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Editorial

We are pleased to present as a major feature of this issue the series of papers that formed the symposium on parapsychology led by Professor Robert Morris at last year's International Congress of Psychology held in Stockholm. Although there were several parallel sessions, the symposium was one of the most well attended at the Congress. These papers have a continued relevance in that they now provide a concise and convenient overview of the concerns of current experimental parapsychology. In line with this, Professor Morris's own paper is entitled Research Methods in Experimental Parapsychology: Problems and Prospects. It is characteristic of his approach to start with these anomalous experiences in general and then seek various normal, abnormal, and eventually even paranormal explanations for the different types of experiences he is able to specify. Naturally, in focusing on research concerning genuine paranormal experiences, high profile was given to the ganzfeld technique as a means of studying these with laboratory controls. This emphasis was appropriate given that the audience was composed mainly of professional psychologists and that the *Psychological Bulletin* has been a host to articles on the topic, beginning with Bem and Honorton's 1994 review of the ganzfeld work. Dr Jan Dalkvist presented a summary of the controversy and issues following the Milton and Wiseman review of the attempts to replicate the Bem and Honorton findings. Hopefully it is a measure of the quickening of progress that I have to alert the reader to papers which already attempt to empirically deal with the issues raised by the Milton and Wiseman database. These have appeared within the short duration of time that has passed since the Dalkvist review. Bem and Palmer reported an analysis of the post-1994 ganzfeld work where blind assessments of the outcome and the exactitude of each replication attempt were made. Their findings suggest that if the exactitude of replication is taken into account then much of the significance and effect size that had been thought to be missing from the Milton and Wiseman database is actually present.¹ Also subsequent to the symposium is a current publication in *Psychological Bulletin* by Lance Storm and Siefert Ertel². This paper looks at the ganzfeld database as a whole and makes various comparisons within this large database, all of which can be taken to be indicative of a robust and pervasive psi-effect.

My paper attempts to complement Dr Dalkvist's quantitative overview by presenting our current work at Gothenburg. This uses an improved ganzfeld methodology where the imagery reported by the receiver-participant while in the ganzfeld state, is digitally recorded in real time with the target film images the sender is viewing. The aim of this work is to use a combination of qualitative and quantitative data to localise the precise moment when the apparent psi-event takes place and enters consciousness and thus to identify markers of this. This and subsequent work should enable us to move the debate forwards towards that of developing and testing psychological theories.

¹ Bem, D. J., Palmer, J., & Broughton, R. S. (2001). Updating the Ganzfeld Database: A victim of its own Success? *Journal of Parapsychology*, 65 in press.

Currently available on line at: http://comp9.psych.cornell.edu/dbem/online_pubs.html.

² Storm, L., & Ertel, S. (2001) Does psi exist? Comments on Milton and Wiseman's (1999) meta-analysis of ganzfeld research. *Psychological Bulletin*, 127, 3, 424-433

It is sometimes said that real progress - or perhaps a real beginning – in terms of theory will only be made in terms of theory when findings from parapsychology serve to link cognitive psychology with physiology and physics. We are clearly a long way from this but Professor Deborah Delanoy presents in her paper an overview of the area of physiology known as “DMILS”. As cumbersome and ugly as this acronym is, it stands for the distance mental influence on living systems or, more simply, the attempt to activate or relax another individual’s physiological state by mental effort. She makes a strong case for the existence of such effects, which if real have an analogy with healing. However as she points out we have as yet no idea at all as how such effects might occur.

The contribution from physics was from Dr Ed May who presented findings relating psi to targets and environmental factors such as geomagnetism and sidereal time. The analysis of varying success with different types of targets is found to be indicative of psi functioning like other sensory systems in responding to rapid changes of stimulus field or gradient - a finding which is consistent with the Gothenburg work. Dr May also reports some recent findings on geomagnetic effects and sidereal time which although robust, remain little understood.

Even given the occurrence of the apparent robust effects reported by Dr May, our near total lack of understanding of the nature of these phenomena becomes the major impediment to the acceptance of parapsychology by psychologists. Recently a candid statement made by Tony Cornell at the 2001 International Conference of the Society for Psychical Research made this very clear to me. Tony Cornell, who is the probably the SPR’s most experienced and critical investigative officer, related how this experience has taught him there was something fundamental that we do not understand about the nature of spontaneous phenomena such as apparitions and poltergeists. According to Cornell, we cannot simply deal with the phenomena as either entirely objective, in being easy to document with instruments, or as illusory, in terms of artefacts, cognitive errors, or geomagnetic effects. In presenting his evidence for this, he highlighted the long historical tradition that surrounds haunting and poltergeist occurrences. In this respect Dr Annekatrin Puhle’s review here of unknown or forgotten poltergeist cases from the German culture of the 1700s takes on a current relevance in showing how we interpret these events depends in part on our conceptual and cultural-historical expectancies.

Anomalous experiences are multi-faceted and multi-determined and as Professor Morris’s review makes clear, the apparently genuine psi experiences are only a small part of these. The attempt to apply psychological measures to separate these out and illuminate the significance of the various types of experiences for personality functioning, is an area where parapsychology is making theoretical links with psychology. This ongoing work is represented in this issue by the contributions from Harvey Irwin, James Houran and Rense Lange, Anneli Goulding and Adrian Parker, and Lance Storm. In what has become a jungle of psychometric measures, one penetrating concept that all these contributions relate in some way to, is that of *transliminality*³. To some extent this is a modern version of the classical, but in psychology mostly forgotten work of F. W. H. Myers on the subliminal self (the

³ Thalbourne, M.A., Bartemucci, L., Delin, P.S., Fox, B., & Nofi, O. (1997). Transliminality: Its nature and correlates. *Journal of the American Society for Psychical Research*, 91, 305-331.

Unconscious as representing as a goldmine as well as the scrap heap of experiences). Now with the application of psychometric techniques, it should be possible to bring some empirical precision to the concept. Although it is first necessary to show transliminality is more than a form of fleeting test error variance, transliminality or some later variant of it may well offer a vista ranging from, at one extreme, psychotic-like experiences to, at the other, so-called positive schizotypy and creativity.

Adrian Parker

Research Methods in Experimental Parapsychology: Problems and Prospects

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Abstract: Parapsychology can be defined as the study of apparent additional natural means of communication or exchange of influence between organisms and their environments, beyond those we presently understand. Its research procedures are designed to look for evidence of such interaction effects under conditions reported to facilitate their manifestations. At the same time, such procedures must safeguard against a wide variety of possible artefacts. The main part of this paper will describe the general nature of those artefacts, including deliberate fraud, as well as the methodologies designed to circumvent them

The subject matter of parapsychology was first presented at *The Second International Congress of Psychology* held in London over one hundred years ago, by none other than Henry Sidgwick, one of the greatest philosophers of modern time. As far as I know it has appeared only once since then, in a paper by the founder of Swedish psychology, Professor Alrutz.

There is no formal definition of parapsychology. It has no legal definition; anyone can call themselves a parapsychologist, so let's look at the remit for the Koestler Chair of Parapsychology. How was it actually phrased in the Koestlers' will in such a way that the University of Edinburgh was kind enough to accept the money without too much trepidation? It was defined essentially as having the remit of furthering objective scientific research 'into the capacity attributed to certain individuals to interact with their environments by means other than the recognised sensory and motor channels'. This places it within a communication context. It is something that is attributed to people; there is no obligation to assume that it exists beyond the recognised sensory and motor channels, and it says nothing about whether or not such sensory and motor channels may come to be recognised in the future.

Basic Concepts

There are five basic concepts involved, ESP (or extrasensory perception) includes three subcategories. First is the notion of **telepathy** or distant feeling, in which there appears to be some sort of person to person interaction; one individual appears to be aware of the thoughts and experiences of another. There is the concept of **clairvoyance**, literally clear-viewing and clear-seeing, in which it appears as though there is information transfer or communication from an event in the environment to the person; someone seems to be aware of physical events, without access to presently understood means. Then we have the notion of **precognition**, literally pre-knowing, in which a future event or person appears to become known or appears to influence an individual; someone seems to be able to be aware of future events. In each of these

cases it is as though the individual receives information or influence from events in There is also within parapsychology the notion of **psychokinesis** or PK, in which it seems to various observers that an individual appears to be having an influence upon the environment without access to presently understood means. Those are the basic terms, the basic concepts.

Interpretations of Anomalous Experiences

Now then, how do we apply the tools of science to try to investigate this? One thing we can do is to try to look at the groupings of explanations for anomalies, for anomalous experiences. We can identify at least twelve different kinds of interpretations of anomalies, as shown in table 1:

Table 1 Interpretations of Anomalies

1. Coincidence
2. Poor observation.
3. Poor interpretation of observation.
4. Poor memory storage and retrieval,
5. Self-deception.
6. Deception by others
7. Functional distortion of biological processing
8. Hidden causation.
9. New application of existing principles
10. Additional natural causes
11. Causes beyond nature
12. Supernatural events

The first ten all have to do with interpretations placed within the context of what we presently know and understand. Number one is the notion of **coincidence**. Occasionally coincidences will happen; it would be amazing if they didn't. If we are at one of the tail ends of the chance distribution, we may be amazed at the coincidences that have just taken place. We are notoriously poor evaluators of the likelihood that X event might occur simply by chance alone. Our second category is the notion of **poor observation**. Sometimes we simply do not notice everything going on around us that might have provided us with a little cue about what is actually happening. As a result, if we are not able to observe very well we may miss out on crucial causal links that might potentially connect two events that ostensibly have no business being connected. Third is the problem of **poor interpretation of observation**. We may make observations and simply not be very good at interpreting them; we don't have quite enough background knowledge. Fourth, we may have problems with what I am calling **poor storage and retrieval**, two essential components of memory; we may not remember things very well or accurately. The fifth notion is **self-deception**. We are all excellent at self-deception, we do it daily and it gives us all a good time now and then, it helps us essentially to propagate beliefs for our use which may flatter us, and may support a belief system that helps us

organise the world. Number six, which we will hear more about in a bit, is **deception by others**. There has really been very little work done on the nature of deliberate deception, and it recently has become one of the important components of work in parapsychology. Number seven is **functional distortion of processing**. This just means that as we take information in from the world around us, if in fact we have extremely strong views, we may actually distort the ordinary, usual process of bringing information in, translating it, understanding it and so on. Such people may often perceive the world differently from those around them. Number eight, closely related is **biological distortion of processing**. It can be due to such factors as lack of sleep or drug intake. The fact that the brain sends signals down to modify input as it is coming in, can contribute to both kinds of distorted processing. Number nine is **hidden causation**. Sometimes there is a cause, an explanation for the anomalies that we see; but it is hidden. It is more than something that we didn't observe very well. The causation is really concealed, shielded from us intentionally or unintentionally in one way or another. Number ten is a **new application of existing principles**. In this case we have a circumstance in which science may know quite a bit about the way the world works but we don't always apply that knowledge to new situations. Sonar was understood a means of physical communication prior to our discovery of its relevance for animal communication.

These first ten are regarded as well within the province of ordinary science. Parapsychology comes within the eleventh one: is there the possibility of some new, **additional natural causes** that can still be found to contribute even after we take into account these first ten and any others that I have left out. Parapsychology as we define it is essentially part of natural science. We are looking for laws of nature, we are looking for regularity, we are looking to extend the corpus of existing scientific knowledge, not to confront it or fly in the face of it. What about number twelve, **causes beyond nature**? We would argue that we have very little to say about this other than an in an exclusionary way. We try to take the first ten into account and to see whether or not they can account for what would appear to be evidence for ESP or PK or some new means of communication. Then we try to take all eleven into account to see whether or not they may also account for events that have been taken as evidence for something literally beyond nature; as **supernatural**. We would argue that it is very difficult to build a case in a scientific way for the existence of something beyond nature. We're good at finding out what belongs within nature; at any given time there may be things left over, that seem to be quite chaotic, not looking as though there are rules or laws of nature involved. In any particular case all we could say is that given our current level of observation and interpretation, we haven't yet spotted any pattern suggesting lawfulness. But we cannot then draw the inference that we will never spot such patterns, and there are many examples which were previously regarded as supernatural or miraculous which now have yielded to science and have more conventional interpretations.

