoms of CPS (complex partial seizure);
- Exhibit brain-stem anomalies;
- Have been subjected to prolonged psycho-social stress;

RSPK object-movements will:

- Show exponential decline with increased distance from the agent.
- Repeatedly involve the same object or type of object irrespective of distance from the agent (object focusing).
- Repeatedly occur in the same area irrespective of distance from the agent (area focusing).
- Involve objects and areas that are emotionally significant in terms of the agent's social relationships;
- Last less than three months.

- Originate at times of increased global geomagnetic disturbances.

In tests for macro-PK:

- Visual observation of an objects will interfere with its movement.
- Attention to the agent, including visual observation, will facilitate the movement of objects.

It is important to note that the energy that underlie RSPK may be of practical benefit. The study of Tina Resch at Spring Creek Institute in part was an exploration of the potential of RSPK to facilitate healing. Two other studies concerning RSPK and healing are summarized in the Appendix.

I end with a quotation from Jahn and Dunne (1997). "Consciousness," they say, "...defines itself only in its interactions with its physical surround. Conversely, just as physical detectors respond only to external stimuli, the 'objective' properties of the universe are, without exception, only defined by some inquiring, ordering consciousness. This recognition, in turn, opens the door to admittance of the most powerful, but most difficult to represent, family of subjective parameters, those of the teleological genre that comprise conscious (and very possibly unconscious) intention, desire, will, need, or purpose. These are demonstrably primary correlates of empirical consciousness-related anomalies of all ranks, from laboratory-based microscopic human/machine effects, to macroscopic poltergeist phenomena, to creativity of all forms."

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## APPENDIX

### RSPK AND MENTAL HEALING

*Syracuse, New York:*
Ms. Barbara Scales, a registered nurse, described a history of precognitive and apparitional experiences, and reported RSPK movements of small objects and electrical disturbances in her vicinity. She has practiced non-contact healing with her patients; at such times she has feelings of "energy" in her solar plexus. She believed this was the same energy involved in the RSPK. She volunteered to participate in a pilot study June 5-7, 1999 with Drs. Andrew Nichols and William Roll. During two healing sessions, EEG (left occipital), electromyographic (EMG), and electrodermal (EDR) recordings (from solar-plexus and finger) were made. During the first session, her EEG changed from predominant beta to alpha interspersed with theta. At the same time, the EMG showed a gradual increase in electrical amplitude in the solar-plexus of 64 to110 millivolts and an abrupt discharge of 102 millivolts from the finger electrode. During the second session, the EDR varied from 125 to 400 millivolts with a single discharge of 127 and no corresponding EMG changes. The results from the first session seemed to suggest that voltage built up in the solar plexus and was discharged through the hand.

Attempts to detect energy emissions from her body at night with a digital camera and a 35mm conventional camera (both with flash) showed no anomalies.

A friend of Ms. Scales, who also practices non-contact healing, claimed to be able to recharge dead batteries. We brought her two dead AA batteries both of which she partially restored by holding them in her hand for a few minutes.

*Madison, Indiana:*
In addition to haunt occurrences described elsewhere (Roll & Nichols, 2000) the family reported occasional RSPK in proximity to Ms. Johnson. An intense electromagnetic field of 126-157 milligauss and an overlapping geomagnetic field of 725-847 mG were recorded in the home and may have contributed to the haunt and RSPK incidents.

William Roll had encouraged Ms. Johnson to direct her apparent PK abilities to mental healing, and she equipped a room in the house for this purpose. During a pilot study by Drs. Andrew Nichols and Roll, June 28-30, 1999, EEG (left occipital), EDR (finger) and EMG (solar plexus) measurements were taken during healing and rest periods. In order to determine if the healing attempt was associated with changes in the electromagnetic field in the room, this was also recorded. During healing, her EEG changed from predominant beta to alpha with a theta component. There were increases in the EDR (76 to 97 millivolts) and in the EMG (80-127 millivolts), and an increase in the ambient EMF (126 to133 mG).

# PHOTOGRAPHIC AND VIDEO RECORDING OF 'GHOST LIGHTS' AT TWO REPUTEDLY HAUNTED HOUSES

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## ABSTRACT

After interviews with witnesses, Nichols and Roll spent three days at McRaven House, Vicksburg Mississippi, and two visits (two days per visit) totaling four days at the Aponasewicz house, California Pennsylvania. Instrumental recordings were taken at sites where witnesses had experienced haunting-type phenomena. Control recordings were taken in other parts of the houses and grounds. The equipment and method utilized was similar to those employed in previous investigations (Roll and Nichols, 1999, and Nichols and Roll, 1999).

At McRaven House, Roll and Nichols found an elevated geomagnetic field (GMF), the epicenter of which appears to be located beneath the house itself, and which decreases with distance in all directions from the house. The unusual magnetic properties of the site had also affected the bricks of which the house and surrounding structures were constructed. These bricks, made by slaves prior to the Civil War, appeared (due to their exceedingly red coloration) to contain significant amounts of ferrous salts. This property rendered the bricks particularly susceptible to magnetization from the apparent geomagnetic anomaly at the site. Individual bricks were found to possess significant magnetic properties, and the axis of these magnetic fields varied depending upon the orientation of the individual bricks relative to the earth beneath the house.

Photographic tests conducted at the site produced numerous photographic anomalies, consisting of bubble-like translucent orbs which appeared on the digital photographs in copious numbers. Photographs upon which these orbs appeared were taken at times which coincided with unusual magnetic field fluctuations and abrupt increases in atmospheric ion concentrations.

A second investigation was conducted at a small wooden house in California, Pennsylvania. Known as the Aponasewicz house, it was formerly the home of Laura DuBois and her husband John, and Edward Henderson (Laura's father)*. During their two years of occupancy in the house, the DuBois family reported unexplained footsteps, human voices, a sense of presence, apparitions, and in the basement floating orbs of light. The phenomena was attributed to a deceased couple who had occupied the home for many years and were surrogate parents to Mrs. Dubois.

We learned of the case from Dr. Rene Horath, professor of Industrial Engineering at the University of California (Pennsylvania) who had recorded the luminous orbs with a Sony Night Shot video camera. Using the same type of camera, we recorded the orbs, observed them on the video monitor and directly in some instances. They would appear suddenly, move in straight or curved trajectories, slowly or fast. The orbs were usually invisible to the naked eye. On one occasion when Nichols detected an orb nearby, he inserted a temperature probe and found the orb to be 78 degrees Fahrenheit, ten degrees warmer than the room. An electromagnetic probe placed in the path of another orb recorded a field of 120 milligauss (mG).

During two investigative visits, the ambient geomagnetic field in the basement was high at 760-880 mG. The electromagnetic field was unremarkable. The positive ion density was a moderate 2,700 per $cm^3$ and the negative 2,400.

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* Pseudonyms

## INTRODUCTION

A wide variety of perceptual experiences are reported by persons living in houses alleged to be haunted. These include apparitional sightings, unexplained sounds of voices and footsteps, unusual odors and tactile phenomena, as well as object movements and mysterious disappearances and reappearances of household items. Animals at the site frequently are reported to display unusual behavior in certain rooms or at certain times, presumably when the 'ghost' is present. Other commonly reported experiences in haunted locations include the appearance of balls or flashes of light and similar luminous phenomena, as well as frequent electrical effects, such as malfunctioning appliances and batteries draining rapidly. Subjective experiences such as an unexplained feelings of fear or of a sense of 'presence' are frequently reported.

Previous studies by the authors (Nichols and Roll, 1998, Roll and Nichols, 1999, and Nichols and Roll, 1999) suggest that most, if not all reported haunts can be accounted for by an environmental electromagnetic model. As a result of exposure to external EM sources, a person might experience internal dream-type imagery as being external and "real". A minority of cases may require a modification of this hypothesis to include some form of non-corporeal intelligence, either originating from discarnate deceased persons or from the unconscious mind of a living agent.

Scheinle et al, (1997, 1998) concluded that the human organism is more sensitive to weak magnetic fields in the low frequency range than was previously assumed. Experiments with human subjects exposed to similar bioelectromagnetic frequencies in laboratory situations have been reported by Persinger et al, (1990). Persinger (1974) proposed that stimulation of the electrically unstable hippocampus region of the brain by biofrequency geomagnetic or electromagnetic fields can result in the experience of a wide variety of imagery and memory associated perceptions. Persinger's studies also suggested that negative ions in the atmosphere due to thunderstorms or geological sources may lower electrical thresholds in the temporal lobe of the brain, and trigger anomalous perceptions, including apparitional sightings. Thus the 'dark and stormy night' in many fictional ghost stories may have some basis in fact.

## APONASEWICZ HOUSE, CALIFORNIA, PENNSYLVANIA.

The Aponasewicz house in California, Pennsylvania pre-dates the civil war. Although the tiny wood frame building is now vacant, people connected with the property are certain that ghostly inhabitants still possess the property.

In April 1994 Laura and John DuBois and Edward Henderson (Mrs. DuBois' father) moved into the house and occupied it for approximately two years. During this time, Laura saw full-body apparitions of Mary Aponasewicz, the deceased former occupant of the house.

Laura had known Mary as a child and Mary had served as a surrogate parent for her. Although they were not related, Laura called Mary "Mom." When she lived in the house, Laura would often see Mary's form coming down the basement stairs when she did laundry there. At first, these apparitional sightings startled her, but as they occurred more frequently, she would just say "Hi, Mom," and go back to her washing. Laura explains, "When she was alive, I used to help her with her laundry, so it just seems natural that she would continue after death." On one occasion, Laura saw Mary in the kitchen, sitting at the table which had occupied the spot when Mary was alive. Then both Mary and table disappeared.

Laura's husband John saw the ghost of Mary's husband, "Pop" Aponasewicz sitting on the sofa one evening when he was walking into the kitchen. "At first I thought it was one of my boys, but then I realized it was an old man wearing a stove pipe hat." When he looked again, the figure had vanished. When John described the figure to his wife (he had not known the Aponasewicz family), she was amazed. It was an

exact description of the "Pop" Aponasewicz. Neither Laura nor her father had ever described Pop to her husband.

The DuBois family also reported unexplained footsteps, human voices, a sense of presence, and in the basement floating orbs of light.

Sometimes these luminous orbs are visible to the naked eye, and on other occasions they are invisible, but Laura can sense their presence. Laura says that when the orbs are around her, she feels a tightness in her stomach and a tingling sensation in her neck. Laura's father, Edward Henderson, believes the orbs become more active when he and his daughter talk about members of the Aponasewicz family, whom both Laura and Edward had known for two generations. Edward felt a particular closeness with Betty, a daughter of the Aponasewicz's, who contracted a brain tumor when she was 17 and died in the house.

Tragedy is connected with the house, including three accidental deaths on the property. "Pop" Aponasewicz was killed in the back yard while cutting the grass when his riding lawnmower threw him and the mower blades sliced into his head. In another incident, a woman allegedly died in front of the house in 1972 after her car collided with two trucks on the road. She was thrown through her windshield, her head and body landing separately in the yard by the house. The woman was fleeing from a mental hospital to which her family was in the process of committing her. The story made front page headlines in both local newspapers.

The house is currently unoccupied and has been on the market for two years (since September, 1997) and is slated for demolition in the coming months. Edward Henderson is concerned about the spirits of the people he feels still inhabit the house: "I think they're going to be disappointed when the house gets torn down." Henderson has invited the spirits to come over to his house when the building is razed.

### McRaven House, Vicksburg, Mississippi

McRaven House is an historic landmark built during three distinct periods from colonial to ante-bellum times. The oldest part of the house was built in 1797 by Andrew Glass, a highwayman who was thought to have committed at least nineteen murders. Ironically, Glass sold the property to Sheriff Stephen Howard, who built an empire style addition to the house in 1836. The house was subsequently purchased by John Bobb, who built the last addition to the house in 1849. Bobb was shot by Union soldiers in the garden of the house (near the present-day location of the front gates) in 1864, during the American Civil War. The house has reputedly been haunted since that time.

During the Civil War, the grounds of McRaven were used for a Confederate campground and field hospital. In the summer of 1863, during the siege of Vicksburg, the front yard of McRaven was the scene of a battle known as the Railroad Redoubt. William Murray bought McRaven in 1882. Two of his daughters, Ella and Annie, lived in the house until 1960. After their deaths, McRaven remained unoccupied until 1985, when the present owner Mr. Leland French bought the house and painstakingly restored it.

## THE GHOSTS OF MCRAVEN

A number of ghosts are popularly believed to haunt McRraven House. The most active phantom is reputed to be the spirit of Mary Elizabeth Howard, the wife of Sheriff John Howard. Mary died of childbirth complications in the house at the age of fourteen. Her apparition has been seen by several witnesses in the upstairs bedroom where she died, and on the front staircase, known as the "Flying Wing" because of its unique design. Usually she is described as wearing a simple brown morning dress, but on at least one occasion she appeared in more formal attire, perhaps in deference to the wedding ceremony which was being held in the house at the time. Mary's ghost is usually blamed for RSPK-type phenomena which occur in the house, most frequently in or near her bedroom, A lamp on a table next to the bed in Mary's room has been seen to move by numerous witnesses, and her wedding shawl is reputed to vibrate and emit heat upon occasion.

Leland French reported an encounter with an apparition which he believes to be the ghost of William Murray. The sighting took place on the same Flying Wing staircase where Mary Elizabeth has been seen. Shortly after purchasing the property, Mr. French was climbing the stairs when he turned to find Murray (whom he recognized from old photographs) ascending the stairs right behind him. The apparition vanished within a few moments.

Numerous sightings of Civil War era soldiers attired in both Union and Confederate uniforms have been reported at McRaven. They are thought to be the spirits of some of the hundreds of men who died in the Railroad Redoubt skirmish and as patients in the field hospital. One such apparition is described as a Union soldier wearing a slouch hat and the uniform of a minor officer. This figure apparently began to appear in 1997, after a Civil War cartridge plate was unearthed in a yard adjacent to McRaven House. The relic is displayed it in the house along with many other Civil War artifacts excavated on the property.

The apparition of the Union soldier was first reported near the front gates of McRaven House. Another witness sighted him near an outdoor privy, nearer the house, and most recently on the front porch, peering in the window. Three Confederate ghosts are also seen at McRaven, usually huddled together in the basement of the house, perhaps to escape the bombardment during the siege. Another resident phantom is that of a young African-American boy who is seen running through the house and out the front door as if on an urgent errand. The boy has also reportedly been seen curled up under the wooden stairs leading up to the 1797 bedroom.

Other spectral phenomena include a golden light which is said to envelop the dining room. This light is attributed to the spirits of Ella and Annie Murray, who lived in the dining room during their final years. Flickering lights and a piano in the parlor which is heard to play by itself are also included in the ghostly repertoire at McRaven.

Fortunately, all of the McRaven House ghosts appear to be innocuous, although occasionally mischievous. None of the tour guides or other witnesses reported malevolent presences.

## HYPOTHESES

On the basis of previous investigations of haunting type phenomena and our interviews with witnesses, we focused our investigation on attempting to test the following hypotheses:

(1) We hypothesized that the houses or properties where anomalous occurrences and photographic/video anomalies were reported could be a source of unusual geomagnetic or electromagnetic energies which might trigger such experiences. Previous

investigations of haunting and poltergeist-type occurrences (Nichols and Roll, 1998, Roll and Nichols, 1999, Nichols and Roll, 1999) had found a positive correlation between RSPK and haunting-type experiences and localized geomagnetic perturbations. (2) We hypothesized that one or more of the primary witnesses to the occurrences would display evidence of temporal lobe lability, fantasy proneness, and/or a history of psychic experiences.

## INVESTIGATION

After the initial interviews, Roll and Nichols took instrumental recordings throughout the House and surrounding grounds. Photographic testing was performed on the nights of May 28 and 29 in the back yard of the house, the location of a mass grave containing the remains of several hundred Civil War soldiers who died at the site.

### *Equipment*

Our equipment consisted of two frequency weighted Tri-Field electromagnetometers, calibrated for 60 Hz, an Extech model IDR-321 geomagnetometer, and an Extech data logger/multi meter with ELF/VLF electromagnetic field probe, a Raytek Raynger self-illuminated non-contact thermometer, a Radio Shack digital hygrothermometer,and an Alphalabs Air Ion Counter. Photographic testing of the premises and grounds was conducted using two Canon 35 mm autofocus cameras and a Sony Mavica digital camera. Additional photographic testing was performed in conjunction with a Radio Shack portable battery operated Xenon strobe light.

### *Psychological Tests*

Psychological Tests were administered to three witnesses at the Aponasewicz house. The tests were the Psi Experiences Questionnaire (Roll and Braun), the Inventory of Childhood Memories and Imaginings (Wilson and Barber), the Roberts CPES Inventory and the Kiersey Sorter.

### *Method*

At various hours of May 28, 29, and June 1, electromagnetic (EMFs) and geomagnetic fields (GMFs), temperature readings, and air ion concentrations were recorded in different parts of the house and surrounding grounds.

## RESULTS

### *Magnetometry.*

Tests of magnetic field strengths at locations where witnesses had reported apparitional sightings or other paranormal-type experiences revealed several areas of unusually high magnetic fields. Mean field strengths at the McRaven house site ranged from 300 to 450 mG on the ground floor (Fig. 2). Although not abnormally high, these fields were unusual since they decreased with increased distance from the main house, suggesting that the house itself was the epicenter of the rather large geomagnetic anomaly. The electromagnetic fields within the house and surrounding areas were consistent with normal background EMF radiation levels of 2-10 Milligauss. At McRaven the reported anomalous experiences were not confined to any particular location within the structure or surrounding grounds. This is consistent with our findings that the entire house and nearby grounds were within a geomagnetic anomaly which could trigger paranormal-type experiences in sensitive individuals, particularly after extended exposure to such fields.

At McRaven the neuropsychological effect of the magnetic fields may have been intensified by the structure's building materials. McRaven is constructed entirely of bricks which contain high concentrations of iron, and are therefore easily magnetized. Magnetic field measurements of individual bricks at McRaven revealed that the bricks were magnetized, and that the magnetic field axis of each brick corresponded to the axis of the geomagnetic field relative to the brick's position. In addition, the highest levels of geomagnetic field strengths at McRaven were found close to the thick outer walls of the house, which were constructed of several layers of these bricks. This suggests that the occupants, visitors and staff of McRaven were living and working in what is essentially a magnetic box on a daily basis.

The effects of the localized GMF on the individual bricks was further demonstrated by removing one of the bricks from the site. Initially the brick emitted a field of 127 Milligauss. After the brick was removed from the McRaven environs, the field gradually decreased over a period of two months, with a final magnetic field strength of 14 Milligauss.

At the Aponasewicz house, the ambient GMF in the basement, where most of the occurrences had been reported, was uniformly high, ranging from 760 -880 Milligauss. GMFs in the upstairs area of the small house were also high at 550-612 mG. The unusual GMFs decreased away from the house. Control measurements taken in the parking lot of a store nearby (apx. 300 ft. from the house) and at the Henderson home about ½ mile from the Aponasewicz house were only slightly elevated, at 523 and 550 mG respectively.

The electromagnetic field within the Aponasewicz house was unremarkable (2-4 mG) with one exception. During the period when the luminous orbs were visible and being videotaped, Nichols was able to obtain an EMF reading directly from one of the orbs by inserting the magnetometer probe into the orb as it drifted by. The EMF reading from the orb itself was 127 mG.

*Psychological Tests.*

At the McRaven house, the witnesses were too numerous for comprehensive individual testing. Since the house is maintained as a museum, many of the experiences are reported by visitors during tours, and were unavailable for interviews or testing. However, Roberts CPES and the ICMI, as well as the Psi Experiences Questionnaire, were administered to three witnesses, Leland French and two tour guides, Jennifer and Stacy (pseudonyms).

Responses to these questionnaires suggest temporal lobe lability in two of the witnesses, Leland French and Stacy. (CPES = 27 (French) CPES = 29 (Stacy) M = 20.4, SD = 14.2) no signs of temporal lobe lability were evident in the questionnaire completed by Jennifer (CPES = 15) who reported only a single apparitional sighting at McRaven. She indicated only two minor psi experiences in her life previously. Interestingly, Jennifer also spent the least time at McRaven, due to her work schedule. Both Stacy and Leland French reported numerous previous psi experiences and both considered themselves to be sensitive to such occurrences. Of the three witnesses, only Stacy's response to the ICMI indicated fantasy proneness (ICMI = 27, M = 19.5, SD = 6.5).

During the Aponasewicz house investigation, questionnaires were administered to three witnesses, Linda and John DuBois, and Edward Henderson. All three witnesses displayed probable temporal lobe lability as indicated by the CPES inventory (Table 1). Both Laura and Edward reported many psi experiences, (John reported only a single apparitional sighting in the Aponasewicz house, and no previous experiences) and Laura's responses to the ICMI indicated strong imaginative tendencies. Her responses to the CPES were suggestive of temporal lobe lability, but were within the normal range. Laura reported

many previous psi experiences, e.g., childhood sightings of apparitions which included religious figures and a giant bird which was a popular motif in local folklore.

TABLE 1
RESPONSES TO QUESTIONNAIRES (PSI, ICMI, CPES)

| Witnesses | PSI | ICMI (M =19.5) | CPES (M = 20.4) |
|---|---|---|---|
| Laura DuBois | 12 | 44 | 31 |
| John DuBois | 1 | 14 | 19 |
| Edward Henderson | 4 | 22 | 26 |

*Photography/Videography.*

At the McRaven house, photographic tests were made using two Canon 35mm auto-focus cameras and a Sony Mavica digital still camera. At the Aponasewicz house, additional testing was performed using a Sony Night Shot video camera as well as the 35mm and digital still cameras.

A particularly interesting aspect of this investigation was due to Ms. Janis Raley, who had previously taken digital still photographs of luminous orbs at McRaven house. Using her digital camera and our disks, we were able to replicate these anomalous photographs. On the nights of May 28 and 29, 172 digital photographs were taken in the back yard of McRaven House. The photos were taken at one minute intervals using two 35mm cameras and a digital still camera in alternating succession.

Two paranormal investigators from Texas who were present during the investigation suggested that we play tapes of Civil War era music during the photography testing since, according to their previous experience at the site, this seemed to stimulate the appearance of the orbs. They also suggested that the use of a strobe light might be effective in enhancing the phenomena. They theorized that the strobes might provide a source of energy for the materialization of the "spirits". During several of the tests, we did employ both the recorded music and the strobe light, although we were careful to ensure that our photographs were taken during the intervals in which the strobe was not flashing, in order to avoid mistaking the lights from the strobe for anomalous phenomena.

A total of 144 35mm flash photographs were taken with two 35 mm cameras, as well as 172 digital still photographs. Of these, 3 35mm photos and 12 digital photos showed anomalous luminosities in the form of bubble-like spherical orbs. In some photographs only one or two orbs are visible, but in 4 of the digital photos literally dozens are seen. These orbs seem to be of various sizes, but this could be due to varying distances from the camera. Two of the photographs show orbs which appear to be partially obscured by intervening vegetation, suggesting that these were three dimensional structures occupying space at a distance from the camera (as opposed to moisture droplets, for example). The orbs were not visible to any of the witnesses present, but could be seen immediately on the LCD viewing screen of the digital camera. It is unclear whether the music recordings or strobe light had any effect on the appearance of the orbs, but several transient bursts of EMF were noted during the photography session.

48 digital still photographs and 32 35mm still photographs were taken under similar conditions as controls (on the same nights, near the McRaven house but outside of the GMF anomaly zone). Orbs were

not visible on any of the control photographs. Since the number of photographic anomalies at McRaven were insufficient for statistical comparison with the controls, these effects cannot be considered significant, but are suggestive and merit further study.

At the Aponasewicz house, Dr. Rene Horath of the Department of Industrial Engineering at the University of California, Pennsylvania had previously recorded videotape footage of floating orbs using an infra-red video system, the Sony Night-Shot camera. In two investigative visits to the house, AN and WR obtained several hours of video footage which displayed identical phenomena, using an identical Sony camera purchased especially for this investigation.