An Observer-Centered Model

To help us organise our research, both our descriptive research and our experimental research, it is useful to try to develop models of one sort or another, of what happens when an observer draws an inference that some new means of communication may have taken place. I will preface this very briefly by simplifying the notion of ESP and PK once again. Psi is often a term that is used to incorporate the two of them. For ESP it is as though some sort of source of influence in the environment conveys information or influence to an organism that serves as a receiver, despite the presence of barriers which should prevent or preclude all such means of information transfer. For the notion of PK or psychokinesis this communication process, if you will, is reversed. Now it seems as though an organism is imparting influence or information to some sort of target event in the environment, once again despite the presence of barriers which should prevent or preclude all presently understood means of communication transfer.

We can elaborate on this a little bit to develop an observer-centered model. Let us consider an observer observing different components in a complex system. This can be an experiment, or a naturally occurring set of events. I can illustrate these different components by generating a simple anecdote of the sort that is periodically sent in to us. Suppose that one evening one of my daughters suddenly became extremely upset and distressed, and felt that her boyfriend had just had an accident, shortly after nine o'clock. She had an experience, it was crudely measured and recorded or described as she communicated it to us. About eleven o'clock that night in came a telephone call from the boyfriend's parents telling us that earlier in the evening he was in a car crash; there were eyewitness accounts, it was measured and recorded as happening shortly after nine o'clock. So it looks to the observer that there seems to be a linkage between these two events, or certainly between the two descriptions of them. These two descriptions tended to resemble each other to a meaningful extent in a way that appeared to go beyond simply what you would expect by chance. And please note that if my daughter had anxiety attacks most evenings or if her boyfriend had car crashes most evenings this would be a less impressive coincidence. The more unusual each of these are, the more interesting and impressive the coincidence is. These are the features that would lead us as the observer in any kind of system to say it looks as though there is a linkage that would be silly to ignore.

Now, what about the system may lead us to the possibility that there is some new means of communication going on? This is where barriers come into account. It looks to us as though there are barriers which should prevent real-time cross-talk. It is a good anecdote if for instance there is some distance or sensory shielding in between experiences and events so that there could not be cross talk between them. It is impressive if in fact those barriers extend to the two acts of describing; if one of these can be influenced or informed by the other, of course they may naturally therefore tend to resemble each other. The most complex are the sets of antecedent factors that could lead to the experience or to the accident. These are sets of factors which sometimes are very difficult to draw a nice tidy circle around. In systems terms we

say they may be open systems. It is very hard for us to identify all of the different events that might have affected my daughter's experience and it is very difficult to specify all of the events that might have affected the car crash. Suppose the experience happened quite some distance away, her boyfriend was driving in perfectly good weather in a safe automobile, and in fact the accident was caused by swerving to avoid a small furry animal that just darted out into the road. We might say that is a fairly closed system, not likely to overlap with whatever system of factors contributed to my daughter's experience. On the other hand suppose that my daughter's boyfriend was over at our house earlier in the evening, and they had an argument shortly after seven o'clock. He stormed out of the house, slamming the door behind him saying, he never wanted to see her again and that he was going to go down to the neighbourhood pub, get completely rip roaring drunk, and then take the long winding mountain drive home, in the face of the oncoming blizzard. Now, these two sets of factors have overlapped. Depending on how sophisticated her knowledge is about his pub behaviour, she may come pretty close to getting the exact time right. So, this anecdote illustrates the kinds of interactions amongst different sets of factors that should be taken into account in a system being observed by an observer who is trying to piece together which of these components are able to interact with each other. The more conventional interactions they have the more likely it is that there will be a resemblance and that it will have an ordinary interpretation.

If we go beyond this system of potential interactions, there are additional difficulties. The observer may have problems getting good information out of the system. For instance, the information may be obscured from the observer, accidentally or intentionally by a clever fraud. Or indeed, information may simply be inaccurate; it is taken as accurate but it is not. Or the information may be misperceived; it starts off being valid information but due to accidental or intentional capitalisation or distortion in our perception, in fact the information as perceived is simply no longer good information. Or the information may be correct from the system; it is good information but the observer's attention is diverted, either accidentally or intentionally via clever fraud. Or the information may be misinterpreted; it arrived but it is interpreted improperly. A clever fraud may help us to frame things in such a way that we are all set to interpret things in one way and we should have done it in another. And finally sometimes the information may arrive successfully and be interpreted properly at the time but then is mis-remembered. Each one of these can happen accidentally or can be the result of deliberate fraud.

A Specimen Experimental Procedure

Given the above considerations, how do we go about designing and conducting our research, such as to rule out alternative interpretations? Various examples will be provided later in this symposium, but I would like to illustrate by describing a particular kind of study, involving a "free response ESP" procedure.

In **free-response studies** the target could be almost anything such as a picture or a sixty second long video clip. Participants are told they are free to respond in whatever way they want. They can generate imagery or impressions for a period of time. After they have done that, they or perhaps another judge is given a set of choices. We may

show the person four pictures, or show them four video clips, one of which is identical to the correct one and then ask to them to rate the extent of correspondence to each of these four possibilities. They and the experimenter are of course blind as to which of the four is the actual target. We can then see whether or not participants consistently rate the correct one higher than the incorrect ones even when we hopefully have eliminated all possible means of information transfer from the target to the individual.

I would like to illustrate with one particular line of research. Certainly one of the things that would have to be evident to everybody here is that if there is anything new going on, then it is not something that is so evident, so easy to obtain that we can say to participants 'why don't you come into our laboratory and be psychic between four and four-thirty next Thursday afternoon'. If it were that easy we would have known it quite a long time ago. So either it isn't that easy and we have to be able to understand what special circumstances are needed to produce psychic effects; or else we are fooling ourselves in increasing sophisticated ways. In either case, by continued scientific research we will learn something interesting. One strategy is to try to take a look at some of the anecdotal claims emerging from the spontaneous cases, from different cultural groups, even from psychotherapeutic case studies and see what kinds of themes and patterns run through them. This has been done by many researchers in the past, and, for instance, led to the noise reduction model of Honorton (1977) and others. This, in turn led to different kinds of controlled laboratory research on ESP in dreams, hypnosis versus control conditions, meditators versus non-meditators, relaxation versus control and so on. These different lines of research in turn seemed to have certain commonalties, in that the results seemed to be better whenever there was physical relaxation and reduced sensory processing, yet sufficient cortical arousal so that the person was able to respond in some way or another.

The resulting noise reduction model argued that ESP may represent one or more communication systems that are ordinarily crowded out by those that we presently understand. This in turn suggests that we should employ sensory deprivation procedures. The most frequently used is the Ganzfeld procedure in which a person would have headphones on that might play them white noise or pink noise or sounds of seashore; they would have table tennis balls fixed over their eyes and a diffuse light source about a metre in front of them. It puts one into the kind of state that we would be in if we were lying out on a comfortable air mattress by the seashore hearing the waves with our eyes closed and the sun bathing us in a kind of reddish or pinkish hue. It is very relaxing and conducive to imagery. The idea was that by using such a procedure we could essentially turn the participant's attention internally and help them to avoid being distracted by presently understood external sources of information. Several studies were done with this procedure. However, there were certain kinds of flaws and problems that were occasionally coming up in these studies, as will be seen later in this symposium.

Berger and Honorton (1986) designed a procedure to do the best job possible of addressing these problems. The sender was in an acoustically shielded room, as was the receiver, with the experimenter console between them. A video tape system was controlled by an automated procedure to select one of several pools of four targets, then within that pool one target sixty second film clip, to project to the sender. The receiver at the same time would attempt to generate imagery and describe it out loud.

The experimenter would hear the description through headphones and take notes on it; it would be tape recorded. After that had been done for almost half an hour then the receiver would be shown by the computer all four possible film clips and then would make a judgement about which of the four film clips was thought to be the correct one. The experimenter would interact with the receiver somewhat, but try not to guide them and also was blind to the actual identity of the target until the judging was completed and the ratings entered into the computer. The whole thing was set up in an automated way. They got fairly strong results in this set of studies, especially with pools of dynamic targets where the film clips depicted events rather than static images (Honorton et al., 1990). They had a forty percent hit rate with those and much less with the static targets; the difference between these was significant.

But that automated Ganzfeld procedure as well was challenged, as will be described later in this symposium. At the University of Edinburgh we tried to follow up on this work with an improved procedure (Morris et al., 1995). We had greater separation between the sender and the receiver, we had two sets of videos, we had the experimenter not at all in the same room as the video equipment so there was no possibility of subtle cueing. We only used lab staff in our main study as the senders, to try to eliminate the possibility of some kind of signalling device between sender and receiver planning to cheat and so on. In this study we were trying to see whether or not it mattered whether there was actually a sender. We had ninety-seven trials, thirty-two in each of three conditions. As participants were assigned to conditions randomly, one of these wound up having an extra one to it; we kept for the purposes of comparing conditions the first thirty-two in each condition. Overall, we had a thirty-three percent hit rate, just barely statistically significant. We found no real difference whether there was a sender or not. There were experimenter effects in that one experimenter tended to get better results than the others. We tried to address the possibility that this experimenter was cheating and without her knowing it modelled several ways that that might have happened, with additional kinds of judging, with looking at the characteristics of the targets that were selected and so on and didn't find any support for that model.

This individual, Kathy Dalton, continued with another study which was looking at different kinds of creative groups (Dalton, 1997). According to the literature, musicians especially and creative groups in general tended to do fairly well in free response studies. She had a total of one hundred and twenty-eight separate sessions of which forty-seven percent of the time the receiver got it correct, which is quite unlikely to occur just by chance. Musicians and artists tended to do the best, creative writers and actors not so well. These differences are not significant in themselves, suggesting that these were very good groups of people to work with.

The Dalton study provides an example of a well designed study that also obtained very positive results. Later in this symposium you will hear more about the ganzfeld procedure and other studies that have used it. Individual studies, however, can always in principal have some alternative interpretation including some that in principal may be unfalsifiable: chance, undetected participant fraud, experimenter or investigator fraud, undetected procedural flaws, inadequate description of experimental procedure, file drawer problems and so on.

Deception Research

As one of the major alternatives is deliberate deception by one or more of those involved in a study, part of our research involves generating a further understanding of the general nature of deception as well as the specific strategies often used to simulate psychic functioning.

Some of my colleagues and former students such as Richard Wiseman and Chris Roe, and now Peter Lamont working with us (e.g., Wiseman and Morris, 1994; Lamont and Wiseman, 1999), have tried to work with us and to develop theoretical systems to describe and understand deception. Some of the different kinds of research have involved looking at **physical effects**. There are many different ways to make something vanish, or suddenly appear, or two things to change places, or one thing to transform into another, or one thing to be destroyed and then brought back again. There are slightly fewer ways to levitate, to simulate anomalous attraction and so on. We also can consider **mental effects**. Simulating psychic powers has been big business. There is specialisation within the magic community; mentalism is one particular kind. It includes both simulating psychic powers and also other kinds of mental abilities. There is a sizeable literature on how to be a very rapid calculator and sometimes people will attempt to persuade you that they have **unusual mental abilities** because they can do their sums very quickly. Some of the research involves how information is presented to observers and whether or not if there is a distortion it occurs during the process of observing itself or whether it occurs in the course of remembering, reconstructing after the fact what happened. We investigated problems in both the initial observation and also the reconstruction from memory (Wiseman and Morris, 1995). We also try to understand the **processes of negotiation**, how it is that a magician or perhaps a real psychic may attempt to modify the rules of the game after the fact, to renegotiate exactly how we are going to judge whether or not something is genuinely psychic. There are also **psychic reading techniques** which I will cover below. This is big business and has been for hundreds and possibly thousands of years. Regarding **confidence artists**, sometimes people are not necessarily good magicians but they are excellent at gaining your confidence quite literally. They may look a little bit like a fraud but they are such a nice person, and then they have your wallet. **Evaluating archives** can come to be an art in itself. Often we have an archival description of a set of events that happened in the past, so part of what we are trying to do is to study different ways of unpacking that description to find out what more should have been said, to make a slightly richer picture so we can evaluate the prior events more completely. The **socio-cultural context of deception** sometimes can involve attempts to gain power. That power can involve large scale societal factors or simply the dynamics of a married pair.

Part of what we are also trying to do in our own work is to devise models, once again for deception. Within psychology we have schema theory. It basically talks about the ways that we come up with schemata, to represent the way the world works. Pseudo-psychics can often capitalise on this; they know what an observer's schemata are likely to be and they deceive more in terms of our sophistication than they do our

ignorance. Most deceivers would like to know what you are good at; then they will know how you are going to interpret what you observe and they can set you up better. We also are trying to use a systems approach as you have already seen to a certain extent, to draw comparisons between the different kinds of models for pseudo-psychics, for stage magicians, for deceptive advertising, for military deception and so on, and also trying to look at deception from a communication standpoint. There are many different kinds of conceptual issues that arise in the study of deception, for instance the study of whether or not it can occur in non-humans or in infants, what the difference is between conscious and unintended deception and so on.

Some of the work that has been done is on so-called psychic reading techniques, some of the different strategies that colleagues like Chris Roe have been able to articulate, with regard to how somebody may persuade you that they have psychic knowledge of you (e.g. Roe, 1995). Many people do **advance scouting**. If you write a cheque for somebody's services in advance, there are up to eleven different pieces of information that can be gleaned from that cheque, not the least of which is your home address, which allows them to do a bit of advance scouting. They will be remarkably accurate in saying exactly what colour your drapes are. We tend to shy away from **population stereotypes** but they do exist in a crude sense and many people became quite sophisticated at them. A book called "*Passages*" by Gail Sheehy became one of the big favourites, especially of American pseudo-psychics, because it was all about what kinds of crisis you have given your sex, your gender, your age, your cultural milieu, your socio-economic indicators and so on. Fakes know about **interest areas**; there are certain interest areas such as health, money and love that capture us all the time and part of being a successful reader is knowing what kinds of topics to discuss. Then there are **Barnum statements**, essentially statements which sound to each of us as though they are unique to oneself. But everyone else thinks the same thing about themselves too. Such statements can be persuasively given to most people. They often have a sort of two-faced category: "On the surface you seem to be regarded by many as not caring too much, but deep inside you're really very vulnerable". **Generality and feedback** is another strategy. Pseudo-psychics can make a general statement, get feedback and then reintroduce it later on with more specificity and people will remember just the specific statement but not that it was guided by the general statement. **Fishing** is the strategy of giving information to a client in order to get information. **Setting up repeaters**, in the language of many of the confidence artists, refers to setting clients up so they need your services and will come back again and again and again. **Reinterpretation after the fact** is a very important problem. Often the rules will be changed after the fact, 'Yes, I said there would be an accident in the East and what I meant by that was the East coast of that country; and so on. In addition, it is important to understand the **characteristics of clients** that enable such techniques to be applied effectively with them and the **characteristics of psychics** that enable them to deploy these techniques effectively.

The Clinical Relevance of Parapsychology

The relevance of the various research areas of parapsychology for psychology can be summarised by considering the interests in our work expressed by students in a seminar I conduct once a year for advanced clinical psychology trainees. At least eleven distinct areas have so far emerged:

- 1) **Norms for experiences.** In different cultures, what kinds of experiences are common that would be anomalous in ours?
- 2) **Acquisition of beliefs.** How do people form and maintain beliefs and attitudes about their own experiences?
- 3) **Evaluating specific experiences.** Can we develop models to help counsellors and clients evaluate specific experiences?
- 4) **Personal importance of experiences.** Why do some experiences appear to have very favourable consequences for the experiencers and others very unfavourable consequences?
- 5) **Helping re-evaluation of experiences.** How can counsellors help individuals re-evaluate their interpretations of experiences, e.g. through cognitive intervention strategies?
- 6) **Understanding deception.** What are the tricks of the trade used by confidence artists and pseudo-psychics? How do psychic readers compare with traditional counsellors?
- 7) **Evaluating apparent strong evidence.** How can one evaluate events that appear to provide strong evidence for some sort of communication process well beyond those we presently understand?
- 8) **Current status of parapsychology.** What evidence is there for the various new capacities attributed to people?
- 9) **Other practical considerations.** What specific techniques can be used to help clients deal with their fears and concerns about their experiences?
- 10) **Cult involvement.** What do we know about the techniques used by cult leaders to exert control over their clients and persuade them of their powers?
- 11) **Dissociation.** What do we know about dissociation states and the experiences reported during them?

Thus parapsychology hopefully can contribute to understanding the various forms of evidence for and against the existence of new means of interaction between organisms and their environments. We are studying complex systems and looking for their properties and the mechanisms involved. We are attempting to avoid both false positive and false negative errors, as both are misleading when committed. The following papers in this symposium will provide more specific details regarding recent research methods and findings in parapsychology.

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The Ganzfeld Method: Its Current Status

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Abstract: A brief overview is given of the theoretical background to the use of the ganzfeld technique and an assessment is made of its current status as a replicable means of producing psi-effect in the laboratory. A presentation is made of the issues arising from the Milton and Wiseman review of the work done since the Berm and Honorton 1994 paper.⁴

The so-called ganzfeld technique is a modern method for studying extrasensory perception, in particular that of telepathy. The method is based on the old idea that various altered states of consciousness such as dreams and trance are conducive to *psi*-experiences. According to the working model lying behind the ganzfeld method, this is due to a reduction of the noise produced by our ordinary senses, sight and hearing in particular. Reducing this noise should therefore increase the relative strength of the assumed *psi*-signal.

The original ganzfeld technique was exclusively a procedure for studying telepathy using visual information. As we shall see, however, in recent years the technique has sometimes been more diversified.

A typical ganzfeld experiment involves two participants – one sender and one receiver, who are located in different sound-attenuated rooms. The receiver is subjected to a mild form of perceptual isolation. He or she is sitting in a comfortable chair with Ping-Pong ball halves placed over the eyes and headphones over the ears. A red light is directed at the eyes, creating a homogeneous visual field – a visual ganzfeld. White noise, or some similar monotonous sound, such as the sound from the sea, is played through the earphones, creating a homogeneous auditory field – an auditory ganzfeld. In addition, the receiver is often but not always given relaxation instructions in order to minimise somatic noise.

The sender is then shown a target such as a photograph or a video clip randomly selected from a large pool. The sender attempts to transmit the target stimuli (chosen randomly from a series of pictures or slides or nowadays from film clips) to the receiver, who continuously reports the images, sensory impressions and feelings that come to his or her mind. This part of the procedure goes on for about half an hour. The receiver is then shown four stimuli in a randomised order. One of them is the target. The remaining ones are decoy stimuli of the same type as the target pool. The receiver examines each stimulus and estimates how well it matches his or her experiences while being in the receiving state. A hit occurs when the target receives the highest rating or ranking. By chance alone, this would happen 25% of the time.

An impressive amount of positive results were reported in a first wave of ganzfeld research. In 1985, however, Ray Hyman, who is a sceptic of parapsychology, published a meta-analysis of 42 ganzfeld studies conducted between 1974 and 1981.

⁴ See the Editorial for an update on this.

His general conclusion from this analysis was that the positive findings could be accounted for by various methodological flaws. In response, Honorton conducted a parallel meta-analysis, comprising 28 of the 42 studies reviewed by Hyman: those for which *direct* hit rates were reported. This meta-analysis showed the overall results to be very strong, with a mean hit rate of 38% and a p -value around 10^{-11} . Honorton's conclusion was that the flaws identified by Hyman were not serious enough to overthrow the results.

The debate ended in a constructive way with, Hyman and Honorton in 1986 releasing a joint communiqué. Still disagreeing on how the existing ganzfeld results should be interpreted, they recommended the use of a set of more stringent procedures for future ganzfeld studies.

In 1994, Daryl Bem, a well-known social psychologist, and parapsychologist Charles Honorton reported a series of new ganzfeld studies, closely following the guidelines agreed upon by Hyman and Honorton. The 11 studies were partly automated; consequently, they were referred to as *autoganzfeld* studies. Another innovation was that not only stills but also video-clips were used as stimuli. The results of the new studies were clearly significant, and the mean hit rate was only slightly lower than before: 35%.

How did Hyman react to these results? He recognised that the autoganzfeld studies complied with most of the stringent standards spelled out in the joint communiqué by himself and Honorton, but not that the studies complied with all of them. Hyman's main criticism was that the randomisation procedures had not been adequately tested. This criticism was nevertheless challenged by Bem. (Sadly, Honorton had died by a heart attack in 1992, at the age of 46.)

Another criticism came from Wiseman and two co-authors – Mathew Smith and Diana Kornbroth. They suggested that there might have been some leakage between the two rooms containing the sender and the receiver. No hard evidence for such a leakage was reported, however.

Whereas the general opinion was that the autoganzfeld studies confirmed the previous ganzfeld results, the resultant enthusiasm over that progress had been made was soon tempered and turned into an intense debate which still persists today. This resulted from a new meta-analysis of some 30 additional ganzfeld studies in 7 different laboratories published in 1997 by Julie Milton and Wiseman. The new meta-analysis failed to confirm the positive findings from the previous ones: the mean hit rate had dropped to 27% only; the mean effect size was close to zero; and the cumulative results did not reach significance.

Why did this happen? There are two different interpretations of the failure to replicate the previous positive results:

- (1) Previous positive results were methodological artefacts after all.
- (2) The conditions of previous positive results were more conducive to *psi* than the conditions of the new ones.

In order to evaluate these two interpretations, Milton and Wiseman made an attempt to compare the autoganzfeld studies with the new ones with respect to five factors which Bem and Honorton had assumed to be *psi*-conductive: extraversion, reported *psi* experience, target type, belief in *psi*, creativity and social ambience on the part of the experimenters. Unfortunately, relevant data were in general lacking. There

is some suggestion, however, that the autoganzfeld subjects may have been especially creative, and, perhaps more importantly, that Bem and Honorton paid unusual attention to promote a warm social ambience.

It must also be mentioned, however, that a large part of the new ganzfeld experiments differed from the previous ones, either by using auditory instead of visual stimuli or by dropping the use of the sender in all or some trials. It may thus be argued that Milton and Wiseman did *not* test how replicable the more genuine ganzfeld method is in producing *psi*-effects. Moreover, if four studies which were completed but not published when Milton and Wiseman prepared their report had been included, the overall results would have been significant. Nevertheless, the fact remains that the strong results obtained in the previous meta-analyses did not reappear in the Milton and Wiseman meta-analysis. Hopefully, the reason for this decline will be clarified in future ganzfeld research.⁵

One approach in the future ganzfeld research will certainly be to continue collecting ganzfeld data in a traditional way, following the guidelines suggested by Hyman and Honorton more or less strictly. In due course, this approach will lead to new meta-analyses being conducted.

Another, perhaps more exciting approach, is to try to improve the traditional ganzfeld method. This can be done, for example, by trying to make the method maximally *psi* conducive. Another approach would be to better utilise the mentation reports from the receiver. Both of these approaches have been taken by Adrian Parker at the University of Gothenburg.

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The Ganzfeld: Suggested Improvements of an Apparently Successful Method for Psi Research

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Abstract: The ganzfeld method is a laboratory analogue of spontaneous psi-experiences. Meta-analyses show the ganzfeld to have a promising track record of success in psi-research. Our current research has the goal of improving its effect size from the present level to reach an effect size where rapid progress can be made in terms of theory development. To achieve this goal we make use of audio-recordings of the ongoing verbal report of ganzfeld imagery which are fed onto a copy being simultaneously made in real-time of the video-clip. The video-material is currently being recording digitally and the procedure is run from the computer's hard disc. Some progress has already been made and suggests psi-imagery is directly perceived but subject to top-down processes.

My research contribution to parapsychology has been for many years linked to the Ganzfeld technique. While a doctoral student I helped pioneer one of the first applications of this technique to study of telepathic type experiences in the laboratory. However for many of the interviewing years I became rather sceptical and as an armchair critic my main contribution during this period was in helping to discredit the more extravagant claims being made for this technique by a then well-known Cambridge University researcher (Parker & Wiklund, 1987).