Additional 35mm photographs and digital photographs taken at the site also recorded the luminous orbs. In contrast to the McRaven house phenomena, these orbs were sometimes faintly visible in total darkness to AN and other observers, appearing as luminous bubbles ranging from apx. 1 inch to three inches in diameter. Using two Night-Shot cameras simultaneously, hundreds of these orbs were recorded over several hours during two night visits to the house.

*Objections to the Orb Phenomena.*

There are several potential objections to the appearance of orbs (and other photographic anomalies obtained at reputedly "haunted" sites) which must be addressed. These include:

- (1) The orbs may be due to moisture in the air, or on the lens of the camera, reflecting the flash or, in the case of the infra-red video camera, reflecting the beam of the infra-red illuminator.
- (2) The orbs may be due to defective film, light leaks, or other problems with the camera itself.
- (3) The orbs may be due to dust particles in the air, reflecting the flash or illuminator as described for moisture particles above.

*Response to Objections*

Care was taken to ensure that moisture droplets were not present on the lenses of the cameras used in the photographic testing. Moisture droplets in the air due to high humidity levels cannot be completely ruled out, particularly at the McRaven site, since these tests were conducted during the summer, when humidity levels were high (90%). Control photographs taken during equally humid conditions by AN and WR have not produced a similar photographic anomalies.[2] Additional control photos taken by AN by spraying a fine water mist in front of a camera at night also failed to produce similar photographs.

At the Aponasewicz site, investigations were conducted during fall and winter, when humidity was quite low (11%). Dust particles suspended in the air were considered as a possible source for the floating orbs recorded on videotape. This was discounted for two reasons. (1) Attempts to create the phenomena during times when the actual orbs were not visible on the video LCD monitor were made by repeatedly striking the wooden beams of the basement ceiling in front of the camera lens. This created copious dust which was clearly visible to the eye, but did not register as it drifted in front of the camera. In fact, the dust was completely invisible.

It is highly unlikely that defective cameras or film were the origin of the orbs, since at least five different cameras, including three video cameras (at the Aponasewicz house) had recorded the phenomena. Whatever the source of the orbs, they appeared not only on videotape, but also on 35mm and digital still photographs.

[2] Moisture droplets do occasionally appear in photographs taken outdoors at night, but they are readily identifiable and quite distinct from the anomalous orbs recorded at this site .

At the Aponasewicz house, the orbs were intermittently visible to several witnesses, including AN. This also precludes the possibility that the orbs were due to camera defects, dust, moisture, etc.

## DISCUSSION

Persinger (1974) has suggested that exposure to unusual magnetic fields associated with earthquake faults may induce anomalous experiences. At McRaven the haunting-type experiences may have resulted from exposure to transient geomagnetic variations in the house and environs. Due to the proximity of the New Madrid fault zone, piezoelectric and piezomagnetic effects from a tertiary fault beneath the house may be the source of the unusual geomagnetic fields at this site.

Persinger also predicted that sites proximal to such fault zones would be subject to multiple reportedly haunted locations (citing the New Madrid fault zone as an example). Vicksburg and the surrounding area is indeed such a "Phantom Zone," although the many reputedly haunted structures there are commonly attributed to the violent history of the area.

Several years ago one of the authors (AN) conducted an (unpublished) investigation of a recurrent luminous anomaly in Gurdon, Arkansas, known as the "Gurdon Spook Light". This luminous orb appears almost nightly along a four mile section of railroad tracks in a marshy area. The origin of the light is locally attributed to the ghost of a railroad track maintenance foreman who was murdered near this area in 1945. During this investigation AN was able to visually observe the light, as well as photograph it using ultraviolet-sensitive film. The motion of this luminous orb is always above the railroad tracks, and AN confirmed that its appearance corresponded to increased EMFs and fluctuations in the electrical voltage of the iron tracks, as measured by a voltmeter. No geomagnetometer was available at the time, but it is reasonable to assume that unusual geomagnetic field activity would also have been present. Like McRaven house, The Gurdon Spook light is also located near the New Madrid fault zone.

Investigations by the authors suggest that haunting-type experiences may have an external catalyst; intermittent or constant exposure of percipients to elevated electromagnetic and/or geomagnetic fields, or to transient significant fluctuations in such fields.

Probably the most important aspect of these cases were the luminous spheres, an unidentified atmospheric phenomenon characterized by radiating electromagnetic energy. Two examples of similar phenomena are ball lighting and earth lights, the former occurs frequently, but not exclusively, during thunderstorms and in a highly charged atmosphere, and it has been well documented over the years.

The earth light, however, has only been described since 1982 (Devereux,1989) Devereux has presented compelling evidence that earth lights are produced, like seismic electricity, at fault lines in geological strata. Although the precise geophysical mechanism for their production is still uncertain, it is evident that powerful piezoelectrical effects in subterranean areas of tectonic strain (i.e. triboluminescence) contribute to the production of this phenomenon.

Laboratory experiments (Brady, Rowell & Stroud, 1984) have demonstrated that geophysical strain-induced luminosities can be produced in a predictable manner. They occur a few tenths of a microsecond before cylindrical rock samples are fractured along their major axis by a hydraulic press. The emissions are *not* caused by arc or spark discharges; highly energetic particles (electrons) are emitted, which in turn excite the atoms within the surrounding water vapor or gas.

When measured with fast frame photography, the luminosities are spherical in shape, and have a life of about 1 second. The visible light spectrum of these orbs peaks between 400 and 550 nanometers, and low frequency radio waves (about 2 kHz) and microwave radiation are also generated. Calculations indicate

that the total energy density of the rock (from the applied stress) is equivalent to the energy of the luminous objects (about $10^9$ joules/$cc^2$.) Magnetic field strengths are also estimated to be substantial.

If the laboratory phenomena can be generalized to a larger scale comparable to field conditions at the Aponasewicz and McRaven sites, then a number of perceptual properties might be expected in conjunction with these luminosities. Since the phenomena at these locations would be generated by tectonic strain potentially focused from hundreds of square kilometers, the total energy within such a display would be much larger than those produced in the laboratory. Since the luminous orbs recorded at these sites perceptually appear to be approximately 1 to 20 centimeters in diameter, then their potential life span might be on the order of several minutes. The rotation speed should be considerably slower than laboratory examples, possibly within the 1-10 Hz range (Persinger, 1984). The color of the orbs would depend upon the maximum wavelengths being generated, by the fluorescence potential of local atmospheric gasses, and by the stability of the conditions.

Movement of these orbs would be affected by the rotation of the orb, by local geomagnetic variables, by fluctuations in the main polar-equatorial GMF, and by proximity to artificial or natural electromagnetic sources, including human beings. Persinger (1974) has suggested that such luminosities could be attracted or repelled from human bioelectrical fields. The reaction of the orbs to the proximity of human beings could in turn be affected by their thoughts and emotional state, since these would have a direct effect on the observers electrical skin resistance, and thus on the polarity and strength of their bioelectromagnetic field.

Close proximity to the intense GMF transients which would be necessary to create such displays could induce electric currents within a variety of electronic systems, such as television and light circuits, resulting in interference with television or radio transmissions, power surges, and malfunctioning household appliances.

Direct stimulation of the human brain by current induction within sensitive temporal lobe structures would be expected to evoke profound perceptual, experiential and psychological effects including hallucinatory experiences (Persinger 1983, Nichols & Roll, 1999, Roll & Nichols, 1999). It is likely that both the luminous phenomena and the observer would be influenced by the geomagnetic field, and the descriptions of experiences within the field would be further confounded by superstition and predisposition of belief.

It is evident that anomalous geomagnetic fields are associated with unusual and intense electromagnetic events. If the hypothesis is correct, then people with histories of repeated exposures to these phenomena should develop signs of temporal lobe changes (Fedio & Martin, 1983) Although there are other psychoneurological factors which might predispose percipients to these behavioral changes, this risk should be more thoroughly evaluated.

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# TWO STUDIES OF APPARITIONAL SENSITIVITY AMONGST NOVICE AND EXPERIENCED PERCIPIENTS[1]

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## ABSTRACT

Unusual paranormally associated experiences have been reported by guests as well as the owner and management personnel of the historic Oliver House in Bisbee, Arizona. Occupants and former owners believed that a variety of ghosts inhabit the building. In order to investigate the haunting phenomena, the management prepared a sectioned floor plan of the house indicating noticeably "haunted" locations and listed a variety of personality trait characteristic adjectives from Gough's Adjective Checklist to describe each ghost. A professional psychic and nineteen student sensitives were instructed to mark copies of the floor plan for locations they considered haunted and score the checklist as they toured the house. Only the professional psychic and one student novice (both $p<.05$) scored a significant correspondence in the floorplan impressions. Unfortunately, adjective checklist data was not considered sufficient for comparison, due to a lack of participation compliance amongst the student team. Overnight journal reports of student participants recorded episodes suggestive of lucid dreaming and out-of-body experiences.

Nearly seven years following the original Oliver House investigation in 1992, a comparative investigation was conducted at a similar Bed and Breakfast in Tucson, Arizona. Selected experienced students from previous parapsychology classes and subsequent investigations (n=11) were paired with a group of first time student investigators (n=7). The significance of investigation experience was confirmed by a Mann-Whitney test of the Fisher "p" values from both groups. Overnight journal reports of student participants were again recorded. However episodes of lucid dreaming and out-of-body experiences, characteristic of the Oliver House investigation were not present. One dreamer, did however produce a sketch of a dream individual that appeared to bear a strong resemblance to the original owner and resident ghost of the house.

## INTRODUCTION

In response to numerous requests from graduates of my parapsychology and intuition classes at Pima Community College in Tucson, in mid October 1992 I organized a group of "high interest" students to serve as "sensitives" for an investigation team in an attempt to determine the validity of haunting claims at the Oliver House Bed and Breakfast in Bisbee, Arizona utilizing the quantitative methodology of Gertrude Schmeidler. In total, the investigation team consisted of nineteen "student sensitives" and a professional psychic. Although the exercise was primarily intended as a field-research project for my parapsychology students, as a replication attempt, I assumed a hypothesis that the psychic would successfully locate and identify haunting presences comparable to that of the management control. Since the house had established such a renown reputation within the community, I followed a normal academic percentage expectation and also anticipated that at least one third of the student investigators would have successful results. Only the professional psychic and one student novice (both $p<.05$) scored a significant correspondence utilizing the Fisher Exact Method. While the significance of the professional psychic may be expected, the results of the single significant novice became the focus of a later comparative study.

[1] The author would like to thank Jerry Solfvin, PhD. for his technical assistance.

Considering that the participants in the investigation were introductory parapsychology students with no prior investigation experience, one begins to understand the level of excitement in anticipation of the investigation process. It seems likely therefore, that the conservative approach of the significant novice may have proven to her favor in comparison to the highly excited students who were anxious to indicate any unusual sensations and perceptions. Nearly seven years later, a follow-up study was conducted utilizing groups of continuous and novice students. Implementing the same Schmeidler floor plan assessment that was in effect at the Oliver House, both groups participated in a walk-through investigation of a Bed and Breakfast facility that was said to be "haunted". My functional hypothesis for this study was to assert that experienced student investigators should reflect more successful results.

Since both investigation sites were bed and breakfast facilities, we had the unique advantage of being able to stay overnight on each occasion. Although recorded accountability of haunting influence into dream content is rare, it was noted by Mishlove (1975) as an inclusion in *The Roots of Consciousness*. Describing the phenomena, Mishlove refers to an article in the March 19, 1974 issue of the Berkeley *Gazette,* headlined "A Haunting at the Faculty Club". In summation, the article related the story of Dr. Tokuda, a visiting Japanese scholar who told of a "very gentlemanly" looking Caucasian man sitting on a chair and peering at him, while he was in a half-somnolent state in his room at the Faculty Club on the University of California campus. Later when the professor told club personnel about his experience, they confirmed that the room had been formerly occupied for 36 years by a university professor who had died two years and a week earlier. Consequently, I was curious to monitor the overnight room experiences of the student sensitives and requested that each individual maintain a journal record of any other relevant incidents.

## Study Number One

### A Systematic Replication of Schmeidler's Quantitative Methodology of Haunted House Investigations and Dream State Visitations in Historic Bisbee, Arizona

*Background*

Dennis Schranz bought into a piece of the wild west in 1986, when he purchased the historic Oliver House in Bisbee, Arizona. Originally built in 1909 by Edith Ann Oliver, wife of mining tycoon Henry Oliver, the facility was designed as a boarding house and planning center for executive members of the Arizona and Calumet Mining Company. Believing it to be the perfect old house for restoration as a bed and breakfast, he negotiated with its previous owners and was nearly completed with the transactions when one of the owners jumped up and confessed that she couldn't go through with the deal "in good conscience".

"The place is haunted," she confessed. "There are five ghosts in the house, one of them violent."

Since Schranz didn't really believe in ghosts at the time, he said that wouldn't worry him and they concluded the sales transaction. Later however, as he settled down to spend his first night alone in the house, he began to hear water running through pipes that no longer existed. This alone would have been a strange enough occurrence, since he was supposed to be the only occupant. However, when the water sound stopped, footsteps were heard walking down the hallway. As he listened to them approaching his room, he was glad he had locked the door. The action proved futile however, as the steps continued into his room and up to his bed.

This event was only an initiation for Schranz and others who have stayed in the facility since. Although no identities for the non-living inhabitants of the house have been established, several killings were said to have taken place during the hotel's earlier days. One murder in particular, involved a mining company employee named Nat Anderson -- who was shot at the top of the staircase to the second floor on February 22, 1920. According to the "Bisbee Daily Review," Anderson was shot in the head and back during the early morning hours as he was entering room #13. Unfortunately, his assailant was never captured and the whole incident remains an unsolved mystery to this day.

Another incident -- unconfirmed by public record -- relates the story of a man who in 1932 allegedly found his wife in bed with another man in what is now the Blue Room. Enraged by his discovery, he shot them both and then killed himself after going on a shooting spree throughout the first floor of the building.

Terri King, former manager of the facility, reported experiencing a presence in both the Blue Room and room #13, as well as in several other locations throughout the house. One incident in particular occurred when she went into the Captain's Room to change the bed sheets. Upon entering the room, she sensed a hostile presence and then heard a voice yell "get out!" Since she was the only person present in the room, she challenged the formless voice and replied in an equally authoritarian voice, "What do you mean 'Get Out'? Who else is going to clean up this room? You get out!" Evidently it did. She never heard the voice again.

Another incident involved the Grandma Room. In this room, various guests have reported what appeared to be an older woman watching over them during the night. Although the sighting had made the guests reportedly nervous, it was felt to be a benevolent spirit that was offering its presence as a protection.

*Method*

The method used in this study was adapted from Schmeidler (1966). Schmeidler developed a quantitative methodology for evaluating reports of hauntings by having psychic sensitives do independent, blind, walk-throughs of the reportedly haunted area or building. They were asked to identify specific locations where they psychically "felt" the haunting focused. The reports of the sensitives are then matched up with the property owner's report of the locations of specific events or activity to determine whether there is a statistical correspondence.

Schmeidler (1966) and Schmeidler and Maher (1975) had only a standard walk-through in their studies. Since they were in private residence situations, they prevented overnight stays. Since the facility in the current study is a bed and breakfast inn, we had the unique advantage of being able to stay overnight in the house after the walk-throughs were completed, in order to gather additional qualitative data. Special accommodations were made that included overnight lodging and three meals.

*Subjects*

The subjects, or "sensitives," for this study included one professional psychic (Shirley), and 19 introductory parapsychology students from the author's course at Pima Community College in Tucson, Arizona. The professional psychic was Shirley Nelson, a local clairvoyant from Tucson, Arizona who considered herself to have been recognized as "gifted" since the age of 6 although she'd been practicing professionally for the past 16 years. Her specialties included consultation assistance in business and the legal, medical, and law enforcement professions, as well as a considerable amount of experience in what she referred to as "ghostbusting".

The students included 5 males and 14 females, age range 18 to 45, who were all students in the current author's introductory parapsychology course at Pima Community College in Tucson, Arizona. According to

Auerbach's Psychic Experiences, Dreaming, and Beliefs Survey (discussed below), twelve (63%) of the nineteen students were classified as "experienced" with a variety of psi and dream phenomena, and eleven of these were "believers" (in psi phenomena) while one was undecided. For the remaining seven students with limited experience with psi and dream phenomena, four of them were believers and three were undecided. There were no skeptics or nonbelievers among the students.

*Instruments*

The instruments used in this study were:

*The Auerbach Psychic Experiences, Dreaming, and Beliefs Survey.*
This is a condensed version of assessments developed by Loyd Auerbach (Auerbach, 1986; 1991). This questionnaire consists of three major parts. The first part addresses various aspects of one's ESP and PK experiences from the simple perception of extra-sensory information to the witness of psychokinetic effects. Part two reviews the individual's dream experiences, from recall capability to lucidity and precognition. The final part assesses the individual's level of belief on a variety of paranormal topics from psychokinetics to telepathy, precognition, and reincarnation. Responses on parts one and two are either "yes" (=1) or "no" (=2). An average score of 1.0 to 1.5 is considered a "high" experience level, while an average score above 1.5 is considered a "low" experience level. On the belief section, with each item assessed on a 5-point scale, an average score of 1.0 to 2.5 is classified as a believer, 2.5 to 3.5 as undecided, and over 3.5 as a skeptic.

*A Scale Diagram of the House*
(See Diagram #1). A detailed sketch of both floors of the building was created by Terri King, resident Manager of the Oliver House. Photocopies were then produced in sufficient quantities for the investigation exercise. Terri retained the master following copy reproduction and placed an X in each location where she had felt a ghost presence. Unmarked copies of the original diagram were later given to participants for their walk-through. Participants were asked to mark the diagram to indicate any areas where they detected or "sensed" a ghost. Multiple ghosts per room were identified by subscripts (ie: $X_1$, $X_2$, etc.).

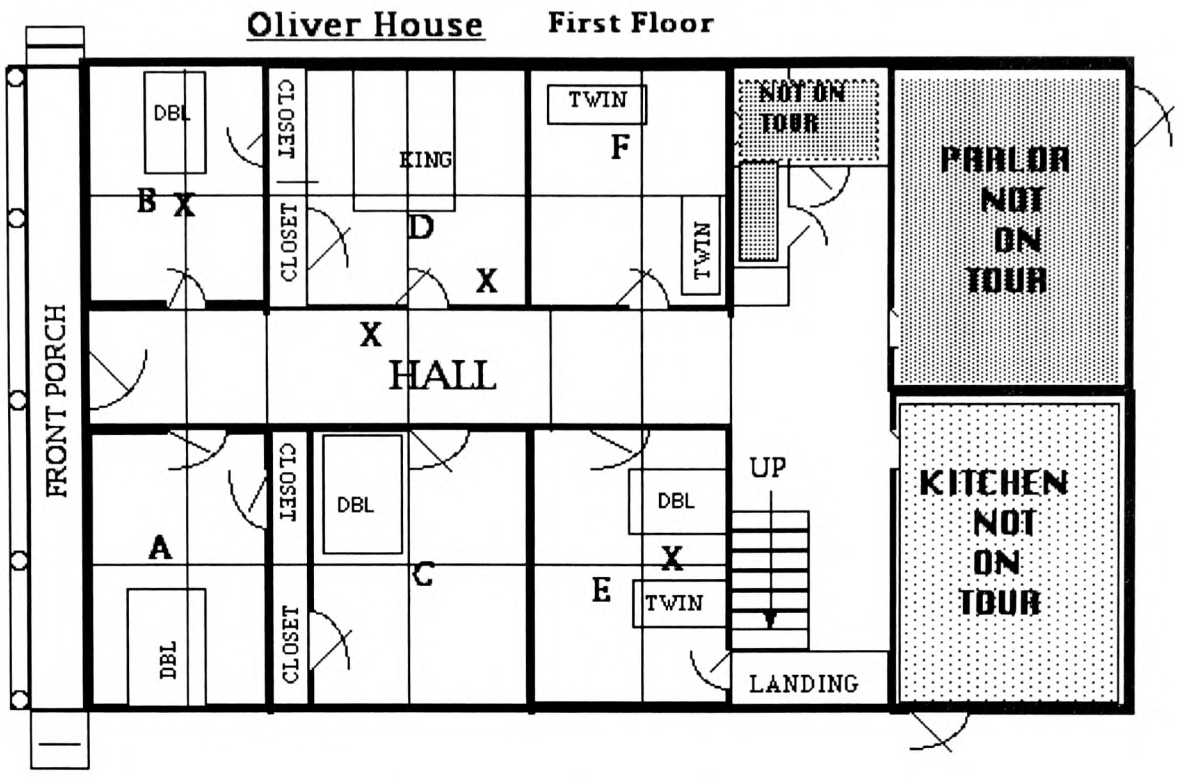
*A revised version of Gough's Adjective Check List*
In order to capture an accurate impression of the ghost's personality, Schmeidler felt the original Gough Adjective Checklist was far too long for the type of research she was doing (Schmeidler, 1966). Consequently, she developed a condensed version that omitted irrelevant adjectives, suggested circling and crossouts for characteristic emphasis, and requested the age and sex of the ghost. Since the Oliver House was thought to have multiple ghosts, I utilized the revised adjective list only, removing the requirement for age and sex discrimination. In the event that there were multiple ghosts reported, the subject was requested to identify the adjective description by the associated room letter. If there was more than one ghost per room, a subscript would be added to the identifying room letter (ie: $A_1$, $B_3$, $G_2$, etc.).

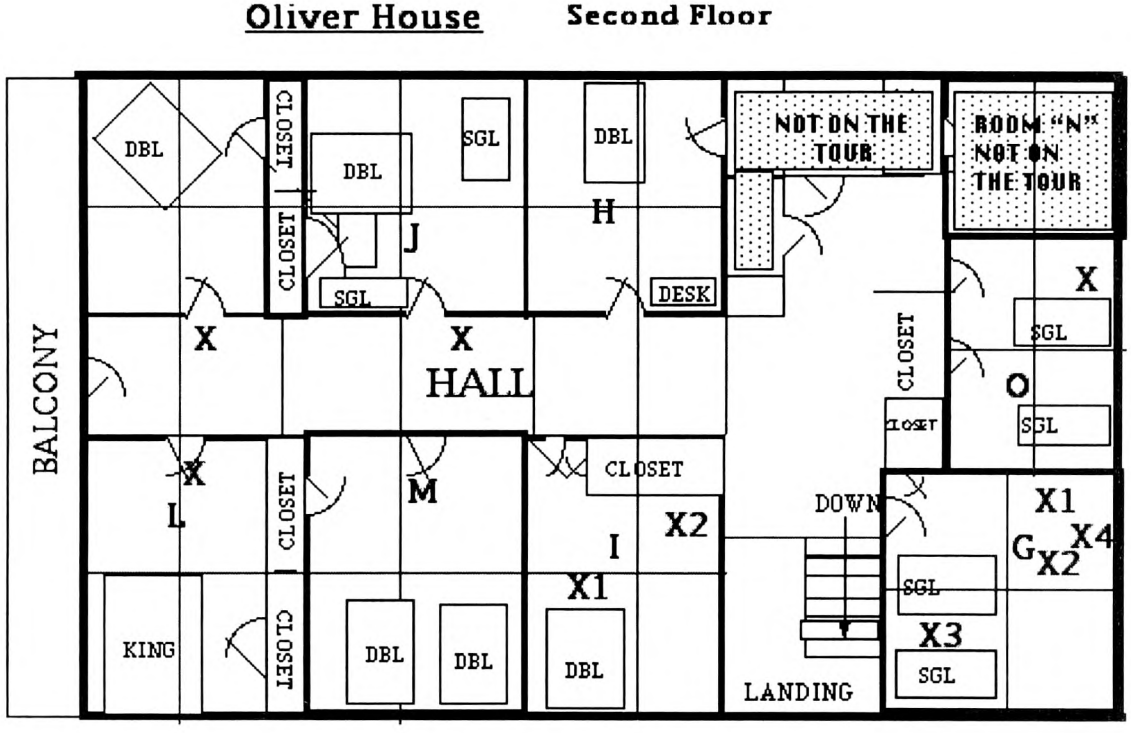
*Procedure*

On the eve of our investigation, participants had time to relax, meet the manager, and have dinner as a group, but there was a strict rule against any discussions of the reported haunting in this house. Any unique artifacts or room dressings that were thought to possibly provide any clues to the history of the room or house was previously removed by the management preceding our arrival. Immediately after dinner, I established two baseline levels of information. The first information source was provided by walking the professional psychic through the house and recording her impressions as we traveled from room to

**DIAGRAM 1**

**FLOOR PLAN OF THE OLIVER HOUSE SHOWING HAUNTING SITES ACCORDING TO MANAGEMENT**



room. At the same time, I had each student participant complete a variation of the "Auerbach Psychic Dreaming-Psychic Experiences--Psychic Beliefs Survey" (1986) (1991) in order to establish a measure of their individual experiences and "sheep/goat" orientation.

Following the psychic's tour, each student participant was given a copy of the house diagram, the adjective list, and an instruction sheet that detailed the associated expectations. Participants were then told that they would be randomly touring the house one room at a time in individual succession. Hall monitors would assure that there was no more than one person per room at one time and limit room occupation to no more than 10 minutes. While in each room, they were told to "get a feeling" for the room and identify any suspected presences with an X in the appropriate location on their floor plan. Recording any similar impressions within the hallway were also encouraged. Since there were 14 rooms for inspection by nineteen individuals, in the interest of perceptual immediacy and a smoother traffic flow, they were also asked to identify the associated personality of the ghost(s) via the adjective checklist as they progressed through the rooms, rather than to risk memory recall of this information after the walk-through. Photographs were encouraged, but not required. Since the rooms were each alphabetically identified, individuals would begin with room A at the front of the first floor and progress down the hallway until they reached the stairs to the second floor. Upon "availability", the floor monitor would permit access to the second floor, where the tour would continue alphabetically. The only areas not designated for use were the commons area of the parlor, the kitchen, and the bathrooms on the first floor; and a private room (Room N) and bathrooms on the second floor. On completion of the second floor, participants were instructed to return to the parlor and were restricted from discussing their impressions until all nineteen participants had completed the tour. Approximately two hours later the walk through was completed.

Upon completion of the walk-through the exchange of student impressions was permitted. Personalized journals were then distributed for the recording of overnight experiences and impressions, and room assignments were announced. Students were asked to record any personal experiences they had in their room during the night. Anyone who felt uncomfortable with their designated room was offered the opportunity to request another. As it was however, no one felt any room changes were necessary.

The wife of the participant assigned to the Grandma Room however, did feel a slight uneasiness. Describing the experience in her journal, she reports:

> "It was an uncomfortable room at first. A heavy fragrance was in the room. I felt something in the left corner by the chair.
>
> "After being assigned the room -- June, Shirley, and Tina all visited the room. Each felt that there was a child there (unhappy, timid, and probably abused).
>
> "Shirley [the professional psychic] felt particularly uncomfortable, so she asked us to join hands and repeat after her - - asking spirit to seek the white light."

This was the only student contact that was made by the professional psychic, since her role was not only for that of data comparison, but also to serve as spiritual counselor, should the need arise. No formal information exchange took place during the contact and the student was comforted enough to remain overnight. House management personnel were sworn to secrecy concerning the history of the house during the entire time of our occupation until the following morning after the conclusion our group feedback and collective discussion session.

*Results*

*A Deviations from the Planned Procedure*

Three student subjects failed to complete the walk-through. Providing reasons from fatigue to boredom and lack of interest, these individuals were dropped from data analysis.

*B Location of Hauntings*

Following the walk-through, I examined the public access areas of the house and then divided them into 69 "traffic controlled" grid segments for the purpose of data analysis. This was primarily established by quartering each of the main front rooms on both floors and then extending the half-room division points into the hallway. The stairway was also considered a segment and each of the back wall accessible rooms were also quartered, I then transferred the management control plan indicating 13 haunted areas (4 on the first floor and 9 on the second) to a transparent grid overlay. As per the Schmeidler methodology (cited earlier), for each sensitive, data were cast into a 2 x 2 table: haunted units vs. non-haunted for the house management vs. sensitive. Associated responses between house management and sensitive reports were evaluated by the Fisher Exact Method.

As seen in Table 1 below, the floor plan responses of the professional psychic ($p=.011$) and one student ($p=.028$) gave responses of significant correspondence to the management's location reports.

*C Personality of the Ghost*

Results of reports concerning the personality of the ghost(s) were inconclusive. Although a full adjective report was prepared by the management, both professional and student sensitives alike were only partially responsive to this task. With a deliberate neglect of the task from the professional psychic and less than half a response (44%) from the students, I dropped this analysis from consideration. Respondents claimed such notations only distracted from their perceptions and were counterproductive in their focus of attention. Midway through the procession most participants switched their attention from the list of adjectives to their own personal responses concerning the atmosphere of each room. Given the level of apathy in response to this task and my resultant concern for data validity, I feel that my decision for the abandonment of this analysis was warranted.

*D Overnight Journals*

Following breakfast the next morning, still unaware of the house's history, various participants reported their overnight experiences. Overnight journal reports of the student participants recorded episodes of what appeared to be lucid dreaming and out-of-body experiences. Lucid dreaming accounts suggested what may have been the presence of former living residents of the house within the dream state. Of the ten journal accounts provided (53%), all were from participants who had stayed on the second floor. Only four of the ten accounts reported no significant events for the evening, with one of them making mention of temperature changes in the room and a feeling of stuffiness, which she attributed to the physical environment.

The six remaining reports (coming from four separate rooms) however, all recorded a seemingly unique syncronicity in their style and content. Common factors included the quality of lucidity, with the awareness of being in a dream state within the confines of their room and in the presence of an individual from a previous time period.

Table 1
FLOOR PLAN RESULTS OF PROFESSIONAL PSYCHIC AND STUDENTS

| Student Management | Haunted | | Not Haunted | | Fisher's *p*-Value |
|---|---|---|---|---|---|
| | Haunted | Not Haunted | Haunted | Not Haunted | |
| PROFESSIONAL PYCHIC | | | | | |
| Shirley | 6 | 8 | 6 | 49 | .011* |
| STUDENT SENSITIVES | | | | | |
| Melissa | 4 | 9 | 8 | 48 | .220 |
| Wayne | 0 | 6 | 12 | 51 | 1.000 |
| Tina | 0 | 4 | 12 | 53 | 1.000 |
| Karen | 0 | 4 | 12 | 53 | 1.000 |
| Bill | 0 | 3 | 12 | 54 | 1.000 |
| Marianne | 0 | 3 | 12 | 54 | 1.000 |
| Yolanda | 1 | 2 | 11 | 55 | .442 |
| June | 2 | 6 | 10 | 51 | .621 |
| Phyllis | 2 | 6 | 10 | 51 | .621 |
| Janet | 0 | 1 | 12 | 56 | 1.000 |
| STUDENT NOVICES | | | | | |
| Denise | 2 | 0 | 10 | 57 | .028 |
| Brook | 1 | 14 | 11 | 43 | 1.000 |
| Barbara | 3 | 8 | 9 | 49 | .390 |
| Janice | 1 | 8 | 11 | 49 | 1.000 |
| Mark | 0 | 1 | 12 | 56 | 1.000 |
| Molly | 1 | 3 | 11 | 54 | .543 |

Note. A Fisher's p of 1.000 indicates a "hit" percent lower than chance, that is, in the wrong direction. (7/45, or 15.6%).

*$p < .05$. **$p < .01$.

For some, the experience proved amusing, as is evidenced in this recording of a man who stayed in the Cameo Room:

"I sat up in bed (in my dream) and looked in the mirror, which reflected the image of a young woman with light on her face, who was sitting to the left of the bed, watching. She had short brown hair.

"When I turned to my left to look at her directly, I couldn't see her and it was dark there. I think this happened twice in succession, but the second time it was a different woman -- about the same age, but with longer hair.

"I then heard a lot of talking or some sort of commotion out in the hallway. I woke up immediately, but noticed the place was silent.

"As I was going back to sleep after the previous dream, I felt the presence of a male, who wanted to be recognized. He had some connection with the military, as though he had to go to war, or had just returned. He had dark, somewhat curly hair and a medium build.

This individual later commented that the experience had definitely confirmed his beliefs in the paranormal.

"I don't normally remember my dreams," he said, " but these dreams were different. I was much more aware. The vividness was outstanding."

For others, this same type of "dream visitation" proved more traumatic, as is evidenced by the following woman's report:

"I dreamt I woke up from the dream and saw the clothes rack on the other side of the room in front of me. To the left of the clothes rack, I felt a presence. The presence was just watching us (her and her roommate) sleep. I didn't know what to do, so I began crying. I was terrified, but this was in my dream and then Janice woke me up. But it felt real to me.

"We went back to sleep, but I think we woke up again. I felt a presence right in front of me. All I said was 'go away from here' and then I went to sleep."

Another common factor amongst the dreamers included the ability for out of body experiences, as is evidenced in this man's report:

"At about 3:30 a.m. I awoke to hear a voice. It was my roommate having a dream. As I went back to sleep, I heard two female voices in the distance. A short while later, I heard another female voice whispering near me, but when I opened my eyes, no one else was in the room.

"Shortly thereafter, I had an unusual dream. I dreamt that someone from our group had laid down on the bed to my right. I told them that they did not belong there and I woke up to find no one there. I went back to sleep and began to dream again. This time I was walking the darkened halls of the Oliver House, first upstairs then downstairs. Then I sat with someone in the parlor where we had dinner earlier last night. After that I went back up to my room."

## STUDY NUMBER TWO

## A COMPARATIVE STUDY OF APPARITIONAL SENSITIVITY BETWEEN EXPERIENCED AND NOVICE PERCIPIENTS

*Background*

Over the nearly past seven years since my initial investigation of the Oliver House in October 1992, I have seen a continued interest in a field investigation practical lab experience amongst the registered students and previous class members of my Introductory Parapsychology class at Pima Community College in Tucson, Arizona. Within that time period, I have conducted several informal inquiries (with less content controls and an absence of statistical accountability). Even though these less formal inquiries are considered academic lab exercises, each session maintained strict site history secrecy prior to and during the subject walk-throughs and floor plan impressions were recorded in the same manner as the Oliver House Investigation. Sessions from successive classes included two additional informal replications of the Oliver House Investigation. Other similar inquiries included an informal investigation at "Big Nose Kate's Saloon" in Tombstone, Arizona; the Vendome Hotel in Prescott, Arizona; the Jerome Grand Hotel (formerly the United Verde Hospital) in Jerome, Arizona; and a formal restaurant in Tucson. Within this accumulated history of investigation experience, I found a pool of former students that composed what I considered to be an experienced group of individuals that could now be formally compared to a novice group.

Of the forty-six Bed & Breakfasts listed in the Tucson Phone Directory, none has quite the history that is evident within the walls of the Copper Bell. Designed in the early 1900's this unique lava stone structure was originally owned and occupied by a local Tucson architect, L.W. Boudreaux. Utilized as a private residence, rest home, and boarding house over the years, by the time Gertrude Eich purchased the property shortly after her arrival from Saarbrucken, Germany in September 1989, the Copper Bell was in a very run down condition. From the beginning of her occupancy however, she felt a comforting presence in several of the rooms. The Palm Room in particular, which she selected as her bedroom, was one that seemed most comforting.

It came as no surprise to her, when she later learned from one of Boudreaux's daughters that he died in the Palm Room in 1956. She has also felt a presence in the kitchen, while no one else was in the house, which assured her she was not alone. Several other similar sensations of having someone watching from behind throughout the house, as well as the mysterious relocation of various personal items suggested that this would be the ideal location for a haunting investigation by experienced and novice parapsychology students.

*Method*

In early April 1999, I established two groups of student sensitives to participate in a formal haunting investigation. The method used in this study, as in the Oliver House Investigation (mentioned prior), was again adapted from Schmeidler (1966).

*Subjects*

The subjects, or "sensitives," for this study included a group designated as the experienced students (who had at least one prior class haunting investigation experience) that were scheduled primarily for a Friday evening investigation. The second group, known as novice students (who were current introductory parapsychology students and had no prior haunting investigation experience), were mainly scheduled for Saturday evening. Although there was an attempt to isolate the groups as much as possible, there were some incidents of personal scheduling conflicts that intervened. Consequently, compensating alternate accommodations were made on both days.

The experienced student group included 7 males and 4 females, while the novice group consisted of 2 males and 5 females with a combined age range of 18 to 52. According to those participating in Auerbach's Psychic Experiences, Dreaming, and Beliefs Survey (discussed prior), seven (78%) of the nine reporting experienced students were classified as having a high degree of psi and dream phenomena experiences, and four of these were "believers" (in psi phenomena) while the other three were undecided. The remaining two experienced students were considered less exposed to psi and dream phenomena experiences, with an even split between undecided and skeptical ratings on the belief scale. Five (83%) of the six reporting novice students were considered as having a high degree of psi and dream phenomena experiences and "believers" (in psi phenomena). The remaining novice was considered less exposed to psi and dream phenomena, but still a "believer." Two experienced students and one novice arrived late due to previous commitments and were unable to take the pre-investigation survey.

*Instruments*

The instruments used in this study were:

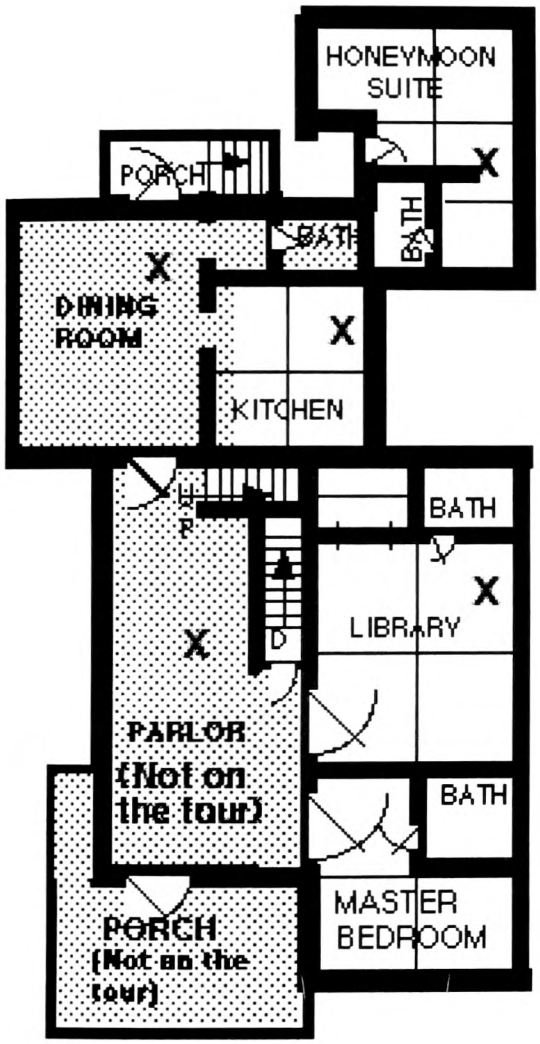
*The Auerbach Psychic Experiences, Dreaming, and Beliefs Survey.*
Described in the previous study and detailed above, this is a condensed version of assessments developed by Loyd Auerbach (Auerbach, 1986; 1991).

*A Scale Diagram of the House.*
(See Diagram #2). A detailed sketch of both floors of the building was created by the author. Accessible rooms (with two exceptions) were then quartered for the grid. The Honeymoon Suite downstairs (slightly larger by comparison) and the Phoenix Room upstairs (slightly smaller) had additional or reduced sections included, as appropriate. Photocopies were then produced in sufficient quantities for Gertrude Eich, the resident manager and the investigation personnel. Prior to the investigation, Ms. Eich prepared a control copy by placing an X in each location where she had felt a ghost presence.

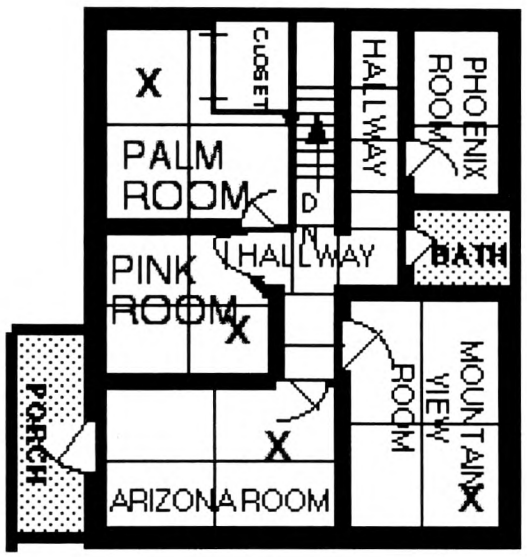
*Change in Instruments from the Previous Study*

*A revised version of Gough's Adjective Check List.*
Although a revised version of Schmeidler's condensed list was attempted in the Oliver House Investigation, the resultant lack of compliance and general dissatisfaction with its use prompted me to discontinue its inclusion in the second study.

**DIAGRAM 2 - FIRST FLOOR & SECOND FLOOR**
**FLOOR PLAN OF THE COPPER BELL SHOWING HAUNTING SITES ACCORDING TO MANAGEMENT**




Copper Bell Bed & Breakfast First Floor




Copper Bell Bed & Breakfast Second Floor

*Procedure*

On both evenings of our investigation, participants who arrived on schedule had time to relax, meet the manager, and have dinner as a group, but again there was a strict rule prohibiting any discussions of the

reported haunting in this house. Any unique artifacts or room dressings that were thought to possibly provide any clues to the history of the room or house was previously removed by the management preceding our arrival. Immediately after dinner, each student participant completed a variation of the "Auerbach Psychic Dreaming-Psychic Experiences--Psychic Beliefs Survey" (1986) (1991) in order to establish a measure of their individual experiences and "sheep/goat" orientation. Once this information was independently established, the main walk-through began. Participants were each given a comparably sectioned floor plan of the house and asked to record the location of any ghosts they may experience. The entire house had been divided into 45 "traffic controlled" areas for the purpose of our investigation. The only areas not designated for use were the common areas of the dining room, the parlor, the front and upper balcony porch areas, and the common bathrooms on the first and second floors.

As in the Oliver House investigation, participants were again told that they would be randomly touring the house one room at a time on an individual basis with hall monitors assuring single room occupation for no more than 10 minutes. Recording similar "haunting" impressions within the upstairs hallway was also encouraged, if appropriate. Photographs were also encouraged, but not required. On completion of the second floor, participants were instructed to return to the dining room and were restricted from discussing their impressions until all participants had completed the tour. Approximately ninety minutes later the Friday night walk through was completed. Saturday's group completed the task in just over an hour.

Since the Copper Bell was also a bed and breakfast, we again had the advantage of being able to stay overnight in the house. Upon completion of the walk-through, personalized journals were again distributed for the recording of significant overnight experiences and dream impressions. Evening room assignments were also announced and anyone who felt uncomfortable with their designated room was offered the opportunity to request another. As with the Oliver House however, no one felt any room changes were necessary.

*Results*

*A Location of Hauntings*

As mentioned earlier, the entire house had been divided into 45 "traffic controlled" areas for the purpose of our investigation. At my request, the management had previously filled out a control plan indicating 7 accessible haunted areas (3 on the first floor and 4 on the second) which was later converted to a transparent overlay.

As per the Schmeidler methodology (cited earlier), for each sensitive, data were cast into a 2 x 2 table: haunted units vs. non-haunted for the house management vs. sensitive. Associated responses between house management and sensitive reports were evaluated by the Fisher Exact Method. As seen in Table #2 below, the floor plan responses show five of the seven novice students actually scored lower than chance, while only one of the eleven experienced students did so. (This is captured visually by the "1.000" p-values). Thus, despite the one exceptional novice (JJ), the novice group seems to have been less successful than the experienced group.

The difference between the two groups was assessed by a Mann-Whitney test, using the Fisher p-values as the dependent variable. The Mann-Whitney test shows that there is a statistically significant difference between the groups ($U = 16$, $U' = 61$, $z = 2.06$ {corrected for ties}, $p = .039$, two-tailed), thus confirming the benefit of previous experience in haunting investigations.

Table 2
FLOOR PLAN RESULTS OF EXPERIENCED VS. NOVICE STUDENTS

| Student Management | Haunted | | Not Haunted | | Fisher´s p-Value |
|---|---|---|---|---|---|
| | Haunted | Not Haunted | Haunted | Not Haunted | |
| EXPERIENCED STUDENTS | | | | | |
| Ahmid | 1 | 0 | 6 | 38 | .156 |
| Brian | 1 | 2 | 6 | 36 | .405 |
| Ellen | 1 | 1 | 6 | 37 | .290 |
| Ken | 2 | 5 | 5 | 33 | .296 |
| Linda | 1 | 0 | 6 | 38 | .156 |
| Marsh | 2 | 3 | 5 | 35 | .166 |
| Patrick | 2 | 8 | 5 | 30 | .642 |
| Pete | 3 | 3 | 4 | 35 | .039* |
| Sam | 1 | 8 | 6 | 30 | 1.000 |
| Bill | 4 | 5 | 3 | 33 | .022* |
| Yolanda | 1 | 1 | 6 | 37 | .290 |
| NOVICE STUDENTS | | | | | |
| Andrew | 0 | 2 | 7 | 36 | 1.000 |
| Angie | 1 | 6 | 6 | 32 | 1.000 |
| Jami | 2 | 6 | 5 | 32 | .590 |
| Jean | 0 | 2 | 7 | 36 | 1.000 |
| JJ | 6 | 10 | 1 | 28 | .005** |
| Michael | 0 | 2 | 7 | 36 | 1.000 |
| Nancy | 1 | 5 | 6 | 33 | 1.000 |

Note. A Fisher's p of 1.000 indicates a "hit" percent lower than chance, that is, in the wrong direction. (7/45, or 15.6%).

*p < .05. **p < .01.

*B Overnight Journals*

As in the Oliver House study, I also requested overnight journals of both groups in the follow-up study. Following breakfast on the succeeding mornings, still unaware of the house's history, I placed six assorted photographs on the dining room table for group inspection and asked the participants to check if any of the

collected individuals were either in their dreams or perceived the previous night. No one indicated any familiarity. Various participants were then invited to share their reports of the overnight experiences. Of the five journal accounts provided, all were from Friday night participants. With a majority of the Saturday group staying up well past 4:30 in the morning, there was little time available to them for REM sleep. Four of the five Friday night accounts reported dream experiences, only one of which appeared remotely common to the "dream state visitations" reported at the Oliver House. This report came from a gentleman who was later able to draw a sketch of the individual he saw in his dream:

> " I drew this man's portrait (Diagram #3) about 45 minutes after I had the dream about him. The dream itself seemed short, and looked kind of like a home movie, where the color was faded and washed out. The old man was in a sitting position wearing a white t-shirt. He was looking up at me and speaking, but there was no sound. His mouth was strangely distorted like someone who had experienced a stroke and was partially paralyzed. I don't know if he was the same presence I sensed in the upstairs hallway, but his general appearance was the same: bald, old, frail, quite tall and thin. My sense of his "time" is largely based on how he was dressed. I guess these images were at least 30 to 40 years old."

Although the individual who drew the sketch had an early morning appointment, he did leave his journal for our examination. When presented to the remaining participants for their inspection, it was noticed that the sketch bore a strong similarity to photo number two (Diagram #4), which was the photo of Mr. Boudreaux. In placing the chronology of the sketch, the artist claimed the individual to be about 30 to 40 years dead. Consequently, a 40 year difference would put the year as 1959 and Mr. Boudreaux died of a stroke in 1956.

Diagram 3



Diagram 4



Two of the remaining four dream reports were of events taking place in the house, but had more traditional dream content and were unrelated to past events, as was characteristic of the dream hauntings at the Oliver House.