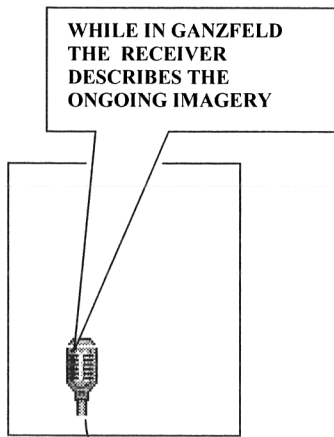
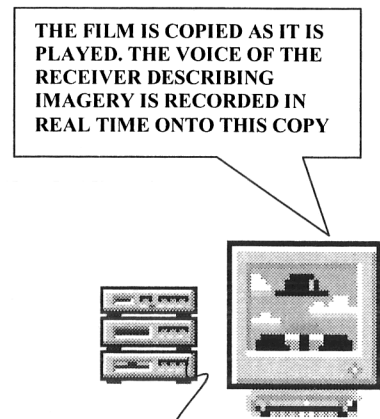
During the last four years, thanks to the generous support of the Bank of Sweden and some small additional support from the Perrott-Warrick fund at Cambridge, I have been in the position of being able to try to unite the two sides of myself which I suspect are well represented amongst the psychology profession: One side says that these phenomena are cognitive illusions due to confirmation bias, selective memory, or even in some cases schizotypal thinking, and that research has only succeeded in replicating methodological errors. The other side is impressed by the way parapsychology has been subject to constant critical evaluation and methodological refinement and yet the phenomena have persisted both in real life and in the laboratory. To dismiss this area would leave little faith in psychological research in general. So what have we been doing with this project and what have we found? The aims of the project can summarised by three "Rs" which were the remit for the first project:

- Replication at a high level
- Research towards a theory
- Recipe for success

We are now primarily preoccupied in our contemporary work with a fourth:

- Renewal of the ganzfeld technique by digitising the procedure.

But I will return to this aspect later. The basic set up is shown in figure 1.

Figure 1 Video Ganzfeld**RECEIVER ROOM****SENDER ROOM**

The results of the first project are summarised in table 1.

Table 1 Overall Results

Study	Trials	Hits	Frequency	z score	Effect size
Study I	30	6	20%	- 0.84	-.15
Study II	30	11	37%	1.26	.23
Study III	30	11	37%	1.26	.23
Study IV	30	14	47%	2.53	.46
Study V	30	12	40%	1.69	.32
Data Base 1-V: all studies $p = .0012$ one-tailed	150	54	36%	3.02	.25
Data Base II-V: monitored studies $p = .0005$ one-tailed	120	48	40%	3.69	.34

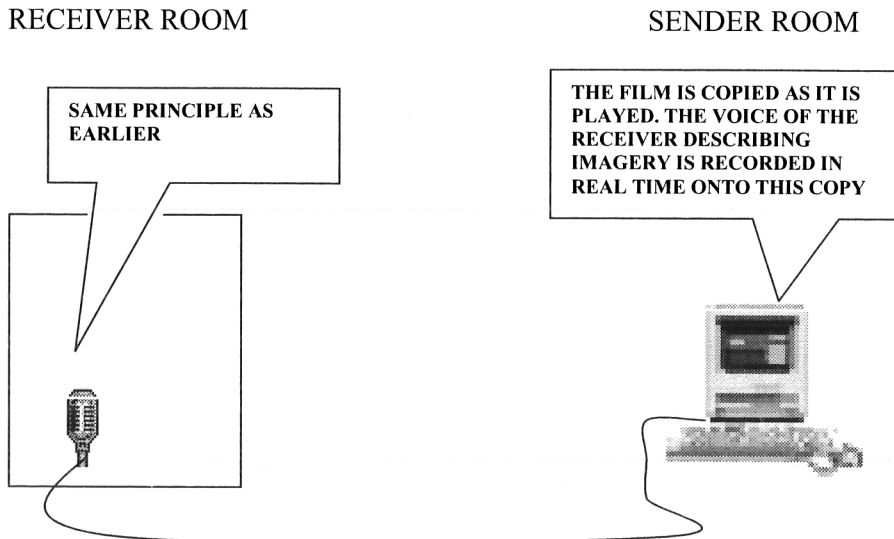
Whatever caused these findings it is clearly consistent and is not chance. There are good reasons not entirely post-hoc ones for considering the so-called monitoring studies separately. In these studies the sender could hear and follow ongoing the verbal report of the person in the ganzfeld state (through a one-way only communication) – a form of feedback for efforts. How did we do it? It is clearly important to know when there are still so many replication difficulties in parapsychology. There is undoubtedly an experimenter effect and although some of our results were not dependent on one experimenter, they did show clear differences between experimenters (Parker 2000b). Some of these differences appear to relate to choosing the right sort of participants to work with (Parker, Frederiksen, Johansson, 1997). From various measures and observations, we arrived at a rough recipe for success:

- Use individuals or groups who report spontaneous ESP type experiences
- Use individuals with a strong belief in ESP (for example high scores on the *Magical Ideation Scale* and the *Australian Sheep-Goat Scale*).
- Use individuals with high scores on *Myers-Briggs Feeling* (in need of replication).
- Create an expectancy of success and good relationships between all involved in the experiment.

But are we merely replicating ESP in its more derogatory form: "*Error Some Place*"? Could sensory leakage, faulty randomisation, or even fraud explain the results? Of course this is still possible even if it is unlikely given the size of the effect. It should be made clear that although this was not proof orientated research, we took the elementary precautions which are now obligatory in serious parapsychological work. (The receiver was a sound attenuated room distanced about 30 metres from the sender room, film clips were selected randomly, duplicate target films were used for judging).

About two years ago I had a discussion James Alcock, one of the most well-known critics of parapsychology (Alcock 1987). We found ourselves surprisingly agreed as to how we should resolve this dilemma of not being able to dismiss all the evidence but not being able to accept its implications. The way forward was to abandon the search for proof in a test tube and go for finding clear causal relationships with psychological events. If psychic phenomena are real and not illusory they will show these relationships.

In order to do this the first step is to identify periods of what appear to be pure psi and study how the material comes into consciousness. Here qualitative studies of the imagery formation during such periods can have an initial role. We are able to find such periods by recording the ganzfeld imagery in *real time* with the film imagery. We do this as shown earlier in figure 1 but also in our new set up in as shown in figure 2 where we have digitised the whole procedure so as to steer all events from and record all events on the computer. The audio-recordings of the ongoing verbal report of ganzfeld imagery are fed onto a copy being simultaneously made in real-time of the video-clip. The clips are short about 3 minutes in our older set up and 2 in our new set-up.

Figure 2 Digitised Ganzfeld

Major advantages of this technique include not only portability and safeguards but the actual judging procedure is also facilitated. The verbal report is heard and matched against both the real target films and the decoys shown together (displayed two at a time) on separate parts of the large 22 inch computer screen. This simultaneous viewing and comparison with the verbal report should facilitate the discrimination of which is decoy and which is real.

Some of our qualitative material appears at first face to be rather impressive. The "girl in the forest film clip" is consisted one of our best. The recording shows quite clearly how the ganzfeld imagery appears to follow the changing and unexpected imagery of the film clip about a girl being chased in the forest to the point at which there is an exact synchronicity between when the film sequence shows and the recipient describes that "the girl falls and hits her face on stony ground". The film itself is a very rare one and has little or no sound (cutting out the possibility of any remote auditory cues). The verbal description given in ganzfeld not only contains sequentially correct descriptions but these are correctly given in real time with a strange content that is not easily guessed: the "boomerang" shaped stick, the coloured effects of the wigs worn by the women, and the snowing effect in the film.

The same subject was able to repeat her performance with another film clip. This shows a man staring at greenish rocks in which an imp-like figure is hidden. At this point in time she responded: "Ivy covered rocks. There is something lying in them". What is also interesting here is that the participant apparently goes on to focus on the

improbable sequence of events that occur after this in the clip: a boy getting up from a blanket or sleeping bag to which she responds: "blanket or sleeping bag".

Could such effects occur by chance? Are the hits merely reflecting popular themes in human imagery relating to for example nightmares of being chased in the forest and dreams of flying, etc?

To get a correct perspective on this question, it should be emphasised that:

- 1 in every 5 or 6 of hits shows a remarkable degree of correspondence in content.
- Participants had no prior knowledge of the films being used and some good quality hits were obtained with rare films.
- Control recordings do occasionally show correspondences of the receiver's imagery with popular themes (such as water, cars, nature scenes, and people) but not the specificity that occurs here.
- The receiver's imagery in real-time recordings appears to follow the sudden changes in the content of the film. We have not found this to be the case in control recordings.

These results were recently presented at the Perrott-Warrick Conference held in Cambridge (Parker 2000b). Some critics there suggested that so-called the concept of "**subjective validity**" – that is a confirmation bias in seeking sufficiently far until matching sequences appear by chance – would explain these effects. This ignores of course the fact that the results are overall statistically significant and therefore this justifies looking for the source of the significance. Moreover, we had already looked at some sample control recordings in order to see how easy it is to get such matches in a row in the same film. In these the external judge looked for matches between the participants' statements about the film clip while viewing all four films without knowledge of which of these was a real time recording. Looking at one of these hits, we see that the participant correctly describes several features in the short clip about the releasing a wounded bird that has been held in captivity. She describes in real time "the feeling of flying", "having raised arms", "the breast of a bird", and then "flying towards the blue sky". This hit was actually not considered to be one of our best and was not one of those we have included in our collection of best hits (Parker et al 2000). One reason for this was there seemed to be a lot of "noise" – that is also a mass of vague statements – in the record until suddenly it seemed to match the target film. Nevertheless separating all the utterances into separate meaningful descriptive units, we found that some 10% of such units were rated by the judge at 8 or 9 on the 0-9 rating scale measuring the degree of correspondence. By way of contrast all the three control decoy films received only matches that lay between 0 and 2 on the scale with the exception of one single unit with a rating of 6.

There is however one difficulty in drawing conclusions from the use of such control recordings. There can be a dependency between meaningful units: having correctly described a forest or city scene then a lot of things might follow. Even the example here of the flying bird may show some of this kind of dependency – having correctly identified with a bird much of the rest might easily follow. Obviously it is not birds, trees or cars that we find to be impressive, but the correct description of unusual events which are actually an important criterion for selecting films into our film library. These can serve as parapsychological markers of psi.

We need a method of dealing with this quantitatively. Recently my co-worker, Dr Joakim Westerlund, has found an ingenious method which at least to some extent resolves the issue of, so to speak, "how to quantify the qualitative". The method involves collecting a complete record of time recordings from a whole experiment which includes both the real time recordings on to the target films and the same recordings made on to the three control decoy clips. All of these recordings are then systematically looked through by an independent judge who tries to find close matches between verbal descriptions and film content. By selecting, say, the best ten of these, we should find a clear pattern of good matches favouring those taken from real-time target recordings rather than the decoys. While this method, in its present form does not give specific weights to individual real time matches in each protocol, it is a start.

If we leave this aside for the moment and regard psi in these studies as a working hypothesis, which I think the above quantitative data entitles us now to do, then I believe we have the opportunity of actually learning something new about psi from the extant material. If we look at how psi mediated information enters consciousness, it becomes apparent that misperceptions occur like in those normal perception. One of our best examples is when a participant describes jumping white correctly even to the lemurs but as jumping white lambs.

Preliminary findings suggest a hypothesis that psi shows the same form of top down processes as occur in normal perception during non-optimal conditions:

- Sometimes entirely accurate perceptions occur
- Sometimes misperceptions occur
- Expectancy and memory associations play a determining role
- Overall characteristics such as form and movement are identified first and details filled in later.

The real time recording of hits will enable us to look further at this hypothesis. In particular we will be interested in looking for specific parapsychological markers in the data in the form of top down or other processes. If psi is mediated by top down processes, then we should be able improve facilitate psi by using film material selected specifically to facilitate top down processes (although I will keep quite for the moment about the exact content of this material). When we have come so far we can also begin to apply psychophysiological recording in order to illuminate how psi relates to brain processes.