*Discussion*

The results of the Oliver House haunting investigation are open to multiple interpretation, one of course being that they are the results of chance. The modest level of significance would certainly support such a null hypothesis, were it not for the nature of the participants. Significant results were obtained by the professional psychic and one novice student. While the significance of the professional psychic may be expected, the conservative performance of the significant novice may tend to provide an explanation as to why the other participants showed less significant results.

Given that the student participants in the investigation were introductory parapsychology students with no prior investigation experience one begins to realize the level of excitement in anticipation of the investigation process. It would appear therefore, that a naivete to the haunting investigation experience could certainly be perceptually handicapped by false impressions and a misunderstanding of what they are experiencing. Since hypersensitivity may tend to obscure "true" sensitivity to the haunting phenomena, there would appear to be a psychological factor which tends to impede successful results. Furthermore, it would also seem that familiarization with the basics of alleged ghost sensitivity would require the same amount of practice as the development of any other professional skill. Indeed, it would seem that the high level of excitement and anticipation experienced on the initial investigation may tend to work against the percipient in his/her refinement of the initial perceptions received in the haunting investigation process.

Of particular interest to the initial study is the associated account of dream reports collected via the overnight journals. One common experience reported by half of those who offered journal episodes included material suggestive of the traditional out-of-body experience represented as a dream of walking through the halls of the Oliver House. Another experience, tentatively suggests of an out-of-body episode with lucid qualities, that was characterized by the feeling of being awakened within the dream and becoming aware of a presence within their room.

Since those who reported these dream experiences recalled being aware that they were dreaming of being in their own room (a reality simulation), yet experiencing someone not actually in their contemporary environment, could these episodes be tentatively suggestive of haunting visitations from former residents within an altered state similar to those of professor Tokuda, as mentioned earlier by Mishlove?

In reviewing the Bisbee dream haunting experiences, once might ask, "Could these experiences be nothing more than dream incubation?" That is, were the dreamers experiencing something similar to collective programming or self-fulfilling prophesy since each of them were at the Oliver House for the specific purpose of having some sort of paranormal experience. In other words, expect to encounter ghosts and you will dream about ghosts. Perhaps even a certain amount of what one dreams about, perceives, or envisions is bound to match the history of the location.

As anticipated, the second study reported more significant results from the experienced students when evaluated by the Fisher Exact Method and a comparative Mann-Whitney test. In fact, five of the seven novice students actually scored lower than chance, as compared to only one of the eleven experienced students. In spite of the one exceptional novice (JJ) that tended to excel over the rest, the novice group seems to have done considerably worse than the experienced group. Such results tend to acknowledge the skilled novice, while at the same time recognizing the benefits of previous experience.

Although the intent of the haunting investigation is to attempt the substantiation of the management (control) experiences, there are two possible explanations as to why a high variance in response correlation may be occurring. The first, which is more indicative of a true novice, would be that the perceived sensations are completely inherent to the individual. The other option would imply a unique experience with the ghost, totally unrelated to the management control. Although Schmeidler's quantitative methodology of haunting investigation has been a long standing respected method of paranormal research, there may be an inherent limitation to its capabilities. Implementation of the methodology implies the use of agreed upon witness controlled, specific, testable information, commonly recorded as experiential information on a floor plan design of the haunting site. This physical recording is time based and depicts the inherent characteristics of a classic haunting. According to Rogo via. Mitchell (1974), a haunting is experienced "when an apparition is seen habitually by various witnesses over a long period of time and in one specific locality." And Roll (1995) concurs with a reference to the impressions of his former Oxford University professor, H. H. Price, who felt that hauntings could be explained as *place memories,* where locations would also possess the memories of events that have taken place in a particular area.

Many mental mediums, failing the ability to interact with haunting phenomena, often refer to them as *psychic residue*, preferring to directly interact with apparitions of the dead. Hauntings then, are more characteristic of an exact location, whereas apparitions seemingly possess a personality, mind and spirit, and quite often mobility, without the benefit of a physical body. The mobility factor would appear to be the inherent flaw to Schmeidler's methodology and confines the experience to the perceptions of the control individual at the time of his recording. The percipient, either novice or experienced, is then restricted to the same exact impressions and must disregard any personal experiences he may have which may be more apparitional in nature.Consequently, it would seem more accommodating to somehow include the total investigation experience as a valid phenomena. The appropriate question would then appear to be, how could these total experiences be accurately measured, recorded, and agreed upon in order to establish significant validity?

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# PSYCHOLOGICAL AND ELECTROMAGNETIC ASPECTS OF HAUNTS[1]

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## ABSTRACT

Twelve sites were investigated where unexplained footsteps, apparitions, electrical disturbances, strange behavior by pets and other haunt phenomena were reported. Recordings were made of the local geomagnetic fields (GMFs), electromagnetic fields (EMFs), and ion densities. On the basis of previous studies, it was predicted that the sites would exhibit anomalous EMFs or GMFs. Ten of the sites showed such anomalies. At three, there were intense, transient EMF increases. At one of these the anomaly was attended by a drop in temperature and an apparitional sighting by one of the investigators. At one site an intense and constant EMF overlapped with an intense local GMF. The remaining eight sites showed normal EMFs, except in proximity to electric installations. Six sites exceeded the norm for GMFs by 200 milligauss (mG) or more. Four of the sites showed intense EMFs as well as intense GMFs. At two sites the EMFs and GMFs were normal. Ion densities above 2,000 $cm^3$ were detected at seven sites. At two of these there were extreme positive ion densities in occupied areas of the home; in two others, the extreme positive counts were limited to unoccupied cellars. Positive ions are associated with negative affect. Photographic anomalies were obtained at three of the haunts with standard 35mm cameras, digital cameras and/or infrared video cameras.

Most of the haunt phenomena could be accounted for in terms of the physical energies recorded at the sites. Apparitions, which were reported in all cases except one, may be elicited when magnetic fields are applied to the right temporal lobe. The same is true for the sense of „presence," sleep paralysis and attendant fear, and for unexplained episodes of depression and aggression. Tactile sensations described by a member of one of the families may result from piloerection, electrostatic fields or direct electric stimulation of the brain. The electric disturbances mentioned by two of the families may result from a magneto-restrictive process that distorted the electric circuits. The sound of „footsteps," common to several of the haunts may have been due to magneto-restriction progressively affecting heating ducts or plumbing. Other acoustic experiences, such as the hearing of human voices, may have been due to direct electric stimulation of the auditory cortex. The dogs which reacted strangely at one of the sites may have been alerted by ultrasounds or direct electric stimulation of the hippocampus and amygdala. There were two sites where sudden drops of temperature were reported. This may result from a voltage increase between two dielectric plates, e.g., slabs of limestone below the site that are separated by a thermoelectric material. This process, known as the Peltier effect, is associated with increased heat below ground. If the current is reverse, the cooling may occur below the house while the heat may accumulate within the house and cause spontaneous fires. Such fires were reported at one of the sites. Either process may be initiated by the strain associated with a geological fault in the area. At two of the sites, doors seemed to close by themselves. This may have been be due to magneto-restriction on the ferrite components of the doors. The disappearance and reappearance of objects, reported at one of the haunts, may be due to automatic behavior and amnesia induced by the anomalous magnetic field. One family described movements of stationary objects. These may have been RSPK, and cannot be accounted for in terms of known energies. While some haunts may be harmless, others may be dangerous to the human and animal occupants. Because of the role of the amygdala and the insula in the regulation of heart synchronization, electrical disruptions in these regions by specifically timed electrical currents coupled to the normal feedback from the heart into the brain can produce cardiac aperiodicity and even death.

[1]The authors gratefully acknowledge support for these investigations from the Institut für Grenzgebiete der Psychologie und Psychohygiene, Freiburg i. Br., Germany. Thanks to Michael Persinger for providing crucial source material, and to Michaeleen Maher for helpful suggestions in presenting the data.

## INTRODUCTION

Human perception and electronic measurements have been the two major methods employed to determine whether haunt phenomena are more than imagination. Studies where psychics and controls marked floor-plans and checklists according to their impressions of the haunted areas and the personalities of the "ghosts" are summarized by Maher and Hansen (1992). During an investigation of a Japanese restaurant (Roll, Maher & Brown, 1992), Maher found the places where witnesses reported haunt experiences were associated with elevated intensities of electromagnetic fields compared to control areas ($p = .007$). In two cases (Maher, 2000; Maher & Hansen, 1997) she found no relation between the active areas and electromagnetic readings. To understand the limits and possibilities of electromagnetic measurements at haunt sites, it may be helpful to distinguish between long-lasting (constant) and transient electromagnetic fields (EFMs) and between electromagnetic and geomagnetic fields (GMFs).

*Constant vs. Transient Electromagnetic Fields:*

Constant EMFs are registered relatively easily by magnetometers. However, the detection of transient changes in the intensities of magnetic fields requires long term monitoring. This can be achieved by interfacing the meter with a laptop computer. In an investigation of a hunting lodge in Texas, the intensity of the local EMF was stable except during the early morning hours when transient increases in field strength coincided with haunt experiences (Roll, Sheehan, Persinger & Glass, 1996).

Power frequency EMFs are usually generated by human installations. These fields have peak frequencies of around 60 Hz in the U.S. and 50 Hz in Europe. The general background intensity in most living spaces, not adjacent to electronic sources, is about 0.5 milligauss (mG) to 2.0 mG. Unlike electric fields that can be shunted or grounded by walls, magnetic fields display marked penetrability into and through living space. Consequently nearby power lines can significantly affect the background intensity of magnetic fields within the house. Very local increases in intensity, from 10 to 100 centimeters from computers or ovens, can range between 20 mG and 50 mG.

Transient EMFs have been measured within houses with inadequate grounding. Routine operation of electronic equipment, such as dishwashers or stereo systems within the house or varying loads on local transformers from power usage by neighboring houses, can induce frequent transient intensities (several times per hour, each lasting a few seconds) of between 10 mG and 100 mG at localized areas within these houses. Ground currents external to a poorly grounded house, can be affected by concurrent geomagnetic activity. Transient EMFs may also result from piezoelectric currents generated by changes in tectonic strain at nearby geological faults. Precipitating sources for these changes in rate of strain include passage of air masses and lunar tidal forces.

*Geomagnetic Fields (GMFs):*

The earth's averaged magnetic field exhibits a total intensity of about 500 mG. This general value ranges from a maximum near the magnetic poles to a minimum near the magnetic equator. Values for the total magnetic field intensity are about 250 mG at the equator and about 750 mG at the south pole. In the U.S. the total magnetic field intensity varies from 500 mG in Florida to 600 mG at the northern border with Canada.

The geomagnetic field has a small time-varying component, mainly driven by changes in solar activity. The intensities of these changes range between 0.1 mG and 1 mG and their frequencies from .001 Hz to 1 Hz. Their durations are usually a few minutes to tens of minutes.

Both correlational and experimental research indicate that changes in magnetic field strength once a minute or for several minutes per hour during the night can increase the frequency of seizures in patients

and animals with epilepsy (Michon and Persinger, 1997). The field strengths required to produce these electrical changes are only about 0.5 mG, particularly when applied during the night in the dark. The importance of darkness is associated with the presence of melatonin in the brain. This derivative of serotonin, which has a critical role in mood disorders, has been shown to be sensitive to small amounts of light and to weak magnetic fields (Persinger, 1996). Geomagnetic activity may be related to the onset of RSPK (Roll, 2000). It is not known what effect if any it may have on haunts.

Although changes in the intensity of geomagnetic activity have been employed to measure or infer the effects of these changes on living systems, these measures do not reveal the frequency structure of the magnetic variations. There is now evidence that different bands of intensity of geomagnetic activity are associated with the transient generation of continuous pulsations and higher frequencies, lasting for minutes to tens of minutes, that are within the range of human electroencephalographic activity (O'Connor & Persinger, 1999).

While the earth's magnetic field is fairly stable, local conductors within the crust, such as streams of water and ore bodies, may cause substantial increases or decreases in the total intensity of the earth's field. Depending on the flux lines from the conductors, the anomalies may extend to the surface or beyond, and last a few days to months or years. Transient increases of intensity in the local magnetic field due to tectonic strain may precede earthquakes by months or years. The anomalous local GMFs are most clearly associated with haunts. Persinger (1974a) was the first to draw attention to this connection.

*Ion Densities:*

Very local, intense EMFs and GMFs may increase ion density with associated effects on the moods of people at the site. There are of two types of ions from a biological perspective, positive and negative ions. Positive ions are associated with increased irritability, depressive moods, and restricted respiration. Negative ions, within an optimal range of concentration, have oppositive effects. Silverman and Kombleuh (1957) found that subjects exposed only 30 minutes to 1,800 ions (positive or negative) per $cm^3$ showed a conspicuous change in EEG activity, particularly within the range of alpha (8 to 13 Hz) frequencies. Charry and Hawkinshire (1981) observed that the Santa Ana wind, which is associated with increased crime, suicide, irritability, and tension, has positive ion levels of up to 5,000 per $cm^3$ compared to normal levels of 500 $cm^3$.

Ions can be associated with radom, a radioactive gas that is frequently found in basements of houses built over certain types of rocks. Radon emission from the ground can be increased by movements of air masses over the region. The emission and the accumulation of this gas, particularly within closed rooms, often precedes an increase in earthquake activity within a region and may be related to focal increases in tectonic strain. In classic external haunts or „ghost lights," the objective detection of the light is frequently accompanied by both high frequency electromagnetic emissions within the range of sferics and low radiofrequncy as well as the presence of radon gas (Persinger, 2000, private communication).

## HAUNT PHENOMENA AND ENERGETIC FIELDS

We use the term electromagnetic both for EMFs and GMFs. According to Persinger, (Persinger, Tiller & Koren, 2000) exposure to anomalous, constant electromagnetic fields even when strengths exceed several thousands of mG may not by itself be conducive to haunt experiences. What may be critical is the brief exposure to magnetic fields whose temporal patterns imitate the relevant brain activity. This can occur from exposures to bursts of electromagnetic energy or by the person moving between fields of different levels of energy. In the case of GMFs the change must exceed 10 mG per meter of normal walking speed

to result in haunt experiences (Persinger, 2000, private communication). In other words, if an mG field shows a variation of 100 mG within an area of 10 meters, this may not result in anomalous experiences. We considered long term exposure to either positive or negative ion densities above 2,000 $cm^3$ to possibly contribute to anomalous experiences, and positive ion densities above 2,000 $cm^3$ to have detrimental effects.

*Apparitions:*
Konig, Fraser and Powell (1981) and Halgren, Walter, Cherlow, and Crandall, (1978) have found that persons living in locations of strong electromagnetic fields may become apparition-prone. They suggest that people who are especially sensitive to electromagnetic fields may previously have been exposed to such fields. Recently, Persinger, Tiller and Koren (2000) elicited an apparitional experience (and concomitant electrical seizures within the temporal lobe) in a man who lived in a haunted house and had perceived an apparition. The experience was elicited by applying a weak (10 mG) magnetic field for only ten minutes over the right temporal lobe. The frequency of the field was modulated into specific patterns of 6-25 Hz and was directed at the right temporal lobe. Neither the experiences nor the electrical activity of the brain was evoked by other shapes of magnetic fields, even at higher intensities.

*Sense of a "Presence":*
A sense of "presence" is commonly reported by individuals who are hypersensitive to magnetic fields (Smith, Choy & Monro, 1986; Smith & Best, 1989). The sensation is due to electromagnetic stimulation within one (usually the right) of the temporal lobes (Halgren et al., 1978). The sensation is also displayed by normal individuals who exhibit temporal lobe sensitivity (Persinger, Tiller & Koren, 2000; Ruttan, Persinger & Koren, 1990).

*Sleep Paralysis:*
In sleep paralysis a person may waken with a feeling of immobility and fear. The experiences tend to occur before the onset of normal dreams and may be facilitated by recent changes in brain function from closed head injury or insufficient blood supply. The experiences are similar to dream-like states (identified by specific EEG patterns) where normal subjects experience body weakness, or decreased desire to move, when complex magnetic fields are applied across the brain. The paresis is frequently associated with the feeling of a sentient presence (Persinger, 1999, private communication).

*Depression and Aggression:*
Depression and heightened aggression have been induced in animals by exposure to complex magnetic fields (DeLorge & Grissett, 1977; Persinger, 1974b).

*Tactile Sensations:*
The sensations of being touched may be due to piloerection, in which the hairs of the body become erect in the presence of an electrostatic field. Tingling sensations, (somesthesia) can be induced by direct electrostatic stimulation of the dermal nerves or by electrical stimulation of the brain induced by complex magnetic fields (Persinger, private communication, 1999).

*Acoustic Phenomena:*
"Footsteps" and knocking sounds may result when a magnetic field progressively affects heating ducts and plumbing, a process known as "magneto-restrictive acoustics" (Burke, 1986, p. 264). Subjective auditory experiences of banging sounds and human voices (usually incomprehensible) may be due to electric stimulation of the auditory cortex or to the induction of localized electric seizures within the limbic system. The latter experiences have often been evoked by stimulation with electrodes during brain surgery.

*Electric Disturbances*
A magneto-restrictive process may deform the ferrite components in electric equipment, causing light bulbs to blow and electronic equipment to malfunction. When the anomaly ceases, the components may resume their original configuration, and the equipment may function normally (Burke, 1986).

*Cold Spots and Spontaneous Fires:*
Sudden drops in temperature above ground may result from a voltage increase between two dielectric plates, e.g. slabs of limestone below the site that are separated by a thermoelectric material (the Peltier effect, Persinger, 1974a). The process is associated with increased heat below ground. If the current is reverse, the cooling may occur below the house while the heat may accumulate within the house. Either process may be initiated by the strain associated with a geological fault in the area.

*Floating Lights:*
"Ghost lights" are generally spherical, from several inches to several feet in diameter. Such luminosities may be piezoelectric phenomena generated by tectonic strain (Persinger, 1974b). Since the human body emits an electromagnetic field that distorts the local electric field, it may attract or repel the orbs depending the body's electric properties. This movement may be interpreted as "intelligence." Subjective luminous phenomena may be magneto-phosphenes, due to direct stimulation of the retina or to electrical induction by the applied magnetic fields on the occipitotemporal regions of the cerebrum (Ruttan, Persinger and Koren, 1990).

*Responses by Animals:*
The behavior of household pets may be affected by high frequency sound, inaudible to humans, which can be produced by anomalous magnetic fields. The fields can also directly affect the hippocampus and amygdala (the most electrically sensitive structures in the brain) and evoke affective responses.

*Movements of Objects:*
The movement of balanced objects, such as doors, rocking chairs, suspended lamps and pictures on walls may be magneto-restrictive effects, assuming the objects have ferrite components. The movement of stationary objects, as in RSPK, cannot be understood in terms of known energetic fields. The disappearance of objects in one location to be found in another ("teleportation" or "apport") is also beyond the reasonable predictions from current concepts. It should be noted, however, that anomalous magnetic fields can affect the memories of those present. Individuals who report these phenomena may have forgotten that they themselves moved the object. Automatic behaviors with associated amnesia are common correlates of excessive stimulation within the left temporal lobes (Persinger, private correspondence, 1999).

## Recent Investigations of Haunts

Twelve haunts that were investigated with support from the Institut für Grenzgebiete der Psychologie und Psychohygiene are reported. The studies were conducted in 1999 and in one case also in 2000. Seven of the sites had been explored previously without adequate instrumentation. On the basis of previous work, we expected that the sites would show anomalous electromagnetic fields (e.g., Persinger, 1974a; Radin & Roll, 1994; Roll, Maher & Brown, 1992; Roll, Sheehan, Persinger & Glass, 1996). To test this hypothesis we used a frequency weighted Tri-Field electromagnetometer, an Extech model IDR-321 geomagnetometer, an Extech data logger/multi meter with ELF/VLF electromagnetic field probe, a Raytek Raynger self-illuminated non-contact thermometer, an Alphalabs Air Ion Counter, and at some sites also photographic equipment.

*Dragsholm Castle, Denmark (Feb. 13-15, 1999):*
Dragsholm Castle was built in the 13th century as a bishop's residence and fortress. After the reformation it was taken over by the Crown and became a state prison. The most prominent prisoner was the Earl of Boswell (husband of Mary, Queen of Scots) whose carriage, it is said, can be heard at night rumbling over the cobble stones. The Castle is now a museum, hotel and restaurant. There is a Chapel and a small Theater for stage performances. During a previous visit (Roll, Moody & Radin, 1996) witnesses told of carriage sounds, white shapes and lights outside the Grey Lady's room and cold chills in the same area. Feelings of presence were mentioned, and two apparitions were described in detail. Several physical incidents were reported, most often the closing of doors without apparent cause.

The present investigation (see Nichols & Roll, 1999, for the full report) was focused on the measurement of physical energies at three sites where employees told us about recent occurrences, the Grey Lady's Room, the Knights' Hall and the Theater. Thormod Balterød, head of the restaurant, said he was in the Grey Lady's Room talking about the Grey Lady with a waitress, when they heard a hard slap from the table; Kirsten Nielsen, the Housekeeper, said she saw an apparition in the Knights' Hall; and Jens Brantenborg Hansen, a guide, experienced an intense cold chill and anxiety attack in the Theater.

On February 14, Nichols took measurements in the three areas. No energetic anomalies were found in the Knights' Hall. In the Grey Lady's Room an elevated EMF, also found previously (Radin & Roll, 1996) was detected near a fuse box. At about 7:15 PM, he went to the Theater on the fourth floor and assembled the equipment on a bench opposite the stage. No unusual occurrences were noted the first two hours. At 9:26 p.m. he felt a sudden decrease in temperature. To determine if this was objective, he retrieved the thermometer and found a decrease of up to 13 degrees Fahrenheit (58 versus the ambient 71 degrees) in an area of about five feet in diameter. The anomaly lasted 45-60 seconds. During the temperature drop, the EMF field increased to 100 mG, the maximum threshold of the meter, but was normal outside the "cold spot." The GMF remained normal at about 527 mG. The anomaly abruptly ceased at 9:27 p.m., the temperature and electromagnetic field returning to 71 degrees Fahrenheit and 3.5 mG. Immediately afterwards, when Nichols went across the room to record the event he saw a figure in light-colored clothing move across the doorway to his left, that is, in his left peripheral field. The event lasted a second or less but was accompanied by a sensation of deep apprehension although there was nothing overtly threatening about the vision. Nichols went out in the hall to ascertain if someone had passed by. He found no one. Footsteps are normally audible on the wooden floors, but there was no sound when the figure went by. Nichols continued to monitor the Theater and the hallway until 10:15 p.m. but observed no further anomalies. Ion concentrations measured throughout the evening and immediately following the anomaly were not significant. With the exception of Nichols and three staff members in the kitchen-dining room area, who denied having been on the fourth floor, no one seemed to be in the Castle (see Table 1 for the GMF, EMF, and ion readings).

February 15th Nichols was taking photographs in the Chapel when the heavy door to the hallway slammed shut. There were no open doors or windows to cause a draft, no one else seemed to be present, and the door would not close without being pushed. Subsequent EMF and GMF readings in the area revealed no anomalies, but this does not preclude a transient anomaly. The ion counts at Dragsholm were lower or equal to 1000 $cm^3$.

*Engsö Castle, Sweden (Feb. 17-19, 1999; April 10-11, 2000) :*
Engsö was built on a granite island in Lake Malaren that is now part of the mainland. The first known owner was King Eric IX, the patron saint of Stockholm. The present structure has four floors of which the first was built in 1480. It has been the home of the Piper family since 1710. The present occupant is

Countess Catharina Piper who operates the Castle as a museum. It is otherwise unoccupied. Countess Piper resides in the unattached Gatehouse.

There are three traditional ghosts. One is Brita Bååt, whose full-figured painting is on the stairs. The ghost of a hunchback dwarf, Anders Luxemburg, may be seen between the Castle and the church where he is buried. The third ghost is a dog. Countess Piper said she has seen an apparition that resembled Brita Bååt three times. Each time she was standing in the doorway of the main room off the landing on the third floor. A friend of Countess Piper said she once saw a small figure, she thought might be the ghost of Anders Luxemburg, scurry along during a theater performance in another part of the Castle. People have reported occurrences elsewhere on the property that we have not investigated.

During a previous investigation (Roll, Moody & Radin, 1996) Moody and Radin went through the Castle, each by himself, to try to pick out the haunted area. They had not been informed about the experiences of Countess Piper and her friend. When Moody reached the third floor, he felt "... a twisting or a dislocation of myself in space...almost like an energy or a force acting on me." He associated the sensation with a sentient presence. He went into the main room and from there to a room on the right where mannequins in period costumes were exhibited. There was a large gold-framed mirror, and he pulled over a chair and gazed into the mirror. Almost immediately "something emerged from the mirror and it had the outline shape of a human being...It was a luminous presence, within human size. And it emerged from the mirror and came right out in front of me." Radin also felt odd about the third floor, and this floor only. He sensed an internal "rumbling, not exactly a sound, but more like a sense that there was a motor deep within the floor or walls, creating an infra-sound vibration." This was strongest in a room immediately adjacent to the room where Moody had had his apparitional encounter. At one point, Radin saw a brilliant blue-white light flash in his peripheral vision. He thought that the light came from a car's headlights, but learned that no cars had passed by.

Late in the afternoon of February 17, 1999, during the present investigation Nichols (See Nichols & Roll, 1999, for the full report) attempted to obtain a subjective impression of which area or areas might be haunted by touring the structure by himself while Roll and Countess Piper were in the downstairs dining area. To keep Nichols blind about the target site, he had not read the previous report. During the following two days he took measurements throughout the Castle, still without any knowledge of the location of the site. The only area that felt unusual was the third floor, beyond the entrance, where he had a sensation of "energy." The only area with an anomalous magnetic reading was approximately in the same area. While the GMF was about 650 mG elsewhere in the Castle, it was 752 mG at this site. (These readings were obtained April, 10, 2000; the values from 1999, 157 mG for the special site vs. 2-3 mG elsewhere, we believe to be erroneous.) The effect was not transient but remained stable during the investigation. The ion counts at the Castle were about 1,750 $cm^3$ for positive and 2,200 for negative ions.

*Fort Leonard Wood, Missouri (Mar. 12-15, 1999):*

At the request of the housing officer at the army base, an investigation was made of a duplex that had been occupied by a sergeant, his wife and three sons (for the full report, see Roll and Nichols, 1999). The family had vacated the home because of unexplained footsteps, flickering lamp bulbs, dark figures, strange behavior by their two dogs, tactile sensations, experiences of possession, and aggressive episodes. Objects would disappear and later be found in other locations. A military policeman and his wife, who occupied the other half of the building, heard footsteps from the duplex when this was empty. The investigation revealed a GMF that escalated from 28 mG to 561 mG from one end of the duplex to the other. The normal movement of the family would cause exposure to a drastically changing GMF. The occupants of the other

half of the duplex and of a duplex across the street reported no unusual experiences and their homes showed no GMF anomalies. The EMFs and ion counts were normal at all sites.

March 14, 1999, 8:30-11:45 p.m., the investigators took 147 flash photos with standard 35mm Canon cameras and 400 speed Kodak Gold Max film. About half of the photos were taken in an upstairs bedroom from the same position in the room. Two humidifiers had been left in the hope that humidity would facilitate anomalous effects. Most of the photos only showed the floor and walls of the unfurnished room, but six had distinct anomalies, including two where bright circular lights surrounded by black entirely obscured the room. Evidently there was a dark obstruction in front of the camera that reflected the flash but was invisible to the investigators.

*McRaven House, Vicksburg, Mississippi (May 28-30, 1999):*
McRaven House was a Confederate campground and field hospital during the American Civil War and the scene of many deaths and burials. It is now a museum and the home of Mr. Leland French. He and the tour guides describe apparitions of Civil War soldiers, former occupants and an African-American boy. According to Mr. French, the piano plays by itself about once a week and the piano stool moves out. He said there are two or three occurrences a week, and more during Civil War re-enactments and full moons. We arranged the investigation to coincide with Memorial Day weekend when there were frequent re-enactments and also a full moon. The front door locked by itself during this period, according to Mr. French (see Andrew & Roll, 2000 for a detail report).

An interesting finding was due to Ms. Janis Ralay, a local investigator. Using a digital flash camera, she had recorded orbs outside the building at night. Using her camera and our own disks, we took 172 photos of which 12 showed orbs, some of them several dozen. The orbs were circular, translucent and with a diameter of about six inches. We took 144 photos at the same time and place with 35mm Canon cameras, of these 3 showed orbs. The GMF in the house was 350-450 mG, and fell off with increased distance. The EMF in the house was 3-8 mG. The positive ion count was 1,500-1,900 per $cm^3$; the negative 3,000-3,700.

*Madison, Indiana (June 28-30, 1999):*
Intense haunt occurrences were reported by Doretta and Ron Johnson and their pre-teen daughter during the 12 years they have occupied the home. The phenomena included slamming doors, sounds of human traffic, foul and flowery smells, apparitions, cold spots, spontaneous fires, illnesses and aggressive episodes. The family also reported ostensible RSPK incidents in proximity to Ms. Johnson. During two previous visits, Roll had noticed that the house was located in the center of a triangle of high-tension power lines and suspected an anomalous EMF. The presence of this was confirmed when the investigators detected an intense EMF of 126-157 mG in the home. This overlapped with a strong GMF of 725-847 mG. The latter probably originated in a stream under the house since the backyard was chronically flooded. The positive ion count was 5,000 per $cm^3$ and the negative 17,000.

*Haney Home, Kings Mountain, North Carolina (July 17-19, 1999):*
A newly married couple, Tim and Tracie Haney, requested an investigation of unexplained footsteps, cold and hot feelings and overheating of their several fish aquariums even after repeated replacement of the heating elements. This minor haunt began one month after they married and moved in, three months before our arrival. The GMF was moderate, ranging from 540 to 616 mG in the home and from 525 to 560 outside. The EMF was 2-10 mG, and the ion counts, positive and negative, about 1000 $cm^3$.

*Aponasewicz House, California, Pennsylvania (Sept. 29-Oct.1; Dec. 2-3, 1999):*
Mrs. Laura DuBois, her husband John, and her father Edward Hendrics (not their real names) had occupied the small wooden house for two years, about two years ago. During this time, they reported unexplained footsteps, human voices, a sense of presence, apparitions, and floating orbs of light in the basement. They attributed the phenomena to a deceased couple who had occupied the home for many years and were surrogate parents to Mrs. Davis. The house was unoccupied when we visited (see Nichols & Roll, 2000, for a detailed report). We learned of the case from Dr. René Horath, professor of Industrial Engineering at the University of California (Pennsylvania) who had recorded the orbs with a Sony Night Shot video camera. Using the same type of camera, we recorded the orbs, observed them on the video monitor and directly in some instances. They would appear suddenly, move in straight or curved trajectories, slowly or fast. On one occasion when Nichols detected an orb nearby, he inserted a temperature probe and found the orb to be 78 degrees Fahrenheit, ten degrees warmer than the room. An EMF probe placed in the path of another orb recorded a field of 120 mG. The GMF in the basement was high at 760-880 mG while the GMF in the house itself was only 550-612 mG., The EMF was 2-8 mG. The positive ion density was 2,700 per $cm^3$ and the negative 2,400.

*Plenty Plantation, Port Tobacco, Maryland (Oct. 15-18, 1999):*
The $18^{th}$ century plantation house, Plenty, overlooks the countryside near the small town of Port Tobacco. It was first investigated by Roll in 1996 but without adequate instrumentation. Nocturnal knocks and human voices were reported by Mrs. Beverly Ihrig, her father (since deceased) and by previous occupants. Apparitions were reported by Mrs. Ihrig, and a collective apparition was seen by her and Alethea, her grown daughter. They were sitting in the music room when a man dressed in old-fashioned clothing walked in. He seemed solid, but had no legs below the knees. The only place Mrs. Ihrig felt fearful was on the driveway at night. Mr. Ihrig had seen a male apparition there, and their 10-year-old son, James, said that whenever he walked up the driveway, "I get this feeling that someone is going to capture me and take me away." During the earlier study, about 100 flash photos with a 35 mm Canon camera and 400 speed Kodak color film were taken in this area from the same position, one of the photos showing a cloudlike formation. Hoping to repeat the finding, Roll and Nichols took 45 flash photos with the same camera alternating with 47 digital photos; there were no anomalies.

There was an EMF burst of 125.7 mG that lasted for about 2 minutes in the sewing room on the $2^{nd}$ floor. An intense GMF of 800-900 mG in the building extended outside, dropping off to 255 mG a quarter of a mile down the hill. An extreme positive ion count of 102,000 $cm^3$ was recorded in the cellar; the negative ion count was 5,000.

*Oliver House, Bisbee, Arizona (Nov. 6-7, 1999):*
When Dennis Schranz was about to sign the papers that would make him the owner of Oliver House, he said that the seller's wife interrupted with a confession, "The house is haunted, it has five ghosts but only one of them is violent." Schranz did not believe "in these silly things," signed the papers and converted the house to a bed-and-breakfast. The house has a checkered past. There has been a murder, an unverified mass-murder, and a suicide by a former employee. It was a facility for a group of juvenile delinquents who all died in a rafting accident. Mr. Schranz has heard footsteps coming into his room, in another room he said that the sheets are sometimes thrown off the bed and a cuckoo clock emits ticking sounds although it has no working parts. Apparitions have been seen. About every other weekend, guests or employees tell of unusual happenings. .

The GMF ranged from 560 to 824 mG in the house, and was also high outside and then dropped off. The EMF was 1-3 mG. The positive ion count was extreme at 18,000 $cm^3$ in the cellar, the negative 6,400 $cm^3$. Infrared video recording of a bed with a history of unexplained movements showed no anomalies.

*Kasicki House, Florida (Aug. 16; Nov. 28, 1999):*
Since 1990, when Linda and Robert Kasicki and their daughters Dana and Leah moved into their home (built circa 1888), they have told of sounds of voices, footsteps, a strong sense of presence, "electrical" sensations, and apparitions of several males and a small girl. When Leah was 16, she felt and saw a male apparition lying on top of her. The experience made her move out. Previous occupants have also described apparitions. The family reports an increase in phenomena preceding and during thunderstorms. Nichols, who has monitored the house since 1992, uses it to instruct his parapsychology classes.

The EMF exhibited transient anomalies in excess of 100 mG and was otherwise 2-3 mG. The GMF was high at 700-800 mG within the home and 400-500 mG outside. The source of the GMF and EMF anomalies may be a seismic fault located 100 feet from the house. The fault resulted in an earthquake in 1890. The positive and negative ion densities were both moderate at about at about 1,300 per $cm^3$.

*Batzel House, Pennsylvania (Dec. 3-6, 1999):*
The Batzel case was first investigated in 1973 (Rosenberg, 1974) with two subsequent visits by Roll. The present household consists of Beth and Bob Batzel and their mothers. The basement apartment, which Lisa, the Batzel's younger daughter occupied for two years until July 1999, may be the most active area. At night Lisa said she would often hear the backdoor open and close as if her husband was returning from work, although he did not return till later. When he was away, a dark figure would walk by their bedroom door and sometimes stop and stare at her. This would happen almost every night. She felt extremely uncomfortable and moved out at the first opportunity. The family also described sounds of footsteps and human activity, apparitions, electrical disturbances, luminous phenomena, occasional object- movements, and recurrent ill health.

The GMF in the basement apartment was 706-880 mG , with somewhat lower readings on the first (770 mG) and second floor (706-729 mG). The field tapered off outside to 492-518 mG. The EMF was a normal 1-3 mG. The basement showed an extreme positive ion density of 36,000 per $cm^3$. The negative ion count was 8,000. A Sony Night Shot infrared video camera was used in three locations where apparitional and luminous phenomena had been reported but no effects were seen.

*Wyrick House, Georgia (Dec. 12-13, 1999):*
Soon after Lisa and Andy Wyrick moved to their present home in 1988, their three-and-a-half year old daughter, Heidi, met a man named Con "with blood all over" who asked her to play on his swing. Her parents thought the man wanted to hurt the child and searched the neighborhood, finding no one. Heidi then spoke of a Mr. Gordy and said they would play on his swing. Her parents now dismissed the figures as imaginary playmates until they discovered that a Mr. Gordy had lived and died in the area and that a man named Lon, who had lost a hand in an accident, had also lived and died there.

Photographs of the two men were obtained from their relatives, and Heidi's descriptions were found to match the pictures. Lisa then became pregnant, and a frightening figure appeared to Heidi. After Jordan was born, Heidi woke up with scratches on her cheek and similar scratches appeared on Andy's body on four successive nights. The family asked Roll to make an investigation.

When the family reported an escalation of the phenomena in 1999, another investigation was made. Jordan had seen an apparition of a girl, Lisa had been frightened at night by incomprehensible voices, and a visitor who slept in Heidi's room felt pressed down by an invisible presence. The GMF in the home was a

moderate 515-563 mG and the EMF was 1-10 mG. The only anomaly was an extreme positive ion density of 15,000 $cm^3$ in Heidi's room.

## Discussion

We expected anomalous magnetic fields at the 12 sites we visited. This expectation was fulfilled at ten sites (see Table 1). At three (Dragsholm, Plenty, and Kasicki) there were intense, transient EMF increases. At one of these (Dragsholm) the anomaly was attended by a drop in temperature and an apparitional sighting. At one site (Johnson) an intense and constant EMF overlapped with an intense GMF. The remaining eight sites showed normal EMFs (except in proximity to electrical installations).

If a GMF of 500 mG is considered normal for the U.S. and 600 mG for areas in the north, there were six sites that exceeded the norm by 200 mG or more (Johnson, Aponasewicz, Plenty, Oliver, Kasicki, and Batzel). Four of the sites (Johnson, Aponasewicz, Plenty, and Batzel) showed intense EMFs as well as intense GMFs. Except for three sites (Dragsholm, Haney, and Wyrick) there were differences in the intensities of the GMFs that might be expected to affect the occupants as they moved about. At two sites (Haney and Wyrick) the EMFs and GMFs were close to normal. Ion densities above 2,000 $cm^3$ were detected at seven sites (Engsö, McRaven, Johnson, Plenty, Oliver, Batzel, and Wyrick). At two of these (Batzel and Wyrick) there were extreme positive ion densities in occupied areas of the home that may have had a negative effect on the occupants; in two others (Plenty and Oliver), the extreme positive counts were limited to unoccupied cellars. Three of the sites (Ft. Leonard Wood, McRaven, and Aponasewicz) generated distinct photographic anomalies, presumably showing electroforms.

Most of the haunt phenomena could be accounted for in terms of the physical energies recorded at the sites. With the exception of the Haney House, apparitions were reported in all cases. This phenomenon may be elicited when magnetic fields are applied to the right temporal lobe. The same is true for the sense of „presence" mentioned by the Aponasewicz and Kasicki families. Sleep paralysis and the attendant fear, which disturbed the family at Fort Leonard Wood and the Kasicki's can also be attributed to magnetic fields. The same is true for the depression and aggression that affected the Fort Leonard Wood family and the Johnson's. The tactile sensations described by the wife at Fort Leonard Wood, may result from piloerection, electrostatic fields or direct electric stimulation of the brain. The electric disturbances mentioned by the same family and by the Batzel's may result from the magneto-restrictive process. This process may have ruined the heating elements in the Haney's fish aquariums and affected the heating duct in the basement, resulting in the sound of "footsteps" in the hallway above. Magneto-restriction, or direct electric stimulation of the auditory cortex, may have caused the footsteps, sounds of voices, and other acoustic phenomena described by the family at Plenty, the Johnson's, the Aponasewicz's, the occupants of Oliver House, the Kasicki's, and the Batzel's. The cold spots and fires reported by the Johnsons may be Peltier effects. The "ghost lights" and other photographic effects at Fort Leonard Wood, McRaven House and the Aponasewicz House were probably piezoelectric effects. At Fort Leonard Wood, the dogs may have been alerted by ultrasounds or electric stimulation of the hippocampus and amygdala. The movements of doors at Dragsholm and the Johnson home may be due to magneto-restriction on the ferrite components. The seeming "apports" and "teleportation" may be due to automatic behavior and amnesia induced by the anomalous magnetic field. If the disappearance and reappearance of object took place as described, this would be beyond known energetic processes. The Johnson's described movements of stationary objects in proximity to Mrs. Johnson. These may have been RSPK, perhaps facilitated by the intense magnetic fields in the home.

Some haunts may be dangerous to the health of human and animal occupants, not because of ghosts but because of the conditions that produce ghosts. Because of the role of the amygdala and the insula in the regulation of heart synchronization, electrical disruptions in the these regions by specifically timed electrical currents coupled to the normal feedback from the heart into the brain can produce cardiac aperiodicity and sudden death.

Other haunts may be beneficial. Speaking of McRaven, Mr. French said it is a "wonderful experience to work here...like a family," an impression verified by the tour guides and the re-enactment actors. At McRaven the positive ion density was 1,500-1,900 $cm^3$, the negative about twice as much at 3,000-3,700, which may have contributed to the good feelings.

Except for the movement of stationary objects, which may be RSPK, most of the phenomena could be understood in terms of known physical processes. A notable exception was the description by Heidi Wyrick of two deceased individuals she apparently could not have known about. In general haunts provide little evidence for survival after death. This has been noted by Gauld and Cornell (1979) and by Alvarado and Zingrone (1995). Apparitions in haunted houses may say more about the living occupants than about the departed. At Engsö, Countess Piper had a special affinity for Brita Bååth and may have seen her apparition for this reason. Moody, on the other hand, who was exploring mirror gazing as way to evoke apparitions, described a luminous presence which emerged from a mirror. Their experiences were distinct but may have been evoked by the same GMF anomaly.

The most dramatic identification of an apparition occurred during a hypnosis session when Ms. Johnson recognized an apparition as a (living) relative who had molested her as a child (she has examined this and the other haunt phenomena in *The People in the Attic,* St. Martin's Press, 1995).For Heidi Wyrick the character of her apparitions changed with the family situation. When her mother became pregnant, the friendly Mr. Gordy gave way to a threatening figure, and when her sister was born, Heidi and her father received strange scratches at night. The lesions on Heidi might have been self-inflicted, but her father's were more difficult to dismiss. The parents told Roll that Heidi was jealous of her baby sister and angry at her father for paying so much attention to her. It seemed that Heidi's lesions and negative apparitions may have reflected guilt about her feelings of jealousy, and that the scratches on her father may have reflected her anger at his attention to the newcomer. It may also be important that there was an extreme positive ion density in Heidi's room (we recommended that an air-purifier with a negative ion generator be installed ). In any case, the threatening apparitions did not return after Roll had spoken to Heidi about her feelings.

In future studies of haunts, the measurements of physical energies should be complemented by monitoring the physiological condition of the occupants. This can be done at the site with existing instruments, including measurements of the electrocardiogram, the electromyogram, the electro-encephalogram, and electro-dermal responses. It seems clear that energetic fields at haunt have an impact on the mental health of those present and probably on their physical health as well. Haunt sites provide a natural laboratory for exploring health related issues that may exist not only in places believed to be "haunted" but in other human habitats and natural locations as well.

Table 1
GEOMAGNETIC, ELECTROMAGNETIC AND ION MEASUREMENTS AT TWELVE HAUNT SITES

| Cases | Collection date | GMF (mG) A =Ambient T =Transient L = Localized | EMF (mG) A =Ambient T =Transient L = Localized | ION ($CM^3$)* + = Positive Ion Count - = Negative Ion Count |
|---|---|---|---|---|
| Dragsholm Castle Denmark | Feb. 13-15, 1999 | A =557, T = N/A, L =N/A | A = 2-5, T = 100, L = N/A | + ≤ 1000 - ≤ 1000 |
| Engsö Castle Sweden | Feb. 17-19, 1999 April 10-11, 2000 | A = 650, T = N/A, L = 752 | A = 2-3, T = N/A, L = N/A | + = 1,750 - = 2,200 |
| Ft. Leonard Wood Missouri, USA | Mar. 12-15, 1999 | A = 562, T = N/A, L = 28 | A = 1.5-3.5, T + N/A, L =N/A | + ≤ 1,000 - ≤ 1,000 |
| McRaven House Mississippi, USA | May 28-31, 1999 | A = 350, T =N/A, L = 450 | A = 3-8, T = 48**, L =N/A | + = 1,500-1,900 - = 3,000-3,700 |
| Johnson House Indiana, USA | June 28-30, 1999 | A = 515-527, T =N/A, L = 725-847 | A = 126-157, T =N/A, L = N/A | + = 5,000 - = 17,000 |
| Haney House N. Carolina USA | July 17-18, 1999 | A = 525-560, T =N/A, L = 540-616 | A = 2-10, T =N/A, L = N/A | + ≤ 1,000 - ≤ 1,000 |
| Aponasewicz House Pennsylvania, USA | Sept. 29-Oct. 1, & Dec. 2-3, 1999 | A = 550-612, T =N/A, L = 760-880 | A = 2-8, T =120, L = N/A | + = 2,700 - = 2,400 |
| Plenty Plantation Maryland, USA | Oct. 15-18 1999 | A = 225, T =N/A, L = 800-900 | A = 1-3, T =125.7, L = N/A | + = 102,000 - = 5,000 |
| Oliver House Arizona, USA | Nov. 6-7, 1999 | A =560, T =N/A, L = 824 | A = 1-3, T =N/A, L = N/A | + = 18,000 - = 6,400 |
| Kasicki House Florida, USA | Nov. 21-22 1999 | A =400-500, T =N/A, L = 700-800 | A =2-3, T =100, L = N/A | + = 1,300 - = 1,300 |
| Batzel House Pennsylvania, USA | Dec. 3-6. 1999 | A =492-518, T = N/A, L = 706-880 | A =1-3, T =N/A, L = N/A | + = 36,000 - = 8,000 |
| Wyrick House Georgia, USA | Dec. 12-13, 1999 | A =515-563, T = N/A, L = N/A | A = 1-10, T = N/A, L = N/A | + = 15,000 - = 1,100 |

* Positive Ion measurements were made at the lowest level of each structure, which accounts for some of the extreme values.

** Obtained during photographic testing outside of the house.

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# RELIABILITY AND CORRELATIONS OF PK PERFORMANCE IN A MULTIVARIATE EXPERIMENT

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The reliability of measurements is a basic concept in empirical research. Theories and methods for determining reliability have been developed in psychology within the context of classical test theory (CTT). The present paper suggests that these methods should be applied also to correlational and experimental parapsychological studies. Using the example of a multivariate PK experiment, we will demonstrate how results can be interpreted more precisely if the reliability of PK performance is taken into consideration.

Until now, the question of reliability of psi measurements has been widely neglected in parapsychological research. Reliability coefficients for psi performance are published only rarely. According to Palmer's (1977) estimate, a mean but highly variable reliability of .30 can be expected for performance in ESP tests. However, this estimate seems rather optimistic given the few experiments and small sample sizes involved. A few other studies with moderate sample sizes show reliabilities of .10. In an early dice experiment with 54 participants (Dale, 1946) a split -half reliability of .46 is reported[1].

Reliability is defined as the ratio of the true score variance of a measurement to its total score variance and can be estimated only by repeated measurements. In psychological research, for example, responses to items of a scale can be understood as repeated measurements. The corresponding terms in psi experiments are usually trials and runs. In both cases total scores or mean scores respectively are calculated. This procedure assumes that total scores or mean scores are better estimates than single measurements. However, this holds only if single measurements are correlated with each other. Here combined scores enhance the true variance whereas the uncorrelated error variance will be reduced. Otherwise combining the scores may hide possibly meaningful information. If basic conditions are violated such as assumption of a relative stable effect and of its lack of correlation to error variance, then misleading or even apparently impossible results such as a negative reliability may result.