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Anomalous Psychophysiological Responses to Remote Cognition: The DMILS Studies

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Abstract: Direct Mental Interactions with Living Systems (refers to a group of experiments that produced relatively consistent, positive effects in over 50 replications studies. In DMILS research an individual (an agent) attempts by means of cognition (mental interactions) to interact with a behavioural or psychophysiological response of another, sensorially isolated, living system (e.g., an individual, referred to as a receiver) under double blind conditions. DMILS research has largely focused upon the responses of the receiver's electrodermal activity (EDA) to a randomised schedule of calming or activating mental interactions of the agent. The findings from DMILS studies will be summarised, with specific focus on recent process-oriented research. The implications of DMILS findings and future directions of DMILS research will be discussed.

This presentation presents an overview of a group of studies exploring the ability of an individual to interact with the physiological processes of another, sensorially isolated, organism/person. Of course, there are many ways we can physically interact with each other, using our senses, that can produce behavioural and/or physiological responses. For example, if a person becomes aware that someone is staring at them, the psychophysiology of the person being stared at would probably respond to this 'sensory input' by showing signs of arousal. But could an individual respond if someone was directing attention towards them when the 'starer' was in another room (e.g., staring at them via a closed-circuit camera/monitor system), and there was no possibility of sensory communication occurring between the two rooms? Similarly, could the mere thoughts of one person bring about changes in the behaviour or psychophysiological responses of another, sensorially isolated, organism? The findings from the research that will be presented herein suggests that two organisms may have the ability to interact with each other, by means other than those involving currently understood sensory processes.

This work is usually referred to as "*direct mental interactions with living systems*" research and is commonly abbreviated to DMILS. The basic DMILS procedure represents a refinement and further development, of the work carried out by Prof. William Braud and his colleagues, and of earlier parapsychological psychophysiological research (see Beloff, 1974, and Morris, 1977, for reviews of the earlier psychophysiological work; see Braud & Schlitz, 1991, for a review of Braud et al's. DMILS research).

DMILS studies typically involve two participants, an 'agent' and a 'receiver'. The goal of the agent is to attempt to systematically interact with a behavioural or psychophysiological response of a living target system. The living target system, frequently another individual, may be referred to as a receiver as their objective is to

'receive' input from the agent and respond appropriately. In DMILS studies the agent and receiver are sensorially isolated from each other in order to preclude any currently understood means of sensory communication occurring between them. Instead the agent is to attempt to interact with the living target system by means of mental volition and intention. Thus in DMILS research, 'direct' refers to the effect not being mediated by conventional sensory or physical means; 'mental' refers to the involvement of volition, intention and imagery on the part of the agent to bring about the effect; 'interactions' refers to an apparent interaction between the agent and target system such that the target system appears to conform to the agent's intentions; and 'living systems' refers to the target being a living, biological organism.

The typical DMILS session involves multiple 'agent sending' periods during which the agent attempts to systematically interact with the sensorially isolated living system, using differing interaction goals. The most frequently studied response system in DMILS studies has been the electrodermal activity (EDA) of the receiver, and this is the psychophysiological response system that will be focused upon in this presentation (EDA is a basic measure of arousal). In an EDA DMILS session, the agent's goal is to attempt to either calm or activate the sensorially isolated receiver's EDA at differing times during the experimental session. A usual EDA DMILS session may last 20 minutes with this period being divided into 40 periods, each of 30 seconds duration. These 40 periods would be comprised of ten 'activate' periods and ten 'calm' periods, with the 20 'rest' periods interspersed between the activate and calm interaction periods. The ordering of the calm and activate periods are pseudo-randomly counterbalanced to protect against various time-dependent artefacts. Importantly, the receiver is blind to the ordering of the agent's sending periods, and thus is unaware what interaction instruction (i.e., calm, activate or rest) the agent is attempting to convey at given time during the session. A computer monitor conveys to the agent the sending (interaction) instructions for each 30-second period. The agent is aware that each interaction period will be followed by a 'rest' period during which no interaction with the receiver should be attempted. However, they do not know whether the sending period will be followed by a calm or an activate period until the instructions actually appear on the monitor. In many EDA DMILS studies, the agent is provided with an ongoing tracing of the receiver's EDA to enable them to assess the success of their attempts to calm and activate the receiver. Thus, during activate interaction periods the agent is hoping the receiver's EDA trace will show a great deal of activity, reflecting high arousal, and during calm interaction periods the agent goal is to have the receiver's EDA trace show relatively little activity or arousal. Given that the interaction periods (i.e., calm or activate) are pseudo-randomly counterbalanced and the receiver is unaware of the agent's interaction schedule, under the null hypothesis there should be no significant difference between the amount of EDA arousal displayed by the receiver during the calm or activate periods.

Conventional statistical tests are used to determine if any statistically significant difference between the receiver's responses to the agent's calm and activate intentions occurred. DMILS data is usually analysed using very conservative methods, where all the data from a session is collapsed into a single session score and these session scores are used as the units of analysis. The most commonly used method, employed by

Braud and his colleagues in most of their DMILS work, is a ratio method commonly referred to as a 'percentage influence score' or PIS (Braud & Schlitz, 1991). This analysis is based on the premise that in the absence of any psi effect, if the receiver's EDA is measured over a continuous period, with that period being *randomly* divided into equally sized, independent groups of sub-periods, there should be no significant mean EDA amplitude differences between the two groups of sub-periods. Thus under the null hypothesis, the mean chance expectation would be that the activity from any half of the randomly chosen sub-periods should be 50% of the activity from the whole. Using this percentage scoring approach, differences in absolute level of EDA between individuals is controlled for as one is looking at relative (percentage-change) differences between the calm and activated periods, as opposed to absolute differences. To calculate a PIS score for each session, the sum of the mean activate EDA for each activate period is divided by the sum of the total mean activate and calm EDA for each period. To obtain a study outcome, the percentage scores (PIS measures) from all the session are compared to chance expectation using a single-sample t-test ($MCE = 50.00$). Another method that has been frequently used in DMILS studies involves using a nonparametric Wilcoxon Matched-Pairs Ranked Sign test. Using this method, adjacent activate and calm periods are matched to form the 'pairs', and the Wilcoxon test is used to compute an outcome for each session. To obtain an overall study outcome, the session outcomes (Wilcoxon z-scores) can again be analysed by a single-sample t-test, where $MCE = 0$. To best judge overall replication rate across a group of studies, an effect size measure is commonly computed and reported for all DMILS studies (Utts, 1991). As much of the following paper will involve summarising the findings from groups of studies, effect size measures will frequently be reported.

Having considered the mechanics of a typical DMILS session, let us now turn to some of the psychological considerations. Namely, what are the receiver and agent told they should do during the session to help the DMILS effect occur? Usually the receiver is given instructions to keep their mind in an open, flexible state, and to avoid becoming too involved with any one train of thought. Thus they should try to maintain a mental state where their thoughts are unstructured, labile and can free associate. They should avoid trying to second-guess what the agent is trying to do at any given moment. Nor should they try to monitor their own physiology to see if they can detect whether they are feeling a bit more aroused or calmed. Instead they should simply make a gentle wish to themselves before the start of the experimental session that their body will respond according to the agent's intentions and then during the session they should trust that their EDA is responding appropriately. Similarly, while the receiver should remain receptive and open to interactions with the agent, they should not concentrate or focus on this objective. The task is presented as a joint-effort task, involving equally the co-operation of both the agent and the receiver.

Agents are usually told about three main interaction strategies that they can use, separately or in combination with each other. Firstly the agent can try to self-regulate their own physiology in accordance with their interaction schedule, in the hopes that their physical state will be reflected by the target system. Thus agents could attempt to arouse themselves during activate periods and during calm periods they could try to

relax so that their EDA showed little arousal. Another approach is for the agent to image, visualise and imagine the receiver in a situation that would be either very activating or very calming for them. Often before the session starts the receiver will be asked to share with the agent situations that would be very activating to them and others that would be very calming. As the agents frequently can see the receiver's ongoing, real-time EDA tracing, a third strategy is to try to 'will' the tracing to show a lot of activity during activate periods and to be relatively flat during calm periods. Also, the agent can use the receiver's EDA tracing to provide feedback as to how successful their various interaction strategies have been, allowing them focus on the more successful strategies as the session progresses.

This basic DMILS design controls for large number of potential errors. To list some of these briefly (for more detail, see Braud & Schlitz, 1991), the possibility of sensory cues occurring between the agent and receiver, or the receiver reacting to some artefactual external stimuli, is controlled for by keeping the two participants sensorially isolated from each other. This is usually accomplished either by locating them at some distance from each other and/or by having one or both participants housed in an acoustically and electromagnetically shielded environment. Recording errors are guarded against by using automatic recording methods, i.e., computer-controlled recording of session data. Additionally, much of the running of a session (e.g., randomising of calm and activate periods, presentation of receiver's EDA tracings to agent, etc.) is usually done via computer, thereby minimising the possibility that human error could affect the session outcome. Various forms of systematic error, such as habituation, electrode polarisation, fatigue, etc., are controlled for by the pseudo-random, counterbalanced ordering of the calm and activate periods. Similarly, expectancy effects on the part of the receiver are controlled for by the receiver being unaware of the randomised, counterbalanced ordering of the agent's interaction schedule. Chance correspondences are controlled for by every session having numerous calm and activate periods. The sample size of these studies is predetermined and all sound data is reported, eliminating the possibility of data selection. The possibility of participant cheating is controlled for by the sensory isolation precautions and by using many different participants in each study such that the outcome for any given session (or pair of participants) could not have a particularly strong impact on the overall study outcome. Also, in many studies the experimenter has served as the agent, thereby adding in another control against illicit communication occurring between the receiver and agent. Finally, the possibility of experimenter cheating is controlled for by multiple experimenter designs, having different studies conducted by different experimenters and having studies conducted at different laboratories.

As to the effectiveness of the above precautions, the sceptical community has not questioned the soundness of these studies. Indeed one sceptic, who has criticised other areas of parapsychological work, has co-conducted EDA 'remote staring' DMILS experiments that obtained significant outcomes (Wiseman & Schlitz, 1997; Wiseman & Schlitz, 1999). In this context it should perhaps be emphasised that the 'unseen gaze' work being popularised by Rupert Sheldrake (e.g., Sheldrake, 1994 & 1998), refers not to the DMILS 'remote staring' studies, but rather to comparatively

informally conducted 'experiments' using an approach that typically does not shield against various subtle means of sensory cueing. In contrast, the EDA 'remote staring' DMILS studies (e.g., Braud, Shafer & Andrews, 1993a & 1993b) are very similar in design to the 'calm/activate' EDA DMILS study described above, except the 'activate' period consists of the agent staring intently at the real-time image (shown on a monitor screen) of the receiver which is conveyed to the agent via a closed-circuit video camera system. Similarly the 'calm' periods become 'non-staring' periods where the agent does not view the image of the receiver. As in the 'calm/activate' studies, the receiver is unaware of when the remotely located agent is staring at their image.

While working at the Mind Science Foundation in San Antonio, Texas, William Braud and his colleagues, in the process of conducting a series of 37 DMILS studies from the late 1970's to the early 1990's, refined the above basic protocol. In these 37 experiments Braud and his colleagues explored seven different living systems, including two psychophysiological measures (EDA and blood pressure), various human and animal behavioural responses, and the haemolysis rate of in vitro red blood cells when osmotically stressed (see Braud & Schlitz, 1991, for a review of this work). In assessing the overall outcome of these 37 studies, Braud and Schlitz (1991) reported a combined Stouffer $z = 7.72$ ($p = 2.58 \times 10^{-14}$, one-tailed). The mean study effect size was .33 and 57% of the studies were independently significant, whereas only 5% would be expected to significant by chance alone. While all these results did come from the same lab, it should be noted that they involved a total of 655 sessions, 449 living 'receiver' systems, 153 different agents and 13 different experimenters.

Of these 37 studies, 19 involved an EDA response system. Fifteen of these studies followed the 'calm/activate' EDA experimental protocol. Six of these 15 studies, or 40% of those conducted, obtained independently significant results, whereas mean chance expectations (MCE) would have predicted only 5% would obtain significant outcomes. The combined Stouffer z for the 15 'calm/activate' studies was 4.08, demonstrating a highly significant effect ($p = 0.00002$), with a mean study effect size of .25. Similarly, four EDA 'remote staring' DMILS studies were reported, with all four showing a significant effect. A 'sham control' staring study was conducted that was analysed in the same manner as the other studies, however no staring actually occurred during any of the sessions. In this control study, no significant difference was observed between the 'staring' and 'non-staring' periods.