The most frequent method for determining a scale's reliability is Cronbach's $\alpha$. This coefficient represents the internal consistency of a scale which can also be interpreted as the correlation of the scale with itself. Ultimately one is testing whether all items forming a scale fit together.

In constructing random event generators (REGs) for PK experiments, the single random events must be independent of each other. Thus, under the null hypothesis, single REG events as well as aggregated scores should be completely uncorrelated. If results or scores from REG data gained under experimental conditions show an internal consistency that significantly differs from zero, this could be understood as an indication of a psi effect.

However, it is not desirable to look for correlations between psychological variables and psi performance without considering the internal consistency of psi performance. It is almost impossible to decide whether a significant correlation is substantial or artificial when internal consistency is unknown. Moreover, if a correlation does not reach significance, the reasons for that non-significance remain obscure. It could either be explained by an unfavorable choice of one or more psychological variables or by the unreliability of the psi variable.

[1] We would like to thank to an unknown referee for this information

The present experiment formed part of an attempt to replicate the PEAR REG results (Jahn et al. 1997). One aim was to examine correlations between attitudes, personality characteristics and PK performance. 102 participants, recruited through advertisements, filled out eight computerized questionnaires on their first visit to the Institute. These questionnaires assessed 25 different psychological variables. Each participant took part in three experimental sessions with only one session a day.

Briefly, the technical details of the experiment are: 200 Bits form one trial. 100 consecutive trials form one run. Participants got within runs graphical feedback (random walk). A session consisted of ten high, ten baseline and ten low condition runs. Before each run participants chose the direction of the next run. Only the results from high and low condition runs are mentioned in this paper. Overall no significant mean shift was found (deviation: -4128, $p = .23$). The same holds for separately collected control data.

Firstly, scales for two revised questionnaires were established by means of factor analyses and item analyses. A factor analysis (i.e., PCA) on all used scales yielded 4 factors. From each of the factors a high loading variable (neuroticism, telegen absorption scale, paranormal belief, extraversion) was selected to predict success at the first session. In addition, three further scales (schizotypal personality, creativity, and volitional competence) were selected whose variance could be explained only insufficiently by the PCA. However, the multiple correlation of these 7 scales did not reach statistical significance (R = .18, F = .251); the same also applies to the beta weights of individual variables.

Subsequently, the correlations between all psychological variables and the experimental results were calculated post hoc for each of the three sessions. Three significant correlations ($p < .05$, two-tailed) with PK performance were found, but only in the third session: Sheep-Goat $r = -.217$, mental training $r = -.209$, and sociability $r = -.196$.

Furthermore Cronbach's alphas for PK performance were computed separately for each of the three sessions. The 20 relevant run scores were included in the reliability analysis in the order of their appearance. The results were: $\alpha_1 = .082$, $\alpha_2 = -.012$, $\alpha_3 = .031$. None of the three coefficients reached statistical significance (e.g. $\alpha_1$: $t_1 = .823$; df = 100, $p = .21$, one-tailed). Thus, in this experiment a reliability analysis did not show any evidence for a PK effect.

By correlating of the PK results across the three sessions the temporal stability of the scores (retest reliability) could be assessed. Of the three correlations, ($r_{1,2} = .269$, $r_{1,3} = -.045$, $r_{2,3} = .092$) only that between the first and the second session was significant ($p = .003$, one-tailed). This result is hard to explain. However, considering the lack of internal consistency in the PK results ($\alpha_1$, $\alpha_2$) the significant correlation may be a fluke. This assumption is concordant with CTT, which suggests that the retest reliability of a variable (e.g. $r_{1,2}$) cannot be greater than its internal consistency.

The significant correlations of the PK variable with the psychological variables must also be rejected because of the low internal consistency in the third session. The maximum correlation between two variables equals the geometric mean of their reliabilities. Correlations with $r >= .1946$ (two-tailed, n = 102) are significant. With an internal consistency of $\alpha_3 = .031$, a correlation coefficient of $r >= .1946$ cannot be reached, even when the reliability of the psychological variables is set to 1.

In this experiment, the attempt to demonstrate a possible PK effect through a correlational approach did not succeed because of the low internal consistency of the PK variable. The oft-cited elusiveness and low replicability of psi effects may reflect in an informal manner the lack of reliability of psi variables. We suggest to test the reliability of psi measurements on a regular basis. This seems to be of particular importance for correlational studies, where this procedure could also help in identifying instances of Type I errors.

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# ALTERNATIVE WAYS OF CONTROL IN PARAPSYCHOLOGICAL RESEARCH

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In his P. A. Presidential address, K. R. Rao (1989), pointed to "possibility that our testing procedures themselves may be psi-inhibitory and that they may mask or filter out psi to the point of effectively reducing it to a trickle that we can afford to ignore" (p. 5). Rao refers to the precautions against bias and fraud commonly taken in laboratories. Participants are separated from experimenters and targets by screens and rooms, put in Faraday cages etc., and such over-suspiciousness is likely to block a participant's psi. In a similar vein, Bierman and Gerding (1992) plead for a "reduction of experimenter control [at least] in the study of special subjects. "An alternative approach is advocated where 'sloppy' conditions are allowed...[because] even with moderate experimenter control decisive conclusions might be drawn for the majority of the possible outcomes" (p. 1).

The present approach pleads for a more radical change along the lines that Bierman and Gerding proposed as mere exceptions. Loose experimental conditions, home tests without any control, are advocated as the *testing norm*. Are psi-enhancing conditions optimised here at the expense of control? Not at all, effects of bias/fraud, if not excluded, might be detected after data collection, just as Tour de France cyclists may be subjected to doping tests *after* their daily competitions. Common *precautionary* control in psi research is largely replaced with *"postcautionary"* control.

## THE PINGPONG BALL TEST

The task resembles searching in one's trouser pocket for a particular key amongst irrelevant others. Pingpong balls are used instead of keys, an opaque bag instead of a pocket. Participants are instructed individually to draw, blind, any one of 50 balls from the bag, the numbers 1 to 5 are written on them, each number on 10 balls. For each trial participants guess and note the number they will draw next and also note afterwards the number actually drawn. Participants shake the bag prior to drawing a ball. After each draw the ball is put back into the bag. A participant does two or three trials in the experimenter's presence, then takes home the bag with the balls, written instructions and answer sheets, performs six runs (each run 60 draws) at leisure alone and, about one week later, returns the material and completed answer sheets to the experimenter.

## A PRIORI CONSIDERATIONS

No doubt, fraudulent actions of participants, when drawing pingpong balls at home, are conceivable and possible. Are they probable? Not too probable, in the first place. Participants generally wish to know whether they have psi-ability or not, they could not, by trickery, satisfy this personal need. In addition, secret trickery requires caution and more time than honest test behaviour, a payoff for this considerable extra effort is hard to conceive. Third, if psychology freshmen (the majority of our participants) forged their data, they would have to consider that their misconduct might be discovered, and thus risk their reputation. (The test instruction refers to possibly discovering, by computerised analysis, dishonest data treatment). Fourth, participants are told in advance that high scorers might be invited to take part under

laboratory control. Participants who might want to tamper their data at home, for whatever reason, would have to consider detection later. Home data of high scorers who refused testing under stricter conditions (no one ever refused) would not be considered as trustworthy (unless other postcautionary measures revealed psi effects, see below).

## THE ALTERNATIVE: POST-CAUTIONARY CONTROL

Aside from *a priori* conditions and *precautionary* measures contributing to the trustworthiness of test results more extreme demands for safety can be met by taking measures of *postcautionary* control. Suspicion of data tampering or unintended bias is reasonably cast, in the first place, on high scorers. Suggested measures of postcautionary control are as follows:

- *(1) Try to locate in data of high scorers signs of unintended deviations from chance,* i.e. deviations of *variables* which are independent of the hit variable, not attended to under ordinary test conditions, hard to manipulate, even perhaps not noticeable at all. Highly significant deviations from chance of such variables cannot reasonably be explained by fraud or unconscious wishful actions. Rhine repeatedly drew attention to them as „quirks", „psi-peculiarities", „incidental evidence of psi" or „earmark proof of psi" (Rhine 1975). If psi-indicating peculiarities are present in data of high hit scorers, their *hit deviations*, following Occam's Razor, may also be attributed to psi.
- *(2) Analyse data of high scorers by subjecting them to a fraud-detector program.* This program is as follows. Chance scorers are invited to continue the ball test at home and to tamper their data such that the experimenter would gain the impression that they had paranormal ability. They are warned, however, that a computer program might discover their fudging, they should therefore try to escape the program's sensitive algorithms. The data, fudged by instruction, are then compared with data obtained from participants not having received the fudging instructions. Results so far are encouraging. Of seven participants receiving fudging instruction six showed peculiarities which greatly differ from those of high scorers without fudging instruction.
- *(3) Invite participants scoring high under home conditions to continue the ball test under laboratory conditions (see above).*

## EMPIRICAL EVIDENCE (EXAMPLES)

Two of the highest-scoring participants have been tested under my control. Katarina`s scores across 16 runs were extremely significant (see Figure 1). I invited Katarina to continue the test at my office, her score dropped (stage fright apparently), but gradually recovered during subsequent eight runs under my control. Since her scores at my office are honest without doubt, her home scores need not be suspected of dishonesty either.

An unselected sample of N=151 students shows, under standard test condition, a slight tendency to make "good errors," e.g., if the target 1 is missed, the number 2 is more likely to be drawn than numbers 3, etc. Figure 2 shows "good errors" of four subjects under standard condition (low proportion) and under special conditions (high proportion). Kannan was told to guess high numbers and to consider "good errors" (e.g., drawing 4 instead of target 5) as advantageous. Katarina was told to draw the numbers of immediately preceding draws. Barbara and Oliver, a couple, were told to co-operate, the partner was to guess the other partner's subsequent draw. Kannan's preference for "good errors" makes sense, for him they were second choice. But for the others "good errors" were irrelevant, they did not even notice their own preference among errors - an unintended and unattended "earmark of psi".

Sina's six screening runs showed significant psi-missing (see Figure 3, the circles show successive cumulations of results using the PEAR-type presentation). Sina also shows, after six runs, a significant tendency to draw runs of same numbers (see triangles). She continued the ball test for an additional 16 runs. It can be seen that her psi-missing tendency kept its significance level, while her tendency to immediately repeat the same draws gradually reversed to the point of avoiding to draw successively same numbers. The reason might be that Sina had become aware of this peculiarity by the 6th run and liked to see its replication. So both her desire (from the beginning) to obtain hits and her desire (upcoming later) to replicate number repetitions resulted in undesired reversals.

Figure 1

COUNT OF HITS ACROSS 24 RUNS OF PARTICIPANT KATARINA

Home testing condition (nos. 1-16) and laboratory condition (under an experimenter's control). Two-bag procedure, simultaneous right and left hand trials (60+60=120) , MCA=24

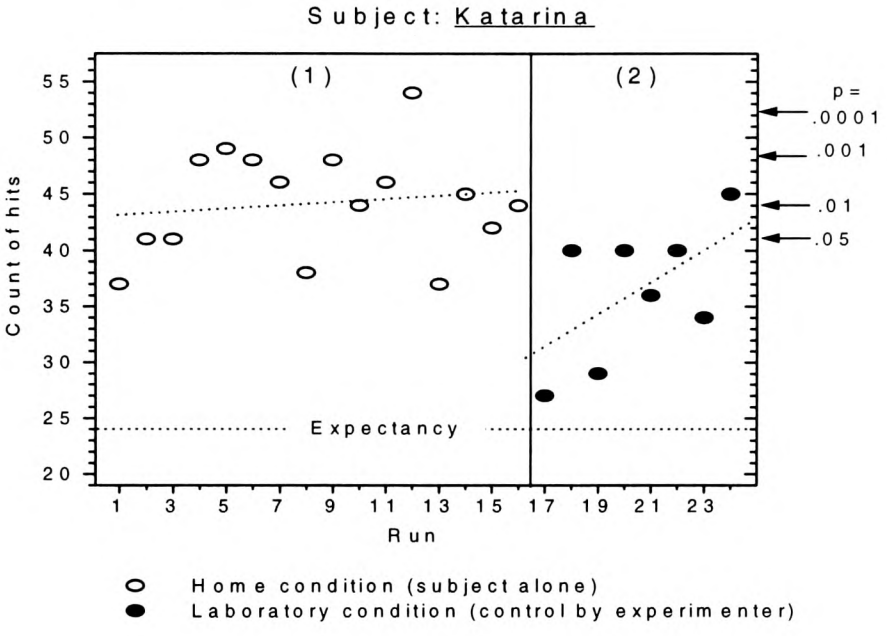
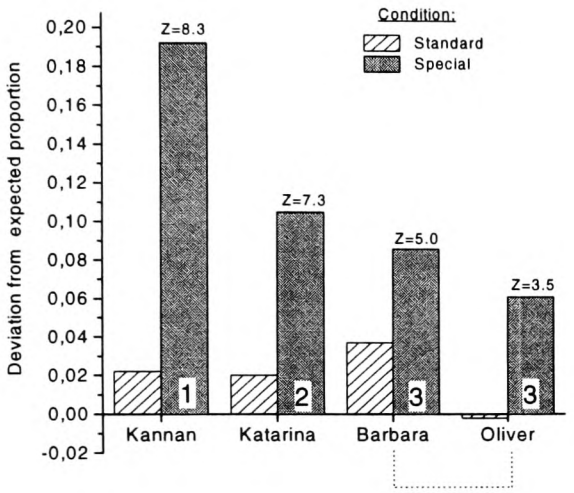


Figure 2

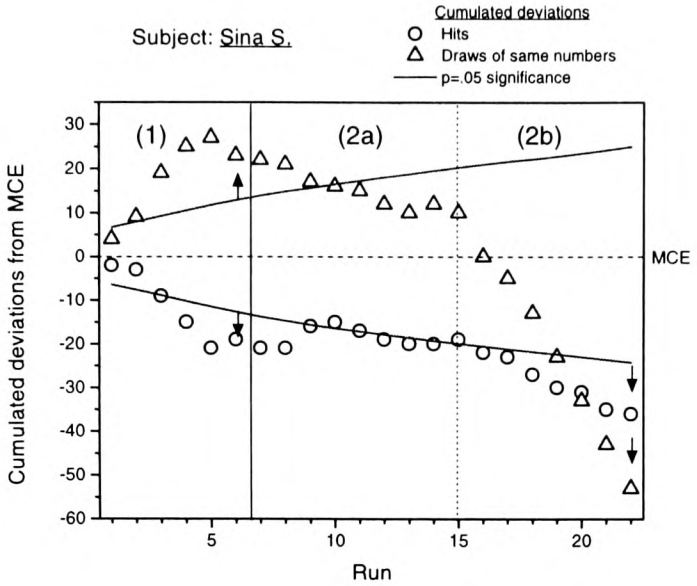
ALMOST-HITS (DEVIATIONS FROM EXPECTED PROPORTION) OF FOUR PSI-TALENTED PARTICIPANTS, UNDER STANDARD AND SPECIAL TESTING CONDITIONS




Special instructions:
(1) Draw large / small numbers
(2) Draw the just-drawn number again
(3) Draw the number predicted by your partner

Figure 3

CUMULATED DEVIATIONS FROM MCE OF HITS (CIRCLES) AND IMMEDIATE REPETITIONS OF DRAWN NUMBERS (TRIANGLES) OF PARTICIPANT SINA*.




*Immediate repetitions are not hit-dependent

## IN PASSING

Other possible sources of bias (not shaking balls sufficiently, reading and noting wrong numbers) have been investigated with comforting results. Sensory leakage, conceivable because balls and script are touched, is deemed impossible according to results of research on *dermo-optical vision* (Makous, 1966). Theoretically, the present strategy can best be backed by Stanford's *PMIR model* (Psi-Mediated Instrumental Response, 1977), by Rao`s (1993) model of *sensory-extrasensory fusion,* and by Batcheldor's (1994) *UCP model* (Universal Creativity Principle).

## CONCLUSION

An analysis of data of extremely high (or low) scoring participants individually is fruitful, more so than an analysis of a database of unselected subjects. If high scorers under home conditions maintain their scores under control, if they display significant peculiarities including unwanted hit and other scores (reversals), the question of honesty, for them, is resolved. In view of safe conclusions about the functioning of psi with highly suspicious (i.e., extremely high scoring) individuals, the question of honesty becomes less urgent with less talented subjects. The pingpong test results of N=151 unselected psychology freshmen, yielding significant deviations from chance (Z= 9.1, $p=10^{-16}$, ES =.527 (Rosenthal&Rubin, 1989)), may therefore be taken with trust. One might eventually forfeit much of that unnatural concern impeding parapsychological research ever since its beginning. By abandoning the methodological dogma of excluding, prior to conducting a test, at all costs (i.e. even at the cost of psi-conducive conditions) even the oddest possibilities of fraud, researchers of the paranormal might eventually become normal.

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# BRAIN SOURCES OF EEG GAMMA FREQUENCY DIFFER BETWEEN VARIOUS MEDITATION-INDUCED, ALTERED STATES OF CONSCIOUSNESS

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Altered states of consciousness such as in meditation, hypnosis, and hypnagogic and dream states are hypothesized to be conducive to psi experiences (Honorton, 1977). Different approaches can be used for meditation, hypothetically leading to a putatively common final state. Thus, knowledge about the physiology of different meditation approaches (e.g. Hebert & Lehmann, 1977) might clarify the disposition for psi.

A particular feature of brain electric activity, the 40-Hz or 'gamma' frequency band recently has been focused as a crucial brain mechanism for the implementation of higher brain functions, in particular of consciousness (see Singer et al. 1997).

Studying a very experienced meditator, we examined brain physiological characteristics during different meditation approaches, more specifically the brain spatial distribution of gamma EEG frequency band activity. Multi-(27)-channel scalp EEG was recorded during different, repeated meditations. Two sequential sessions were analyzed during which five meditations, 2 minutes each, were performed in identical sequence. Data of one meditation were lost from the first sequence, so that 4 repeated meditation approaches remained for EEG analysis: (1) 'Buddha in front of me'; (2) a 100-syllable Mantra; (3) 'Dissolving' [German: '*Verschmelzen*']; (4) 'Regeneration' [German: '*Widererstehen*']. The meditator described meditation (1) as a visualization, (2) as a silent recitation, and (3) and (4) as naturally sequential, inseparable changes of self-experience.

From the scalp EEG data of each meditation approach, the intracerebral location of the source gravity center of the EEG "gamma" frequency band (35-44 Hz) was computed using single source modeling in the frequency domain (the 'FFT-Dipole-Approximation' method, Lehmann & Michel 1990). The method results in the three-dimensional brain location of the center of gravity of all nerve cells that were active within the chosen frequency during the analysis time. This location must not be misinterpreted as describing a single point generator, but as assessing the center of gravity of a distributed population of generators. (It is generally assumed that higher brain functions involve widely distributed processes, e.g. Mesulam, 1990).

The gamma band gravity center differed significantly between the meditations (MANOVA $p<0.001$). Post-hoc tests showed: the gravity center was more posterior during meditation 1 ('Buddha in front of me', visualizing) than during meditations 2 ('100-syllable-mantra', verbalizing), 3 and 4; the gravity center was more left during meditation 2 (verbalizing) than during meditations 1 (visualizing), 3 and 4; and the gravity center was more inferior during meditation 1 (visualizing) than during meditations 2 (verbalizing), 3 and 4, and more inferior during meditations 3 and 4 than during meditation 2 (verbalizing). It is important to note that all location differences had the same direction in both sequences of meditations.

Within the conceptual framework that EEG gamma band activity plays a crucial role in the execution of consciousness- or attention-associated functions, our gravity center findings during the visualizing

meditation (1), 'Buddha in front of me', indeed support visual imagery functions. The gamma band gravity center in this meditation was most posterior and most to the right compared with the other three meditations that obviously involved a lesser degree of visualization. The present results are in agreement with other reports that indicated right posterior activation as brain state of spontaneous visual imagery (Lehmann et al. 1998).

The 100-syllable mantra on the other hand involved verbalizing and/or auditory experience. In agreement with the generally known left-sided, anterior and temporal brain functional topography of active language functions, the gamma band gravity center during this meditation was more to the left than in the other three meditations, and more anterior than in the visualizing meditation (1).

The meditations 'Dissolving' and 'Regeneration' had gamma band gravity center locations that were not significantly different. We note that the meditator had stated that these two meditations actually form a whole since the later one naturally emerges from the preceding one, and that a sequence reversal is not possible, even though they were experienced as subjectively different. We also note that compared with the other two meditations, their gravity centers were more right than for the 100-syllable mantra meditation and more anterior than for the visualizing meditation (1). The more right-sided gravity center of conceivably non-visualizing meditations may be related to the putatively more holistic nature of processing in the brain's right hemisphere.

Thus, during three of the self-initiated, meditation-related, altered states of consciousness that were associated with different subjective experiences, and without systematic input of external origin, clearly different brain neuronal populations could be distinguished that were active in the gamma EEG frequency band. Given that meditation states are psi conducive, our data would suggest that there are physiologically different pathways to psi conducive states.

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# DREAMS AND DÉJÀ VU

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## DREAM-RELATED EXPLANATIONS OF DÉJÀ VU

Three dream-related hypotheses that have been put forward over the years to explain déjà vu experiences. The first says that the person has dreamt something *similar* to what has already occurred and his or her mind then makes an association between these. At least six authors have put forward this notion: Jessen (1855), Kraepelin (1887), Guyau (1890), Ellis (1897), Störrig (1900) and Dwelschauvers (1916). The last investigator suggested that several sources probably generate déjà vu experiences and dreams with similar elements may be just one of them. The second hypothesis is that the association with dreams is just a trick of the memory: one has the impression one has lived through an event or seen a place in a dream, but in reality the impression is illusory and the purported memory of the dream is bogus (Hodgson, 1865; Sander, 1874).

The third hypothesis is that precognitive dreams are the source of many déjà vu experiences (termed "promnesia" by Myers, 1895) (Funkhouser, 1983). Three subtypes of this explanation can be distinguished (Schafton, in print):

1. The individual cannot specifically remember the dream, but is convinced that the source for what he or she is experiencing came from a dream from some time in the past.
2. The preview dream was remembered on waking, and possibly even written down, but was subsequently forgotten until the "triggering" event occurred or place was visited.
3.The precognitive dream is not remembered until the déjà event takes place.

It is very difficult, of course, to distinguish accounts stemming from subtype 1 from the second hypothesis given above, and we have only the word of the experiencer and the firmness of his or her conviction as the deciding factor. Subtype 2 is distinguished from "ordinary" precognitive dreams by the fact that the dream was subsequently forgotten as well as by the intensity of the déjà vu feeling.

Many investigators have maintained that precognitive dreams are the precursors for déjà vu experiences (cf. Funkhouser, 1983). Of those, many provide accounts of their experiences or those of others. In a 1973 article, White mentions that Carrington (1931) put forward a theory that out-of-the-body experiences could be an explanation for what might best be termed "déjà visité" (Funkhouser, 1995). She also says that Dr. Louisa Rhine of Duke University felt that either that or precognitive dreams were the source of déjà vu experiences. White goes on to say that "the most commonly offered parapsychic explanation for deja vu [sic] is the precognitive dream".

Shafton (in press) has investigated dreams and dreaming among American Blacks. He devotes a chapter in his book to the relation between predictive dreams and déjà vu. He found that whereas his white subjects favored neurological and reincarnation explanations, the largest proportion of his black interviewees (57%, n = 116) favored the predictive dream hypothesis, while the reincarnation theory "came in a poor second". One of the individuals he interviewed said he was sure experiences in past lives influenced the precognitive dreams he had but could not remember. One woman said "that after déjà vu she can go back and locate old preview dreams recorded in her journals as much as twenty years earlier" (p. 111).