Since this initial work was carried out, replications have been attempted at six different labs, in the United States and in Europe. All the replication attempts have focused upon the EDA response system, using either the calm/activate or the remote staring protocol. The most recent review of this literature (Schlitz and Braud, 1997) found 19 calm/activate and 11 remote staring EDA DMILS studies had been conducted. Seven or 37% of the 19 calm/activate studies (involving 398 sessions) had achieved independently significant outcomes (where MCE = 5%), with the combined study Stouffer $z = 4.82$ ($p = 7 \times 10^{-7}$), and a mean study effect size of 0.25. Of the 11 remote staring studies (session number = 230), seven or 67% (MCE = 5%) obtained an independently significant outcome, with the Stouffer $z = 3.87$ ($p = 5 \times 10^{-5}$), and a mean study effect size of 0.25. If all the EDA DMILS studies are combined (i.e., both the calm/activate and remote staring studies), 47% or 14 of the 30 studies obtained an

independently significant outcome (MCE = 5%). The combined Stouffer z of the 30 studies is 6.17, which has an associated probability of 4.58×10^{-10} , with the mean study effect size remaining at 0.25.

These studies have achieved a relatively impressive track record. Braud and his colleagues have considered a variety of possibilities regarding why this body of research has been so successful (for more detailed information see: Braud, 1981; Braud & Schlitz, 1989; and Braud & Schlitz, 1991). They proposed that autonomic responses might be subjected to less cognitive interference than other types of psi responses such as those in which the receiver makes a conscious response about the target identity, for example by a drawing or verbally describing a mental impression, or guessing at which symbol a distant agent is looking. Braud and his colleagues have hypothesized that by looking at an unconscious, autonomic response, such as EDA, we may be avoiding a potential noise source by circumventing the cognitive processing system. Also, living targets may be seen as having greater lability than other, non-living target systems. Here lability refers to the target systems intrinsic variability or its ability to change, and thus its ability to respond to external influences. The hypothesis states that the systems with greater lability offer more 'windows of opportunity' in which the relatively small psi 'signal' may interact with the target system in a detectable manner (Braud, 1981). Another possibility is that living organisms may provide a more motivating and interesting target systems for agents to work with, or perhaps there is some intrinsic quality to living systems that makes them more mutually responsive. Also, in DMILS studies there are several potential psi sources that might contribute to any apparent psi effects. For example, there could be extrasensory perception (ESP) occurring between the agent and receiver, providing the receiver with information regarding the agent's intentions at any given moment, thereby allowing the receiver to unconsciously self-regulate to produce the desired effect. Alternatively, or in addition, DMILS effects could represent an agent exerting psychokinesis (PK) upon the target system, thereby influencing it to correspond with their intentions. The possibility of multiple psi sources means that the DMILS task can be presented to match the expectations and belief systems of the participants. For example, if a receiver and agent believe they have shared apparent ESP experiences in the past, the task can be represented as in terms of ESP occurring between the receiver and agent. If the participants are interested in potential medical application of DMILS effects, the task can be presented as analogous to mental healing effects. This feature of DMILS work may help ensure that the experimental participants are truly engaged in the task and motivated to succeed. Also, some DMILS tasks, such as remote staring, are already very familiar to participants and thus these tasks are not perceived by participants as being 'out of the ordinary' or unusual.

The DMILS studies that will be presented in more detail have been primarily directed at exploring two of the possibilities put forth by Braud and his colleagues, as outlined immediately above. The first concerned the speculation that in bypassing the cognitive processes, one avoided a 'noise' source that could potentially obscure the relatively weak psi signal. Surprisingly few previous studies have directly addressed this question (i.e., Tart, 1963, Targ & Puthoff, 1974, and Dean, 1974). Of these three studies, two produced outcomes that favoured the superiority of the physiological

response over the conscious response (Tart, 1963, and Targ & Puthoff, 1974). Thus a DMILS study was designed to explore whether conscious (verbal) responses or unconscious, autonomic responses (EDA) would elicit a larger ESP effect (Delanoy & Sah, 1994).

This experiment was conducted according to the basic DMILS design presented earlier, except that each session consisted of 16 calming and 16 activating periods, each of 30 seconds duration, and interspersed by 30-second long rest periods. There were 32 sessions in the study and in all sessions the receiver and agent were good friends. A notable difference between this and other EDA DMILS studies is that for half of each session the receiver was asked to guess what they thought the agent was trying to convey to them (i.e., was the agent trying to activate or calm them). The receiver was prompted to make their guess during the rest period that followed each interaction period. Also, receivers were asked to rate how certain they were that their guess was accurate. Similarly, the agents rated how successfully they thought they had 'sent' their intentions to the receivers, with these ratings being made during the rest periods. The receiver's EDA was measured throughout the session, and whether the conscious guess was made in the first or second half of the session was counterbalanced across sessions. The results obtained a significant effect in the expected direction using the receiver's EDA as the psi response measure ($df = 31$, $t = 1.77$, $p = 0.043$, one-tailed, effect size = 0.31). However the conscious guess measure did not differ meaningfully from chance expectations (exact binomial $z = 0.40$, effect size = 0.07). Nor were any significant effects obtained from any of the analyses involving the rating data. These findings support the earlier results of Tart (1963) and Targ & Puthoff (1974) and indicate that although the receiver had no conscious awareness of the distant agent's intentions, their unconscious, autonomic responses did reflect the agent's aims to a significant degree. Thus these findings offer further support for the idea that the unconscious, autonomic responses measured in EDA DMILS tasks may provide a more sensitive vehicle for detecting psi effects than tasks where the receiver must engage in overt cognitive processing to provide a response to the target.

Braud and Schlitz (1991) also noted the possible advantages of using a testing methodology that may involve multiple psi sources. This discussion raises issues of some importance, such as the relevance of the orientation of the participants to the task, and a closely related question about the role played by the various experimental participants in creating DMILS effects. For example, do the agent and receiver contribute equally to producing significant DMILS outcomes and/or could the outcome of any given experiment be dependent upon another of the study participants, namely the experimenter? In the context of parapsychological work, experimenter effects refers to the long noted observation that some experimenters seem to get positive psi results in most of their studies, whereas others rarely obtain a significant psi outcome. The phenomena of experimenter effects have been investigated in a variety of studies since the 1950's and currently there are three main classes of explanations for these effects (Palmer, 1986). One is that experimenter effects are in fact due to experimenter error, i.e., some experimenters get better results than others because they are less careful experimenters and errors occur in their work that favour

positive psi outcomes. Another interpretation of experimenter effects adopts a social psychology perspective. According to this hypothesis, some experimenters are better than others at motivating their participants to be successful and are more skilled at creating a comfortable, psi-conducive or psi-permissive environment for their participants (Schmeidler, 1997). Also, there is an experimenter psi hypothesis where the psi source in experimental studies is seen to come from the experimenter rather than the other session participants (e.g., the receiver and agent).

The potential importance of the role of the experimenter effects in DMILS studies has been highlighted by two studies conducted by a sceptic and a proponent of psi effects, Richard Wiseman and Marilyn Schlitz respectively, who have notably different track records in obtaining evidence for a psi-mediated staring detection ability. Wiseman (the sceptic) had conducted four remote staring DMILS studies (Wiseman & Smith, 1994, and Wiseman, Smith, Freedman, Wasserman & Hurst, 1995), none of which obtained a non-significant outcome (actually, one study obtained a significant outcome, but a post hoc examination of the randomisation procedure by the authors revealed an inadequacy that lead them to discount the study outcome). In contrast to Wiseman, Schlitz has a long record of obtaining significant outcomes in EDA DMILS studies (e.g., Braud and Schlitz, 1991, and, Schlitz and LaBerge, 1997). To further explore why their respective remote staring studies may have obtained such different outcomes, Wiseman and Schlitz co-conducted two EDA DMILS staring experiments (Wiseman and Schlitz, 1997, and Wiseman and Schlitz, 1999). Both studies used the same protocol, with Wiseman and Schlitz each serving as the experimenter, as well as the agent, in half the study sessions. Both studies generally conformed to the usual EDA DMILS design and used a closed-circuit video camera system to enable the agent to stare 'real-time' at the receiver. The first study was conducted at Wiseman's laboratory (University of Hertfordshire, England), using his equipment (Wiseman and Schlitz, 1997), and the second was conducted at Schlitz's lab at the Institute of Noetic Sciences in California (Wiseman and Schlitz, 1999). In both studies, when Wiseman acted as the experimenter, the participants produced non-significant outcomes (study one: Wilcoxon $z = -0.44$, $df = 15$, $p = 0.64$, two-tailed, effect size $r = .14$; study two: $n = 35$, Wilcoxon $z = -0.39$, $p = 0.69$, two-tailed, effect size $r = -.07$). In contrast, the participants that Schlitz worked with produced significant outcomes in both studies (study one: Wilcoxon $z = -2.02$, $df = 15$, $p = 0.04$, two-tailed, effect size $r = .50$; study two: $n = 35$, Wilcoxon $z = -1.93$, $p = 0.05$, two-tailed, effect size $r = -.33$).

In discussing the outcomes of these two studies the authors (Wiseman and Schlitz, 1997 and 1999) consider, and reject as unlikely, several different hypothesis that could account for their differing experimental outcomes. These hypotheses include, experimental artefact, undetected sensory leakage, participant cheating, experimenter fraud, and that by chance Schlitz ended-up working with more gifted psi receivers than did Wiseman. The two hypotheses that were not rejected involved: 1) Schlitz being more skilled in eliciting psi ability from receivers than Wiseman; and, 2) the experimenters may be the psi source in the study, with Schlitz having more psi ability than Wiseman. What gives rise to these apparent experimenter effects is not yet understood, but such experimenter effects need to be taken into consideration when

conducting process-oriented DMILS studies, and when evaluating replication rates across the database.

Other DMILS experimental findings have suggested that the psychological orientation of the participants towards the session and the session's participants may impact upon the findings, offering some support for the importance of social psychological factors. For example, a study was conducted in Freiburg, Germany to test a new interpersonal psi facility designed for the Institut für Grenzgebiete der Psychologie und Psychohygiene (IGPP), and to train interested IGPP staff to conduct EDA DMILS studies (Delanoy & Morris, 1998-99). During approximately the first half of this 32-session study, the six 'trainee' experimenters only worked with each other, taking turns to act as the experimenter, agent and receiver. It was thought this would provide them with a thorough understanding of a DMILS session from the perspective of all the participants. These initial eighteen sessions were considered to be 'training' sessions, although the 'trainees' knew they would count as 'real' sessions in the study. Then, being confident of their ability to act as an experimenter, for the second half of the study the 'trainees' served only as experimenters, working with participants who were not otherwise involved in the study, as would be the case in 'normal' DMILS sessions. The outcomes overall and from both the 'training' and the 'normal' DMILS sessions did not significantly differ from chance expectations. Nonetheless, it is interesting to note that those from the training sessions scored very slightly in the negative direction (Stouffer $z = -0.94$, effect size $r = -0.02$). While those from the 'normal' sessions approached significance and obtained an effect size that compares favourably with the mean EDA DMILS study effect size of 0.25 (Stouffer $z = 1.42$, effect size $r = 0.33$). Thus these findings may reflect a difference in attitude of the participants towards those sessions that they viewed as being purely training sessions and those which they regarded as 'real' or normal DMILS sessions, although this is a very tentative speculation given the lack of significant outcomes.

The importance of the receiver was highlighted in another DMILS study that examined the relationship between the receiver and the agent (Delanoy, Morris, Brady and Roe, 1999). This study was designed to follow-up on previous ESP experimental results using the ganzfeld technique that obtained significantly better scoring with biologically related sender-receiver pairs (e.g., parent-child, siblings, aunt/uncle-niece/nephew) than with those who were not biologically-related (Broughton & Alexander, 1997). In this DMILS study there were 40 agent-receiver pairs that were biologically related and 40 agent-receiver pairs that were friends, but not related. Also a variety of individual differences measures were administered to both the receiver and the agent, including a volitional competence questionnaire. This study failed to obtain any overall evidence of the psi activity traditionally associated with EDA DMILS studies, and it did not confirm previous findings suggesting the superiority of biologically related agent-receiver pairs. However, preliminary analyses of the individual differences measures has suggested that the receiver's personality traits were more consistently related to session outcome than those of the agent. For example, the volitional competence of the receiver related to session outcome, with receivers who rated themselves as having less volitional competence showing the greatest DMILS effects. These findings highlight the need for more research that

focuses on the role of the receiver in DMILS studies. It is planned to conduct a series of studies in the near future aimed at better understanding of the contributions made by the various participants (e.g., the receiver, agent and experimenter) in producing DMILS effects.

In closing, some key questions will be noted that are as of yet unanswered, but to which more work needs to be directed if we are to understand the meaning and the possible utility of DMILS findings. Many people view DMILS as potentially the most applicable of the different groups of parapsychological findings, for example this work has been presented as being analogous to healing work (Schlitz & Braud, 1997). As the preceding paper suggests, further work addressing some central questions should be conducted, before the applicability of DMILS work can seriously be considered. Some of these questions are:

1. ***What is the DMILS mechanism?*** Are we dealing agent PK, receiver ESP/self-regulation, experimenter effects or some combination thereof?
2. ***Can we improve our signal detection in DMILS studies?*** This question involves looking at different response systems, as well as working toward finding more sensitive analysis methods.
3. ***What are the key moderating variables in DMILS studies?*** This question encompasses the need to better understand the role of the various participants in producing DMILS effects (i.e., the role of the agent, receiver and experimenter); what contribution does each participant bring to a DMILS session? Also it includes identifying any individual differences that may relate to DMILS effects and specifying if different participant roles benefit from a different 'set' of individual differences.

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Towards The Physics of Psi: Correlation with Physical Variables

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Abstract: The evidence for psi has been mounting particularly with the proliferation of free-response methodologies such as ganzfeld, and the technique known as direct interaction with living systems or DMILS. We have identified two physical variables (i.e. the gradient of Shannon entropy and the geomagnetic field of fluctuations) and one orientation variable (i.e. the local sidereal time LST) that significantly correlate with the outcome measures of these methodologies. The trial effect-size is enhanced by a factor of three at 13.30 LST over the mean effect size at other values of LST. We will show the data in support of the correlations and speculate about possible mechanisms.

Before claiming that there are correlations of *psi* with physical variables, it is helpful to examine some of the evidence for an "information transfer anomaly." To do this properly, we provide definitions of the phenomenon, show a sample protocol for data collection and analysis, and give a brief overview of the collected evidence.

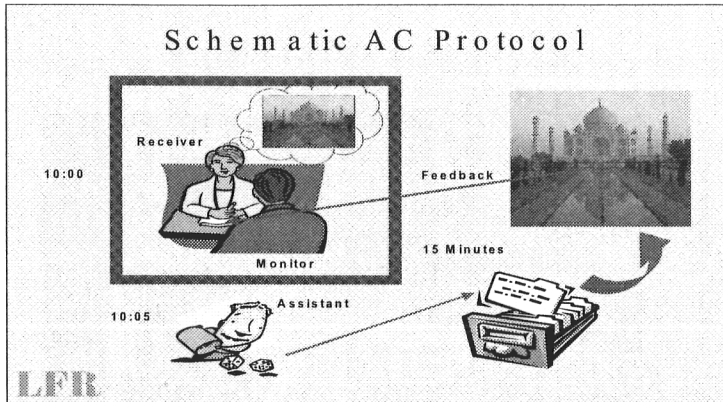
Using this as background, we then examine three physical correlates to psi:

1. The Gradient of Shannon Entropy
2. Local Sidereal Time
3. GeomagneticField Fluctuations Ap index

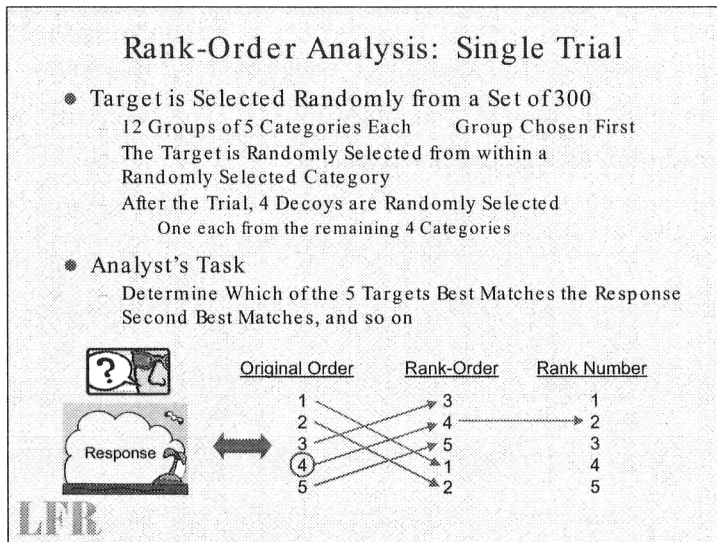
Finally, I will present a few speculations for the future.

Over the years, there have been many changes of terminology for the phenomena generally known as psi. We have added a new one in that we wanted to find a term that was as close to the observable data as possible, but did not have any implication as to possible mechanism. By definition, the classical terms such as ESP, telepathy, and clairvoyance all have mechanisms embedded in their constructs. Telepathy, for example, assumes there is a mind-to-mind communication, whereas what is generally meant is that telepathy *appears* to happen given a particular experimental setup. So we have chosen the term **anomalous cognition**: *The acquisition by mental means alone, of information that is blocked from the ordinary senses by shielding, distance, or time.* To experience cognition means to become aware of and anomalous means that awareness does not currently fit into the scientific structure.

A typical protocol for data collection goes as follows. Two people are sequestered in an isolated room. One we call a receiver (i.e., our word for experiment participant or subject) the other is an experimenter who we call a monitor. A third person (or a computer) randomly chooses one photographic image from a pre-defined collection to serve as the target for the session. At this point, although the receiver and the monitor might be knowledgeable of the total collection of photographs, they both are blind the specific one that was chosen.



Then for approximately 15 minutes the monitor interviews the receiver with regard to her impressions about the target. She writes and draws her impressions for later analysis. At the close of the session, the data are secured and the receiver and monitor are shown the target for feedback. This feedback does not constitute an analysis.



The current target pool consists of a total of 300 photographs organized into 12 groups consisting of 5 orthogonal categories each of which contain 5 similar photographs. A target is chosen by first randomly choosing a group, then a category, and finally a target. After the session, each of the four remaining categories in the selected group are accessed to randomly select one target from within each of them. The result is 5 photographs--4 decoys and 1 intended target--to be used by the analyst.

The analyst's task for a given response, is to select the photograph that best matches the response, second best matches the response, and so on until all 5 targets have been ranked according to their correspondence with the response. The statistical outcome for the trial is a single rank number corresponding to the place that the analyst put the intended target. In the example shown in the slide, the correct target was number 4. The analyst placed it second best, so the output rank is 2. On the average over many such trials, the null hypothesis is that the mean rank should be, in this case, 3.0.

Statistics for Rank Order

- Continuity-Corrected Effect Size:

Where

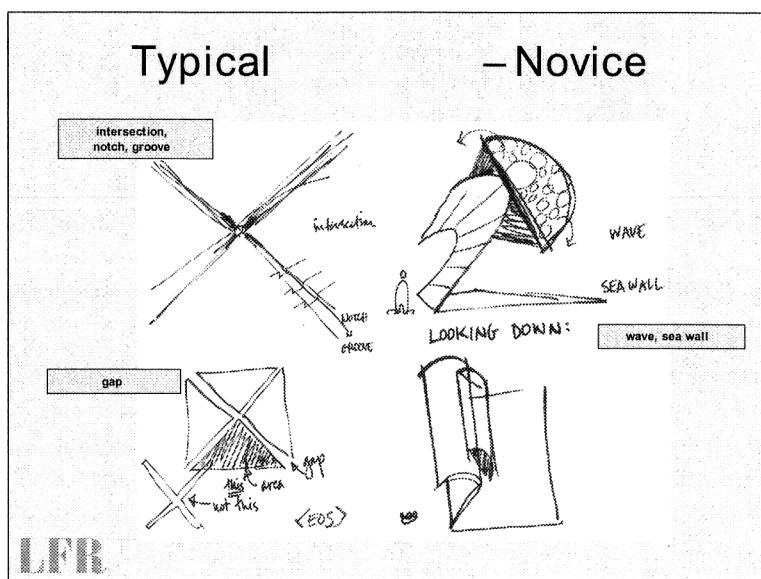
n = Number of Possible Ranks
 R_{ave} = Observed Average Rank
 M = Number of Trials

$$ES = \frac{\frac{n+1}{2} - R_{ave} \pm 0.5}{\sqrt{\frac{n^2 - 1}{12}}}$$

- After M Trials, Z-Score is Given by: $z = ES \times \sqrt{M}$

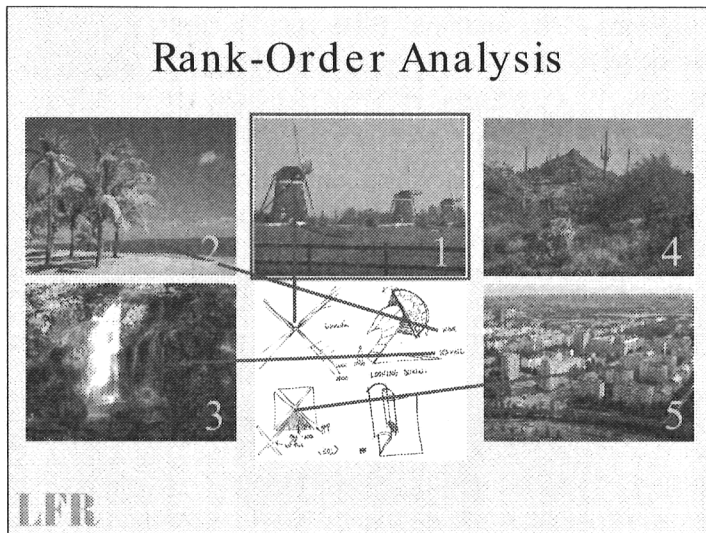
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This above formula shows the continuity-correct expression for the effect size computed over M trials and its associated z-score.



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This figure is the complete response for a novice participant. He said *intersection*, *notch*, *groove*, *wave*, *sea wall*, *gap*, and *looking down*. In addition, he drew a number of items. This response is typical of a novice participant.



The above picture displays the target pack for ranking, given the response. The arrows indicated that elements of the response can be found in different pictures--a situation that is typical in such analysis. The large numbers in each photograph show the analyst's opinion as to the ranking. In this case the correct answer is the windmill, so the rank number for this session is one. The previous example was just one drawn from a formal study of 24 trials that were conducted in an industrial setting in California. The overall effect size is rather large and the study was significant at $p = 0.0046$. One of the three participants produced an independently significant result in 8 trials for an effect size of 0.619.