## RESEARCH USING THE INTERNET

*http://www.dejanews.com* was employed to query the alt.dreams and alt.dreams.lucid news groups on the UseNet. By entering déjà vu as the key words, 48 people were found who, between May 13, 1996, and April 26, 1997, spontaneously wrote to tell about the déjà vu experiences they had had and/or to offer explanations for how such an experience can arise. Compiling the results, 32 (67%) favored precognitive dreams as the most likely explanation for déjà vu, while the others were evenly split, offering either some other explanation (8) or none at all (8). It should be emphasized that this is a self-selected sample representing only people interested in dreams and with internet access, and may thus not be representative of the general population.

A few reported experiencing déjà vu in their dreams: they said they would recognize in the dream that they had dreamt the same action before or been in the same place, a dream experience which could be termed "déjà rêve" (Neppe, 1983, p. 10). Such a survey could easily be extended to include reports from several more years.

## SUGGESTIONS FOR FURTHER RESEARCH

There is much that isn't known about déjà vu in its various forms. It can be safely said that, with the exception of investigations concerned with temporal lobe epilepsy, amazingly little research has been done on such an uncanny phenomenon which is experienced so broadly. It would be interesting, for example, to know the incidence of the four subtypes that Neppe proposed in the general population, not to mention the 20 various forms he listed in his 1983 book. At this point, for example, neither the interpersonal nor the intrapersonal frequencies of déjà vécu and déjà visité are known, to mention only two prominent forms of déjà experience.

While surveys have shown that déjà vu tends to be more frequent and more intense among young people (Chapman & Mensh, 1951-52; Richardson & Winokur, 1967), the age distribution has yet to be broadly established. Early notions that the propensity to have déjà vu experiences might be correlated with mental illness, fatigue or anxiety have not been substantiated thus far. Studies have indicated that some connection may exist between having déjà vu experiences and being intelligent, as well as being widely traveled, but these relationships are also not certain.

At this point, no investigation has been made into a possible correlation between a predisposition for having déjà vu experiences and Jung's psychological types nor Hartmann's Boundary score (Hartmann, 1991). Possible racial determinants for such a propensity have also never been adequately studied. For example, although a Japanese word for déjà vu exists ("Kishikan"), the incidence of déjà vu among the general Japanese population is not yet known. Several scholars (East-West Institute, San Francisco, private communication) have stated that there is no mention of an experience like déjà vu in the Indian Vedas or Upanishads (which can be viewed as ancient psychological treatises) leading one to wonder if such occurrences are relatively new or not even generally experienced by people in India.

If it proves possible to obtain precognitive elements in dreams that occur in laboratory settings, it will be fascinating to know if one part of the night is more commonly yields such elements than do other parts of the sleep cycle. Dreams from the early part of the night are normally less well remembered by most people, for example, and any precognitive elements or scenes from such dreams would thus seem more likely to produce subsequent déjà vu experiences than precognitive dreams occurring towards the end of sleep. It would also be interesting to see if the inverse exponential relationship that Orme (1974) and Sondow (1988) obtained between the precognitive dream elements and subsequent fulfillment holds true in broader-based

studies and especially with déjà vu experiences. (Here again one would be forced to rely on subjective impressions since remembered dreams, even if precognitive, do not normally produce feelings of déjà vu.)

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# TRANSPERSONAL AND PSI-RELATED DREAMS: A CROSS-CULTURAL STUDY

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The purpose of this study was to investigate the incidence of selected categories of transpersonal (including psi-related) dreams from a large sample of dream reports. Transpersonal dreaming and waking experiences can be defined as those in which one's sense of identity appears to extend beyond its ordinary limits to encompass wider, broader, or deeper aspects of humanity, life, and/or the cosmos. While psi-related dreams, involving purportedly paranormal transmission of information, constituted the major focus of this study, other dream reports with transpersonal content were included in the analysis.

## PARTICIPANTS AND PROCEDURES

The research participants for this study were members of dream seminars that the senior author (SK) conducted between 1990 and 1998. These events were held in various parts of Argentina, Brazil, Russia, Japan, Ukraine, and the United States. The seminars did not focus on transpersonal or psi-related dreams, but on practical uses of dreams in daily problem-solving and life decisions. Consequently, paranormal dreams were not discussed in the seminars but only as part of the question periods, after the dream reports had been written down and handed in. Only one dream from each of the research participants was utilized. There were 212 dream reports from Argentina, 239 from Brazil, 136 from Japan, 245 from Russia, 204 from Ukraine, and 630 from the United States. The total number of dreams collected for analysis was 1,666; of these, 910 were from women and 756 of them were from men. Hall and Van de Castle obtained 5 dreams from each of their 200 research participants in an attempt to counter selectivity. It was not possible to follow this practice in the current investigation, and so the possibility of selectivity is a serious limitation of this study.

This study was delimited to several types of transpersonal and psi-related dreams from the broader categories of "exotic" dreams discussed by Krippner and de Carvalho in their book by the same name. These categories were determined independently of the seminars and were applied to the dreams after they had been collected.

No attempt was made by the authors to determine whether a purported clairvoyant dream actually matched the event in waking life about which the dreamer claimed to dream. No attempt was made to verify precognitive or telepathic dreams. These attempts have been made under controlled conditions, but were considered beyond the scope of this study.

For a dream report to be scored as a *transpersonal identification* dream, it needed to incorporate transpersonal types of imagery, such as communication and/or identification with other beings, e.g., the elements, animals, plants, deities, or identification with another person. For a *lucid dream*, the dream report had to specifically state that the dreamer was aware that he or she was dreaming before awakening from the dream. For *a dream within a dream*, the report mentioned entering a different state of consciousness within the dream itself, or appearing to wake up from the dream only to discover that the dream was still going on. For an *out-of-body dream*, the dreamer needed to report the sensation of leaving his or her body while the dream was going on. For a *telepathic dream*, the dreamer had to claim that a dream matched the mental content of a distant person in external reality and that the purported match was confirmed sometime after

the dreamer awoke. For a report to be scored as a *shared dream*, the dreamer and someone else claimed that they had experienced similar dreams on the same night. A *clairvoyant dream* needed to match a distant event, and a purported confirmation of this match had to be made during wakefulness. A *precognitive dream* report was one that provided specific information about a future event that purportedly matched information later gleaned about that event. In a *past-life dream*, the dreamer had to report taking on a different identity than his or her ordinary identity, one subjectively associated with a purported former lifetime. To be scored as a *visitation dream*, the deceased person or an entity from another reality had to provide counsel or direction that the dreamer found of comfort or value. When a dream fell into two categories, it received a score of 0.5 for each of the categories, rather than a score of 1.0, awarded when a dream represented a single category. The dream reports were scored by at least two people, and inter-rater reliability was no lower than 95% for each category.

## Results and Discussion

There were 175 transpersonal dreams, or 10.5% of the total 1,666 dream reports from six countries. Of them, there were 57.5 (3.4%) "transpersonal identification" dreams, 24 (1.4%) OBE, 28.5 (1.7%) lucid, 14 (0.8%) dreams-within-dreams, and 51 (3.1%) psi-related dreams. Female dreamers reported 104 transpersonal dreams or 11.4% of all female reports (including 33 psi-related dreams or 3.6%), while male dreamers reported 71 or 9.4% of all male reports (including 18 psi-related dreams or 2.4%). Of psi-related dreams, there were 5 clairvoyant (0.3% of the total dream reports), 2 telepathic (0.1%), 2 shared (0.1%), 5.5 past-life (0.3%), 19.5 visitation dreams (1.2%) and 17 precognitive dreams (1.0%). Dreamers from Japan had the highest percentage of psi-related dreams (5.9% of the total number reported by Japanese seminar participants), followed by Russia (5.3%), Argentina (3.3%), Brazil (2.7%), the Ukraine (2.4%) and the United States (1.8%). In the analysis of the entire sample of 175 dreams, the country with the highest percentage of such dream reports was Russia (15.4% of the total number reported by Russian seminar participants), followed by Brazil (13.3%), Japan (11.8%), Argentina (11.4%), Ukraine (7.9%), and the United States (7.8%).

It would be tempting to offer explanations for these differences, but the lack of standardization among sample populations forestalls this option. Having that in mind, we still have to ask a question: What parameters of a particular culture (e.g., folk customs, belief systems) need to be explored to determine the degree to which it is psi-conducive and whether dreamers in a more psi-conducive culture report more transpersonal and/or psi-related dreams?

In an additional analysis of reported ESP-type (i.e., telepathic, clairvoyant and precognitive) 24 dream reports (1.4% of total reports) regarding the type of event in the dream indicated that four dreams included positive events—a higher percentage than reported in collections of spontaneous psi experiences, although the total number of ESP-type dream reports is too small to warrant definite conclusions. Twenty dreams were either negative or trivial (commonplace).

It is possible that ESP-type (telepathic, clairvoyant, and precognitive) dreams represent coincidental matches, unless they are gathered under tightly controlled conditions or include extremely precise descriptive material. Finally it should be noted that female dreamers reported more transpersonal and psi-related dreams than did male dreamers. Do women actually have more of these dreams, or are they simply more able to recall them, and more willing to report them? Those questions, among others, need to be addressed in future studies.

# QUANTUM CORRELATION AS A POTENTIAL DETECTOR FOR PSI - PHENOMENA

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In 1935, Einstein, Podolsky and Rosen (EPR) published their paper "Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?" (Einstein et al., 1935). In this paper Einstein illustrated his critique of quantum mechanics, which he had been repeating since 1927, by means of a *Gedankenexperiment* ("thought experiment"). Looking for deeper reasons for the incompleteness, Einstein came up with the "hypothesis of a remote effect, which seems difficult to accept" (Einstein, 1948 p. 323). Later, from 1946, he associated this remote effect with parapsychological terms time and again. In a letter to Max Born, he spoke of "spooky actions at a distance" (Einstein & Born, 1971 p. 158). Likewise, in an essay he stated that maybe the "measurement of S1 [System 1] (telepathically) changes the real situation of S2 [System 2]" (Einstein, 1959 p. 85). In a letter to Karl Renninger, Einstein even spoke of "a telepathic linkage between things present in different parts of space" (Jammer, 1974 pp. 494f, footnote 75). That these uses of parapsychological terms were more than mere figures of speech is evidenced by a quotation from 1949, where Einstein's remark closes: "with the reproduction of a brief conversation I had with an important theoretical physicist. He: 'I am inclined to believe in telepathy.' I: 'This has probably more to do with physics than with psychology.' He: 'Yes.'" (Einstein, 1959, p. 683).

Since that time, with the development of experimental physics, the so-called EPR-correlation evolved from a *Gedankenexperiment* to a real one. Today, using photons, quantum correlation can be demonstrated over a distance of kilometers. Thus, Einstein's remarks on the possible nature of psi can be subjected to experimental tests today. Is there really a relationship between the two remote effects EPR-correlation and psi-correlation, is there an interference between those two effects?

In 1984, Charles Bennett and Gilles Brassard of Montreal University introduced the theoretical model of quantum cryptography (Bennett & Brassard, 1984). This concept uses the entanglement of photon pairs as a detector to find out whether a transfer of information is being "eavesdropped". For safe encryption of data, both the sender and the receiver need a "key", a random sequence. They can be supplied with that key by a sequence of quantum correlated photons (Weinfurter & Zeilinger, 1996). If a "spy" carries out a measurement at one of the two photon strings and sends them out again according to the values measured, he *breaks* the quantum entanglement, and the rate of correlation between the two photon strings declines to a "classical" rate (Weinfurter & Zeilinger 1996). Thus, each "eavesdropping" can be detected.

Quantum cryptography on the basis of EPR-correlation is an exceptionally sensitive detector for disturbances. Very recent considerations in physics even came to the conclusion that the information flow out of an entangled system may perhaps lead to the breakdown of quantum correlation. Precisely this idea opens the door for an application in psi research. Instead of the mentioned "spy", one can imagine a conscious subject trying to "eavesdrop" the random sequence (the "key"), interacting with the physical system by ESP. Then it is a question of whether profiting from this "pure" information by ESP can lead to a disturbance of the EPR correlation that in turn leads to a decline of the counting rate of the correlated photon pairs. What results are to be expected by such an experiment?

- If the subject predicts the targets significantly better than to be expected by chance without any effect on the EPR-correlation, it might well be that the "key" (random sequence) used for quantum cryptography is at least partly

recognized. In this case, we cannot but conclude that quantum cryptography is not the perfect safeguard against eavesdropping after all. This finding in itself would be of great importance to physics.

- According to the recent theoretical concept of quantum cryptography, however, each attempt at eavesdropping (in the sense of an information profit) should destroy the entanglement of the photon pairs. Therefore, the number of correlated photons should considerably decrease if the number of correctly predicted targets were significantly higher than expected by chance.
- According to Costa de Beauregard (Costa de Beauregard, 1981), if a psychokinetic agent[1] (Ibison & Jeffers, 1998) at one side of the sequence of entangled photon pairs were to influence the random numbers, this change would have to take place at the other side too. The result would be a correlated shift of the relative frequencies of the random numbers on both sides, which would represent an information transfer.

The last two cases offer the opportunity to detect the influence of consciousness on EPR-correlations. A positive score would confirm Einstein's notion, as well as the hypothesis of von Neumann (1955) and Wigner (1961, 1982) on the collapse of the wave function because of an influence of consciousness.

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# PERSONALITY FACTORS AND ESP DURING GANZFELD SESSIONS

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## INTRODUCTION

Personality studies have been demonstrated to be stimulating areas of research in parapsychology. Palmer's studies (1978) and Sargent's (1981) found that experiments using extraverts as participants provided better results than those using introverts.

The psychologist Hans Eysenck took the position that extraverted participants should manifest better psi ability than introverted participants because they respond more easily to new stimuli (Eysenck, 1967). He also speculated that psi could be a primitive form of perception that precedes cortical development, this latter suppressing the function of psi. It is also possible that the better results obtained by extraverts could be due to the fact that they can relax better and feel comfortable in the social situation of a typical ESP experiment in the laboratory.

We describe the dimensions of personality evaluated in this experiment. Elevated neuroticism (N) scores are indicators of emotional lability. High scores of extraversion are indicative of a person who is expansive, impulsive and uninhibited. At the other extreme, the introvert is shy, introspective, and reserved.

*Hypothesis:* We believe that there will be a relationship between extraversion and psi-hitting. Greater extraversion will result in more hits. Also there will be a relationship between neuroticism and hits, with less neurotic participants gaining more hits. The ganzfeld technique was utilized to stimulate ESP.

## METHOD

### *Participants*

Thirty participants (22 females and 8 males) each participated as a receiver in one ganzfeld session. The ages ranged between 14 and 84 years (Median= 37.5; SD= 15.22). They were students of parapsychology at the IPP recruited from his/her belief in psi. All had *at least* one pior psi experience.

### *Procedure*

The total time for the ganzfeld stimulation was 33 minutes. The experiment was double blind, so that AP, who was in contact with the participant during the pre-test and post-test, did not know which picture-target JV had selected. The sending room was not shown to the participant before the session began. The sender and the receiver never had any contact, either before or after the ganzfeld session. Whilst the receiver was in the ganzfeld JV observed the target picture, attempting to send it to the receiver for fifteen minutes. AP had no contact whatsoever with the sender (JV) during the selection process nor whilst JV attempted to send the target picture. The receiver always remained isolated from the experimenter during the period of ganzfeld stimulation.

Participants were asked to verbalize their impressions as much as possible immediately after each ganzfeld session. About ten minutes after the end of the ganzfeld session, the sender left the room leaving

the target set on the computer screen, to avoid contact with the receiver and the experimenter. All participants received feedback of their performance and their results from the personality questionnaires.

*Instruments*

*Eysenck Personality Inventory:*
We used form A of the Spanish version by Eysenck & Eysenck (1978). The EPI is a two-choice questionnaire (YES-NO). It measures three personality dimensions: Neuroticism (N), Extraversion-introversion (E), and Sincerity (S). In this investigation the Sincerity variable was taken only as a confidence measure.

*Pre-ganzfeld Questionnaire:*
The questionnaire consists of four questions. Each participant had to indicate his/her present approximate degree of relaxation (from very tense to very relaxed), his/her mood before the session (from bad to excellent), expectation of success (from very low to very high), and motivation (from very low to very high) on an ordinal scale with values from 1 to 10.

*Objectives and Randomization*

The participant's target picture was selected by the sender using a random number table. The targets were selected from clipart of 3,500 color pictures of high resolution in *jpg* format. Ten groups of well differentiated targets were selected. We generated a sequence of (pseudo) random numbers using the statistical program *StatPac Gold 4.5*. JV kept a register with the name of the participant and the selection of the group, subgroup and target picture. AP never had access to this register.

When the ganzfeld session was concluded, JV used the same selection procedure to create the picture set for the judging procedure. This procedure was also unknown to AP. Once the three decoys had been selected, JV carried out a final randomization procedure to determine the position of the target picture in the judging set. The decoys were otherwise placed as JV decided and this procedure was also unknown to AP. Participants had a 25% chance of obtaining a hit by chance alone.

## RESULTS

We reduced the sample to 25 participants according to predetermined criteria. The overall results were not significant ($p$= .15). We used Fisher's exact probability.

Table 1
NEUROTICISM AND ESP

| | L. N. % | H. N. % | TOTAL % |
|---|---|---|---|
| Hits | 5 (38.46) | 4 (33.33) | 9 (36) |
| Misses | 8 (61.54) | 8 (66.67) | 16 (64) |
| TOTAL | 13 | 12 | 25 |

Fisher's exact test $p$= .56 (one-tailed)

Table 2
EXTRAVERSION AND ESP

| Hits | Intro. % | Extro. % | TOTAL % |
|---|---|---|---|
| Yes | 1 (8.33) | 8 (61.54) | 9 (36) |
| No | 11 (91.67) | 5 (38.46) | 16 (64) |
| TOTAL | 12 | 13 | 25 |

Fisher's exact test $p$= .008 (one-tailed) *Phi* = .482

Table 1 presents participants' scores on the neuroticism scale. Table 2 shows the number of hits according to scores on the extraversion scale. We used Fisher's exact test. The level of significance was also preplanned at .05. The variables of relaxation, humor, expectation and motivation were measured on an ordinal scale that went from 1 to 10, but the results were not significant.

## DISCUSSION

We note that the difference found between introverts and extraverts is quite telling. Unfortunately, the sample was small. Participants all believed in ESP and had been recruited from parapsychology courses. We think it is possible that differences in personality dimensions are among some of the many factors that play a role in the ganzfeld.

We plan to conduct experiments to see if the ganzfeld condition by itself facilitates ESP performance, for example, by alternating the conditions ganzfeld vs. no-ganzfeld with each participant, and correlating such conditions with other personality variables.

We also aim to explore the ganzfeld from a more phenomenological perspective. A future design will include the following considerations: (a) a measurement of the participants' expectation of success and the type and frequency of their previous psi experiences; (b) to explore the feelings and participants' expectation of success regarding the experimental scenario.

In addition, we hope to explore the ganzfeld *independently* of any parapsychological context. That is, participants in the ganzfeld experiment should be paired with participants subjected to the same protocol who do not know they are participating in a psi experiment, or who do not know that the ganzfeld has anything to do with a parapsychological study.

All these considerations are very important if we want to pursue an approach that is not merely experimental. Consequently, we hope to conduct future studies testing these speculations.

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# ARE FALSE MEMORIES PSI-CONDUCIVE?[1]

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Blackmore and Rose (1997) suggested a link between psi and a person's tendency to confuse reality and imagination, and reported an experiment that examined two hypotheses. The first was that people may misinterpret their own imagination as reality; leading them to conclude that a psychic phenomenon has occurred when in fact it has not. In this case we would expect believers in the paranormal to be more likely to confuse reality and imagination. The second proposed that the confusion between reality and imagination is itself psi-conducive - as though psi can somehow sneak into the uncertainty gap.

Subjects were shown slides, half of which showed common objects with labels underneath, and the others just labels. For the latter they were asked to imagine the objects named. Some were shown once and some three times. Over the following two weeks, subjects were asked to describe, draw and answer questions about all the objects. By the end of the experiment we expected that many of them would have been confused into thinking that they actually saw some objects that, in fact, they had only imagined (i.e., false memories).

Psi targets were pictures of half of the imagined objects (randomly selected for each subject) and were concealed in envelopes during the first session. The analysis compared the number of false memories on targets (hits) with the number on non-targets (misses) for each subject. Belief was measured using the Revised Paranormal Belief Scale (Tobacyk, 1988) and scores were correlated with the number of false memories for each subject.

The technique used in Blackmore and Rose (1997) successfully induced false memories in many subjects. That is they said that they had seen an object when they had actually imagined it. 8 subjects made a total of 12 errors of this kind. A significant psi effect was found. That is, there were more false memories for target objects (ESP hits) than for non-target objects (ESP misses) ($t$=2.25, 32df, $p$=0.032, 2-tailed). Using Cohen's d (Rosenthal, 1984), the effect size was 0.80. We predicted a correlation between the number of false memories and PBS score. However, no such correlation was found ($rs$ = 0.069, $n$=32, $p$=0.70). Neither was there any correlation between total errors (regardless of type) and BPS score ($rs$ = 0.046, $n$=33, $p$=0.80).

In this research brief we report two further experiments carried out using the same technique. The first is an exact replication of the original experiment designed to see whether the apparent psi effect could be repeated. The second used a modified design in an attempt to increase the number of false memories obtained.

In the first experiment 26 psychology students took part, and 13 subjects made a total of only 19 false memory errors. There were 10 hits and 9 misses, which is non-significant ($t$=0.25, 12df, $p$=0.808, 2-tailed). No correlation was found between the number of false memories and BPS score ($rs$ = -0.134, $n$=25, $p$=0.53).

Problems with this experiment included the low numbers of subjects completing all phases and the low numbers of false memories produced. We completed a further study (not reported here) in which subjects

[1] With thanks to the Perrott-Warrick fund for their financial assistance to this research, and to Kerry Grey who assisted with running one of the experiments.

were tested individually with the stimuli presented by computer. We measured the time they took to draw and describe the objects and the time taken to recall which objects they had seen in the final session. From the results of all these experiments we designed the final classroom study as follows.

Time limits previously imposed on the tests were removed. Subjects' data were included if they had attended only one of the intermediate sessions and the time between the first and last session was increased from three weeks to two months.

82 psychology students took part. The number of false memories improved; 60 subjects made a total of 148 false memory errors. There were 73 false memories for target objects (hits) and 75 false memories for non-target objects (misses); a non-significant difference ($t$=-0.22, 81df, $p$=0.829). Once again, no correlation between PBS score and false memory was found ($rs$ = -0.178, $n$=81, $p$=0.11).

The modified classroom design used in this experiment appears an ethical and effective method for producing false memories. The failure to replicate the original psi result was disappointing, and having reviewed the possible causes the most parsimonius explanation for the original result appears to be chance. Our second hypothesis, that believers in the paranormal might make more false memory errors, was not confirmed in any of the experiments. Whilst this may, in part, be due to the well documented weaknesses of the Tobacyk (1988) scale, the results suggest that there is no relationship. However, these findings do not rule out the possibility that believers in the paranormal may be more likely to have false memory for ostensibly paranormal events.

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# PROPOSAL FOR A PROOF- AND PROCESS-ORIENTED META-ANALYSIS ON DMILS AND REMOTE STARING STUDIES

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## INTRODUCTION

There are two important and strongly related experimental paradigms within parapsychology that have been intensively researched throughout the last two decades.

DMILS (Direct Mental Interaction in Living Systems) experiments are addressing the question whether there is a correlation between a person's physiology and another person's intentional efforts to change that physiology even if the two persons are at certain distance from each other and have no possibility to communicate by conventional means.

Remote Staring experiments examine whether someone can detect a gaze by another person even if that other person is at some distance and can gaze only through video equipment.

Both experimental setups use electrodermal activity (EDA) as dependent variable. The idea behind using EDA as a dependent variable is that there might be some subliminal detection of psi-mediated information that usually gets suppressed by consciousness but can be detected with a measurement system that monitors autonomous nervous system activity such as EDA.

So far 30-40 experiments by different researchers in different labs in Europe and the United States have been conducted. Two meta-analyses (Braud & Schlitz, 1991; Schlitz & Braud, 1997) have shown that one third of the studies show significant results and that the statistical integration of all study outcomes indicate a small to medium effect size with a high significant level that cannot be explained by chance.

Both meta-analyses gave answers to proof oriented questions. But so far there has not been any meta-analysis that addressed process-oriented questions. These process oriented questions are the most relevant for the researchers actually involved in the field. To understand the effects in a more detailed way, it is necessary to take a closer look to the whole sample of studies that is meanwhile big enough to give good answers on some important questions.

As a set of new experiments have been conducted since the publication of the last meta-analysis and some of these studies are the largest that have been ever done, a new proof oriented analysis is also timely.

## METHODS

Two separate meta-analyses will be calculated. One for DMILS experiments and one for Remote Staring experiments. The meta-analyses will only include studies that are addressing the questions of the according research paradigm by the use of EDA as a dependent variable and with human participants.

All studies that have been part of the meta-analysis by Schlitz & Braud (1997) will be included. For additional studies a literature research of all relevant journals and proceedings from 1996 until today will be done. Additional unpublished material will be included as far as it is possible to obtain it.

The proof oriented part will be calculated according to a certain pre-defined statistical model (random effect model). Therefore all studies will be weighted by their size. The whole sample then will be tested on

homogeneity. The criterion for an overall effect for a homogenous sample of studies will be whether zero is or is not included within the 95% confidence interval of the mean effect size of that sample.

We are planing to use the *r*-effect size according to Rosenthal (1991) and to calculate the meta-anlysis according to the approach for correlational data described by Hunter & Schmidt (1990) including different appropriate methods provided by Cooper & Hedges (1994).

The process oriented part will be done by moderator analyses and correlational analyses. Therefore all studies will be coded by three independent coders who are blind to title, author and date of the study. A relevant coding system will be developed.

With the results of the coding the whole sample can be split in several subsamples and those subsamples will also be checked for homogeneity and whether the mean effect sizes are different from zero.

Questions we are planing to investigate in that part of the analysis will be:

- Is the quality of a study related to the outcome?
- Is the size of a study related to the outcome?
- Is the quality of the EDA methodology related to the outcome?
- Is there a difference between difference labs?
- Is the application of certain safeguards related to the outcome?
- Is there a correlation between the year the study was conducted and the outcome?
- Is there a difference between studies occupying different staff at different levels (lab director, principal investigator, experimenter, sender, receiver) and studies with the same person serving in several functions?
- Is there a difference between studies taking EDA parameters from the tonic signal and studies taking them form the phasic signal?
- Is there a difference between studies measuring EDA as skin resistance and such measuring EDA as skin conductance?
- Is there a difference in outcomes according to different places (fingers or hands) and methods of electrode placement (different sensitivity for fine movements of the hand)?
- Is there a difference according to the lengths of the epochs?
- Is there a difference according to the lengths of the experimental session?
- Is there a difference according to different groups of participants (naive, gifted, known to the experimenter etc.)

The single steps of the moderator analysis will be done data-driven with the aim to divide the whole sample of studies in a set of homogenous subsamples. Each step will be documented.

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# PANEL DISCUSSION:

# HANS BENDER AND THE IGPP

Eberhard Bauer (Chair), Erlendur Haraldsson, Walter v. Lucadou, Inge Strauch, & Ulrich Timm

## 1. Introduction: Hans Bender – An Appreciation

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There is no doubt that Professor Hans Bender (1907-1991) was the leading figure in post World War II German parapsychology. In my contribution I will describe various aspects of his work which became crucial for the development of German psi research. As for Bender's historical roots within the field, one has to mention (a) the French psychiatrist Pierre Janet and his major work *L'Automatisme Psychologique* (1889) and its influence on Bender's own Ph. D. dissertation on *Psychische Automatismen* (1936), (b) Rhine's book *Extra-sensory Perception* (1934) published nearly simultaneously with Bender's own experimental study *Zum Problem der aussersinnlichen Wahrnehmung* (1935), (c) the influence of Hans Driesch's book *Parapsychologie: Die Wissenschaft von den ‚okkulten' Erscheinungen* (1932) - the first methodology of psychical research ever written in German - on Bender's own understanding of the field, (d) the personal encounter with Carl Gustav Jung already going back to 1933 whose depth psychological understanding of mental processes dominated Bender's own thinking all his life, especially Jung's concept of synchronicity.

One of Bender's central aims was to introduce psi research into a German university in an institutionalised form. To realize this ambitious goal, Bender founded in 1950 his "Institut für Grenzgebiete der Psychologie und Psychohygiene e.V." (IGPP) which represented for decades to come an unrivalled center for parapsychological research, information and advice in Germany. "*Psychohygiene*", a term which is difficult to translate into English, stands for Bender's conviction that scientific research into "*Grenzgebiete*" has also to deal with strong belief systems on the part of individuals and the public. To deal with these different attitudes Bender promoted the slogan "Positive Kritik des Aberglaubens" (positive criticism of superstition) which he used also in his tireless attempts to popularize parapsychology. So, offering psychological counseling services for persons disturbed by alleged psi or anomalous phenomena is also part of "*Psychohygiene*" as understood by Bender. In 1954, Bender was appointed a professorship for "Grenzgebiete der Psychologie" which was transformed into a full professorship in 1967. Thus, for the first time in German academic history parapsychology became part of the curriculum of psychology.

There are several dominant features in Bender's parapsychological work: (1) his interest in spontaneous psi experiences, especially in precognitive dreams; (2) his interest in field work, as exemplified by his research into the psychological meaning and physical aspects of poltergeist phenomena; (3) his interest in bringing together qualitative with quantitative approaches as exemplified by his work with the Dutch paragnost Croiset; (4) his interest in the interdisciplinary aspects of psi research, especially the relationship between psi and physics; (5) his conviction that a scientific validation of paranormal phenomena can also contribute to a better understanding of the position of man in nature. It is the aim of this panel to highlight some of Bender's contributions to parapsychology.

## 2. HANS BENDER AND THE ART OF DREAMING: A PERSONAL MEMOIR

Inge Strauch
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This contribution is based on personal experiences, related to Hans Bender's engagement in the psychology of dream, as both educator and researcher.

While serving as Professor of Psychology at Freiburg University, Hans Bender regularly provided absorbing lectures on the topic of dreams. He introduced generations of students to the phenomenological variety within the world of dreams. It was his main aim to illustrate that dreams may only be analyzed within an individual context, and that the different psychotherapeutic concepts must, at all times, select their own directions of approach.

Within more intimate seminars, which took place at the Library of the mysterious Eichhalde-Institute, knowledge of the dream was deepened, and we, as students, had the opportunity to use our own dreams by exploring various ways of interpretation; naturally, the dream interpretations patterned on C.G. Jung, as contrasted to Freud's psychoanalytic approach, enjoyed particular popularity.

Towards the end of the 1950s, a small group of psychologists and philosophers met under the benevolent guidance of Hans Bender, seeking to achieve a more intensive study of information-processing in dreams. The experiment had the label 'dreams to order' in German. One of the participants handed out a sealed envelope that contained a 'dream command', such as 'I encounter a lion in the desert'. The envelope was to be opened at home in the evening and, for a period of one week, the subject was to reflect upon this image before going to sleep, with a view to influencing dream content. At the next meeting, the dream yield was presented, hits and misses discussed, and kinds of transformations and style in the processing identified.

Hans Bender was, of course, particularly interested in spontaneous ESP phenomena in dreams. For example, over a period of several years, a series of dreams of a precognitively gifted actress was documented, and during follow-up investigations, we scrutinized their precognitive contents at time and place.

When, during the closing years of the 1950s, the discovery of REM-sleep became known in Germany, Bender was instantly ready to send his assistant (the author of this report) to the U.S.A. in order to study polygraphic registration of sleep and the interpretation of sleep structure. With the generous financial support of the Parapsychology Foundation in New York and following procedures of Montague Ullman, I was able to engage in telepathic dream experiments under controlled conditions. By 1963, at Freiburg University, experimental dream research was established, which later on, at the Universities at Saarland and, until recently in Zurich, was continued intensively.

Hans Bender's wide intellectual horizon was particularly noticeable, as was his enthusiasm for the creative powers of the Unconscious, and his openmindedness towards new methods and novel developments, all of which had a lasting impact on his students, as well as on his colleagues and collaborators.

### 3. Hans Bender's investigation of children who speak of previous life

Erlendur Haraldsson
*University of Iceland*

Professor Bender had exceptionally wide and varied interests in the field of the paranormal, particularly regarding spontaneous cases, or reports thereof. Our association started when he invited me to write a thesis on the numerous accounts of spontaneous cases found in the volumous 13th century Icelandic sagas. However, that was not the only far-off country where he was aware of interesting case material. Sri Lanka became of much interest to him, and he visited the country a few times. There he studied a few cases of children who spoke of a previous life. One such case in particular impressed him and he spent considerable time investigating it with my late friend and associate Godwin Samararatne as interpreter who has told me about this investigation. Files on this case are in the archives of the Freiburg Institute and they will be reviewed in this presentation.

### 4. Hans Bender – Physics and the Elusiveness of RSPK

Walter v. Lucadou
*WGFP, Freiburg*

One of Hans Bender's central fields of interest was the area of RSPK phenomena. For him they were not only a *'via regia'* for the understanding of human nature, but also a challenge for interdisciplinary research and a challenge for parapsychology. Surely, Bender was not a friend of 'sterile' experimental investigations, but he was truly a friend of 'physics'. From the beginning of the Eichhalde Institute he realised that parapsychological theory cannot be developed without the intensive contribution of theoretical physics. He kept contact with many eminent physicists of his time, like Wolfgang Pauli, Werner Heisenberg, Pascual Jordan or Carl Friedrich v. Weizsäcker. And he also encouraged physical investigation of RSPK-cases and other spontaneous ostensible PK-effects. He also realised that any theory of parapsychology has to cope with RSPK, if it should be of any explanatory value for psi-phenomena. In spite of the fact that he was one of the rare representatives of genuine *'Naturforscher'* for whom personal observation and photographic documentation are the core of all scientific enterprise, he was aware of the limitations of this approach. Similar to Rhine he believed that parapsychology can become a real science and may simultaneously transcend it. I believe that he was the first one who found one of the most fundamental characteristics of psi, namely its 'elusiveness'.

## 5. Hans Bender's Contribution to the Development of a Free Response Technique The Chair Experiments with Croiset

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From 1947 onwards the Dutch parapsychologist Tenhaeff conducted so-called chair experiments with the Dutch sensitive Gerard Croiset. In these experiments Croiset tried to describe a person who would sit on a randomly assigned seat at the time of a future demonstration. From 1952 until 1970 Dr. Bender participated in many of these experiments or conducted them independently. While in the beginning this quasi-experiment in no way fulfilled the criteria of a scientific design, between 1953 and 1954 it was improved by Bender in 3 ways: 1) Croiset's statements were given to each of the participants before the demonstration took place; 2) by questioning the subjects the potential target person was determined in advance; 3) after that, the seats were distributed according to a reliable random procedure. – In 1955 Bender made the first attempt to evaluate the results statistically. For each participant a quantitative score was obtained, which was a kind of weighted number of hits over the single statements. Through a statistical test was decided if the score of the target person differed significantly from the distribution of the other scores. This design can be seen as an independent contribution to free response techniques. In the years 1965 to 1970 the questionnaire and the statistical evaluation were further developed by the author. – Altogether 15 experiments with 40 target persons have been conducted using Bender's technique. Only 4 of them are statistically significant. However, a meta-analysis, performed by the author, provides a $p < .01$.

# PANEL DISCUSSION

# THE IGPP MIND/MACHINE CONSORTIUM PORTREG REPLICATION

Roger Nelson (Chair), Emil Boller, Holger Bösch, & Joop Houtkooper

## 1. Description of the Consortium and Benchmark Research

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A consortium of laboratories to study consciousness-related anomalies was created in late 1995 and early 1996. It is called the IGPP Mind/Machine Consortium, and comprises research groups from Freiburg, Giessen, and Princeton. From its inception, the Consortium's purpose has been a supportive, multidisciplinary collaboration to bring differing perspectives and expertise to bear on well-defined issues in anomalies research, with particular attention to mind/machine interaction studies. Specifically, we intended to integrate the experience and engineering expertise of the Princeton group with psychological, psychophysiological, statistical and theoretical expertise from Freiburg and Giessen. Our aspiration was and is to assemble effective tools and insights from different disciplines, for application to some of the most challenging and interesting research questions in science.

The Consortium's first major project was the development of a program to replicate and progressively extend the "benchmark" Random Event Generator (REG) experiment of the Princeton Engineering Anomalies Research (PEAR) group.

Electronic REG devices were used as the target of directed intention in controlled laboratory experiments by several investigators before the PEAR experiments began in 1979. The PEAR REG experiment was itself a conceptual replication of others, most directly those of Helmut Schmidt. As an engineering project, there was a primary focus on physical parameters, and on rigorous controls and calibrations, but the design also included conditions relating to psychological questions and subjective states. The design philosophy specified large databases from individuals, within a constant framework of consistently defined conditions allowing large-scale comparisons between experimental conditions. Individual operators were allowed to explore parameters of feedback, data generation rate, assignment mode for intentions, etc., over their own extended databases of multiple sessions. (Sessions can be regarded as replication units; in this case they comprised 1000 trials per intentional condition.)

Over a decade of data generation in this basic experiment, nearly 100 people contributed one or more sessions, and about 30 produced 10 or more, thus joining a category of prolific operators whose data allow more sophisticated analytical explorations. The experiments all used a balanced protocol with separate "HI" and "LO" aim conditions (positive or negative mean-shift, respectively), and a baseline condition with no assigned intention. The simplest comprehensive calculation was the overall comparison of HI versus LO, and the outcome on this measure showed a significant departure (3.8 sigma) from expectation, although the actual size of the deviation was very small, on the order of one part in 10000. This small effect was taken as the primary target for the Portreg Replication program.

In addition to the simple analysis of the concatenated data, the rich variety of subsets in the database was examined to determine what parameters might be influential and deserve further study. Among these were the mode of assignment for intentions (volitional, random), the type of feedback (graphic, digital, none), the run-length (100, 1000 trials), the amount of prior experience (series position), and operator gender. These parameters also were monitored in the replication study, for inclusion in the analysis protocols.

## 2. PortREG Replication Design and Phase 1: Results

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At the planning meeting in Princeton shortly after the inception of the Mind/Machine Consortium, the members decided that each laboratory would accumulate 250 PortREG sessions in a replication study, using essentially similar protocols. The decision that the beginning phase (Phase I) should have 250 sessions, each with 1000 trials per condition, was led by power considerations. On the basis of PEAR's benchmark experiment, with an average effect size of the order of one deviation per 10,000 random events, the power of 0.97 (at alpha = 0.05) for the concatenated database (750 experimental Phase 1 sessions) seemed sufficient for the purpose of a direct inter-laboratory replication attempt.

On the laboratory level, however, the 250 Phase I sessions seemed insufficient (power = 0.64) for these experiments to serve as independent replications, which was a goal of GARP and FAMMI. Therefore it was decided that they would carry out at least 250 additional sessions in a second phase, thus increasing the power of these experiments to at least 0.88. The results of these intra-laboratory replications are presented by other panelists. Some of these analyses may be confounded with analyses on the inter-laboratory level, and this must be considered when interpreting them.

The primary hypothesis was that "high intention runs" (HI) would show positive deviations and "low intention runs" (LO) would show negative deviations from mean chance expectation (100, which is the expected sum of 200 binary random events per trial). The formal hypothesis was that HI - LO would be positive and show an effect-size comparable to that in the benchmark database. This primary hypothesis could not be confirmed on the basis of the concatenated Phase I data. The difference, although pointing in the expected direction ($Z = 0.60$, $p = 0.27$ (one-tailed), N = 300,000,000 bits), failed by an order of magnitude to replicate the effect-size of the prior PEAR benchmark experiment. Moreover, when we examine the details of individual conditions of intention on the laboratory level, the results appear to be nonuniform.

Secondary hypotheses were formulated on the basis of prior research (gender- and series-position effect) or were based on important independent variables of the experimental protocol (assignment, feedback and runlength). Of these, significant differences within the concatenated dataset emerge only for feedback mode (digital, graphic or none). Digital feedback was notably superior to the other forms of feedback. This finding is especially important against the background that the original PEAR benchmark REG most often used digital feedback, and that the effect-size of the benchmark REG experiments and the PortREG experiments with digital feedback is in the same range. However, only 94 PortREG sessions in the concatenated dataset were carried out using digital feedback (this was an optional choice of the

participant) compared with 613 using graphic feedback. Nevertheless, this finding might offer some insight into factors that could explain the failure to replicate the primary effect.

## 3. FAMMI PHASE 2: DESIGN AND BASIC RESULTS

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In order to perform an independent replication, the German laboratory groups decided to conduct a second phase with at least 250 more sessions. FAMMI used this phase to examine psychological aspects of MMI experiments.

The psychology of MMI experiments is a broad area where different questions are both possible and important. An obvious and often-mentioned topic in the field concerns differences in the attitudes and personalities of the participants which may explain and account for differences in the psi performance. The relationship between experimenter and participant, the current mental state of the participant, and the participants' behavior and experience in the experiment are other facets which also may be of interest. We addressed some of these questions, always aware of the preliminary status of our efforts.

Though we included new elements, the basic experimental protocol was kept the same, and in some respects it was even more strict. In contrast to Phase 1, participants were not allowed to change experimental conditions between sessions. This has the advantage that the stability of results over sessions, or the retest reliability, could be investigated without the influence of potential moderator variables.

Three different experimenters each tested 17 female and 17 male subjects. Most of the participants were recruited by an advertisement in a free newspaper. They participated in one initial session of mostly computerized psychological tests and came in on three separate occasions for the three experimental sessions. The participants were paid.

The first contact between participant and experimenter usually was by phone. The experimenter briefly explained the experiment and the conditions. When a participant committed to participate, a date for the psychological tests was fixed. The experimenters then rated the participant's motivation and their impression of the participant. The first session was used for psychological assessment and for introducing the subjects to the mind/machine interaction experiment. The experimental sessions always followed the same pattern. The experimenter started the experimental program using the participant's identification number and then left the room. The participant filled out short paper-and-pencil questionnaires, then began the experiment. The participant informed the experimenter when s/he had finished, and the experimenter gave him/her another set of paper-and-pencil tests. After the third experimental session a short tape-recorded interview about the participant's impressions of the experiment took place.

The results, especially in respect to the main questions, are in line with the Phase 1 data. In the FAMMI database there is no statistically significant difference between Phase 1 and Phase 2. This means that despite their novelty the new elements did not improve the results and the more strictly enforced experimental procedure did not substantially decrease the results. Perhaps both potential effects of the changes compensated each other. None of the expected effects could be confirmed. More details of the results of Phase 2 of FAMMI will be given in a separate presention at the conference.

## 4. Mind-Machine Interaction: Two Phases of Replication in Giessen

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An effort to replicate a seemingly robust experiment has delivered a null result. If we attribute this to the experimenters learning nothing new from a straight replication, it is all the more interesting to study the details of the data, especially for newly introduced aspects of the experiments. Any effort to replicate is beset by changes in conditions, which generally are assumed to play a minor role. But potentially important differences may occur in the setting, the experimenters, and in the treatment and instruction of participants. Furthermore, we may study correlations with psychological traits of the participants through questionnaires and observation of their behavior, namely, choices they make, in the experiment. These analyses are exploratory and their significances should be qualified for multiple analysis.

In the Giessen Anomalies Research Program the Portreg replication was carried out in two phases, of 250 and 271 sessions respectively. The Phase 1 results in Giessen are characterized by differences between conditions: between modes of assignment of intention, between feedback modes, and between subsequent sessions by the same participant. Moreover, an apparent concomitant PK effect has been observed on the variance between 200-bit trials, which is significantly reduced overall.

A session-order (series-position) effect has been found, but in contrast to the pattern in previous PEAR data, the highest, significant, scoring occurs not in the first session, but in the second, with a drop to negative scores in the fourth session. This suggests that the session-order effect is shifted by one session. This observation has led to a new condition in Phase 2: Participants either are invited for more sessions after the first session, as was done in Phase 1, or, they are told before the first session they are welcome to contribute more sessions. A second change in the design has been the introduction of alternative volitional strategies, to be chosen for each intentional run. We have taken five promising strategies from an experiment by Gissurarson: Visualizing, attentive relaxation, confidence, resonance and guessing, while participants could also choose their own strategy.

The results in Phase 2 are slightly more positive overall than Phase 1, but remain non-significant. Several of the apparently significant differences between conditions in Phase 1 appear in Phase 2 with the sign reversed. This is also true for the variance effect. The attempt to manipulate the session-order effect has failed, the new condition producing negative scores, while the original Phase 1 condition produces a marginally significant positive result overall. The session-order effect in Phase 2 reveals the same tendency as in Phase 1: The second sessions again show a positive score. The volitional strategies reveal some differences: runs with resonance as the strategy score significantly; second best is self-chosen strategy. The results for the three experimenters in Phase 2 differ significantly.

The questionnaire data in this study assess personality, attitudes, and reported experiences. These reveal a small number of relatively weak relationships, with a single exception, namely, a large effect of marital status. Other aspects of interest include behavior in the experiment, e.g., timing, choice of intention and volitional strategy, and correlations with the incidence of atmospherics and local sidereal time, and performance on an ESP task that has been administered earlier.

## 5. Studies of anomalous structure, Portreg Replication, Phase 1

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The results in Phase 1 proceeded in the intended direction for all three laboratories, but failed by a wide margin to yield the predicted effect size. On the other hand, subsets of the data display a number of "significant" departures from expectation, suggesting structural anomalies.

There are many parameter combinations available in the Portreg protocol, however, and the appearance of "interesting" outcomes, given multiple opportunities, may be expected by chance. To address this issue, a Monte Carlo simulation was used to generate a comparison distribution of random outcomes for the entire matrix of experimental conditions. Criteria were set to identify structural departures of the actual from the simulated data, including the mean Z-scores, their standard deviations, the largest absolute Z-scores, and the numbers of Z-scores exceeding various thresholds. There are 124 overlapping subsets or parameter combinations in the database, and the Monte Carlo comparison indicates that the actual data do not show strong distinctions on any of these criteria. However, when we examine differences between subsets, for example, digital vs graphic feedback, male vs female performance, etc., nearly all of the selected indicators do show significant deviations from the Monte Carlo distributions. In contrast, the concurrent calibration data, processed in the same way, show no departures from expectation.

These results verify that there is anomalous structure in the database, with an associated *p*-value of 0.02, residing in the differences between the outcomes for optional, operator-selected experimental conditions. Although this analysis cannot identify directly any particular conditions, it points to the parameter differences that most likely represent anomalies in this database. Among these are the mode of assignment of intentions (volitional, random) and the type of feedback (graphic, digital, none). Pursuing this track, it is possible to identify "most favorable cells" representing a set of conditions that, overall, tends to produce the strongest or most consistent results. This result may be used to specify conditions for further experiments and might be considered for targeted analyses in extant databases, e.g., Portreg Phase 2, or an REG meta-analysis.

Comparisons of the three laboratories' results for the various parameter combinations show a striking correlation (*rho* = 0.65, which is marginally significant) between GARP and PEAR, and a negative correlation (-.45) between FAMMI and PEAR, while *rho* is near zero for the pattern of parameter correspondence between GARP and FAMMI.

An interesting series-position effect with strong first-series performance followed by a decline and subsequent recovery in the PEAR benchmark data was not replicated in any of the new databases.

Five operators had substantial databases in the original PEAR benchmark and the replication experiments, allowing a comparison of their internal consistency. Four of the five performed similarly, to a remarkable degree ($p = 0.995$). The fifth operator showed an equally remarkable "anti-replication" of the prior signature ($p = 0.003$). A more general examination of idiosyncratic operator contributions shows little indication of such except for a striking tendency for scores of the female operators at PEAR to cluster too closely to expectation.