Overall AC "Free Response" Results

- **Statistics**
 - Number of Trials ~2,500
 - Chance Hit Rate 0.25
 - Unselected S's Hit Rate 0.33 ± 0.03
 - P-Value 6×10^{-23}
 - Selected S's Hit Rate 0.60

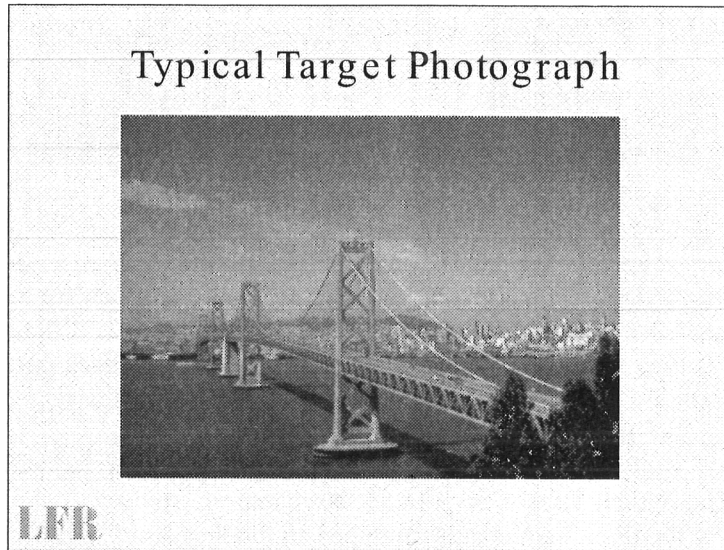
Utts (1991). *Statistical Science*. 6, No. 4. 363-403.
- **Publications**
 - *Proceedings of the IEEE* (1976)
 - *New Scientist* cover story (1993)
 - *Psychological Bulletin* (1994, 1999)

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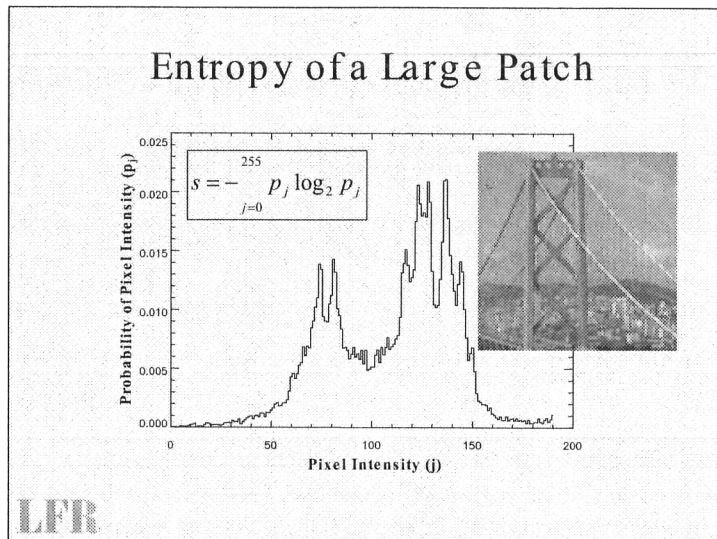
Professor (Statistics--University of California at Davis) Jessica Utts has published a meta-analysis of the "free response" database. After normalizing the data into a 1-in-4 choice analysis set, she finds overall that the hit rate is 0.33 where 0.25 is expected by chance. The approximate effect size is 0.22 leading to a p-value of 6×10^{-23} . The *Statistical Sciences* paper discusses a broad range of alternatives, which in

the end are rejected. Utts and the discussants in the paper agree that the null hypothesis must be rejected

We now move on to show correlations of anomalous cognition (AC) with various physical variables. The first of these is the gradient of **Shannon entropy**. The above list is a quick review of a few concepts about entropy. Thermodynamic entropy is a measure of disorder. The change, or gradient, of its information theoretic equivalent is related to information.

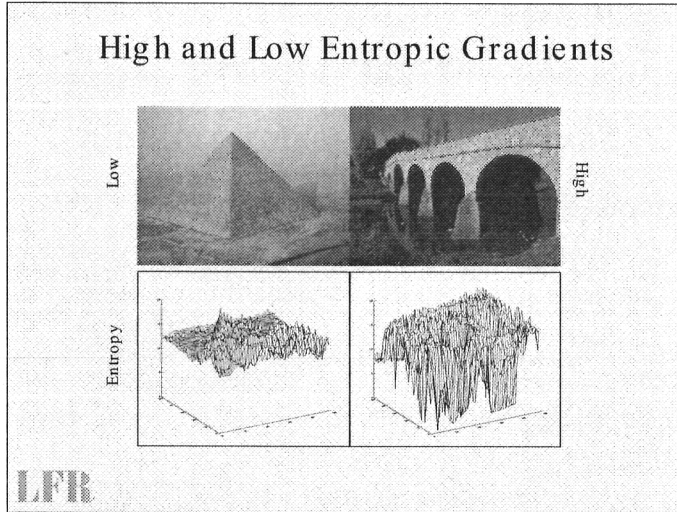


A typical target photograph--the Bay Bridge in San Francisco. This digital photograph contains 8-bits of color information for each of three primary colors, red, blue and green.

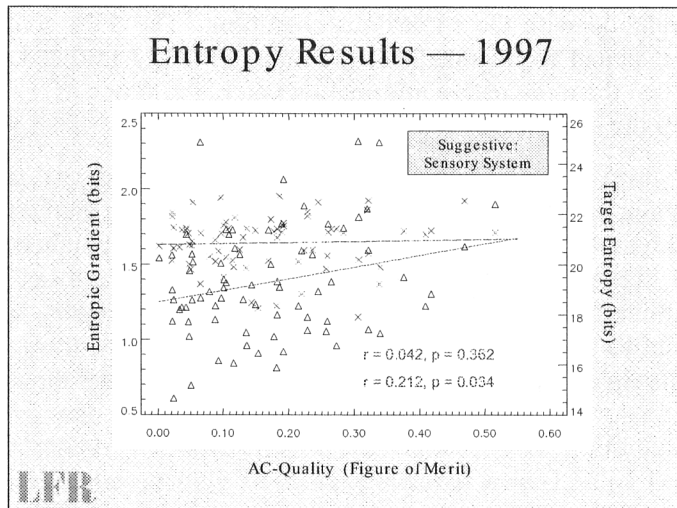


Consider a patch of the target photograph as shown in this figure. The actual patch is usually much smaller, but here it is large to demonstrate that it come from the

preceding photograph. For one of the colors, say green, each pixel may have a value from 0 to 255. For a given patch there is an associated pixel density shown in the graph. The density also is equivalent to the probability of finding a pixel with intensity “j.” The formula is a logarithmic average of the intensity distribution for this patch. The total entropy for this patch is the sum of the entropies for each of the three primary colors.

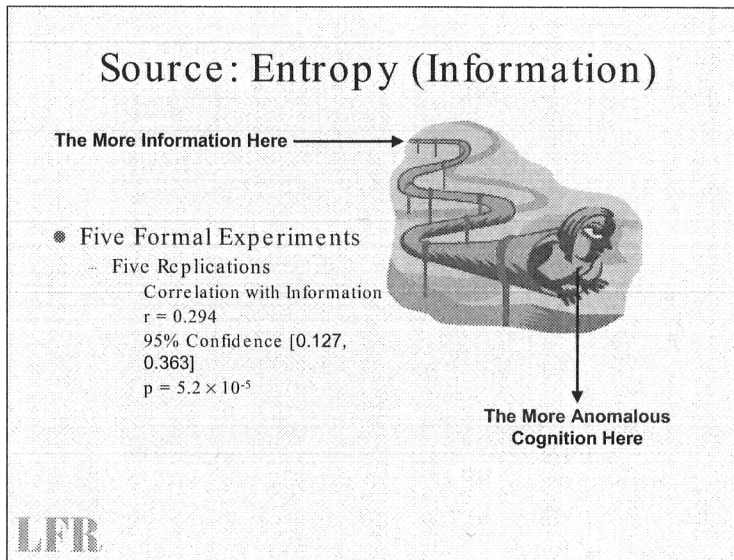


The plots are a representation of the entropy/per patch for each of the two photographs. They are plotted on the same vertical scale for easy comparison. We note that the pyramid is much “flatter” in entropy space than is the bridge. The dependent variable is the average gradient computed over the photograph. As it turns out, the bridge possesses about a 300% higher average gradient over that of the pyramid.



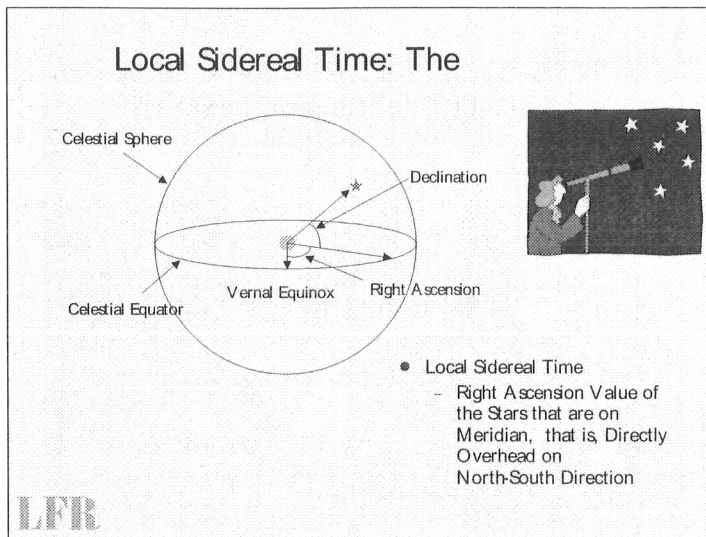
This scatter plot is typical of now 5 different experiments. Shown as black triangles are the points corresponding to 75 trials. The value on the left axis is the

gradient of Shannon entropy for the trial and the x-axis represents the quality of the anomalous cognition for the trial. The sloping line is the correlation of the entropic gradient with the AC quality. The 's represent the values for the entropy (rather than its gradient) which can be read on the right scale. There is virtually no correlation of anomalous cognition with the entropy of the target. Given that there is a correlation with the gradient and not with the entropy, these results are suggestive of a sensory system. All of the known senses are more sensitive to changes at their "front ends" than they are to the steady state.

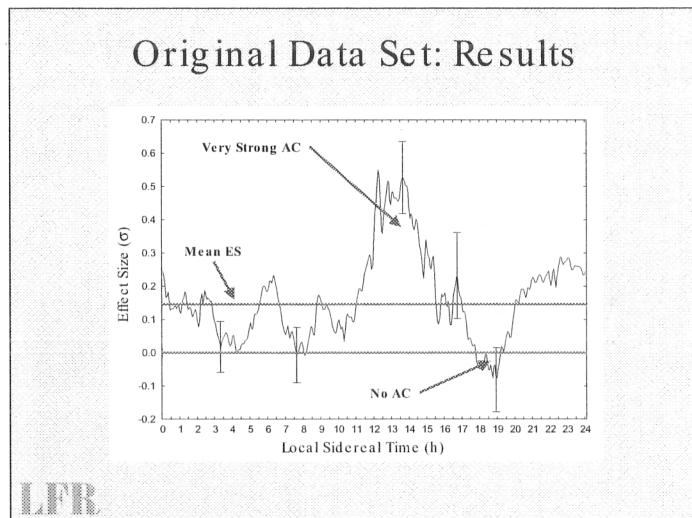


Perhaps anomalous cognition is either mediated through some combination of the known sensory systems or by an additional one as the name "extrasensory perception" suggests. All formal entropic gradient experiments to date have produced significant correlation with the anomalous cognition. The 95% confidence interval suggests that the actual correlation is in the range of 0.127 to 0.363. In words, these results suggest that the more native information you place in one of the *psi* channel the more *psi* you get out of it

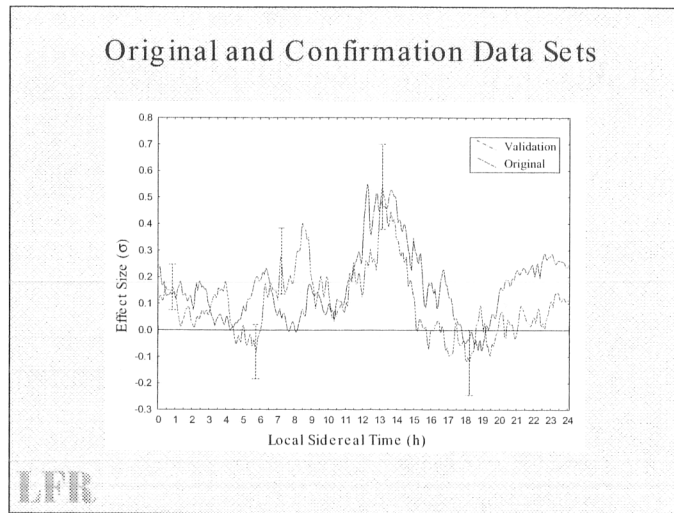
We now move to the second physical variable--**local sidereal time**. In general, it takes two angular numbers to locate a point on a sphere. On the Earth, for example, these are called longitude and latitude. Likewise it takes two numbers to locate a star in the celestial "sphere". These are called right ascension and declination. Right Ascension is similar to longitude and is measured in hours, minutes, and seconds, and declination is similar to latitude and is measured in degrees. The local sidereal time is, by definition, the right ascension value of the meridian arc that is directly overhead at each instant



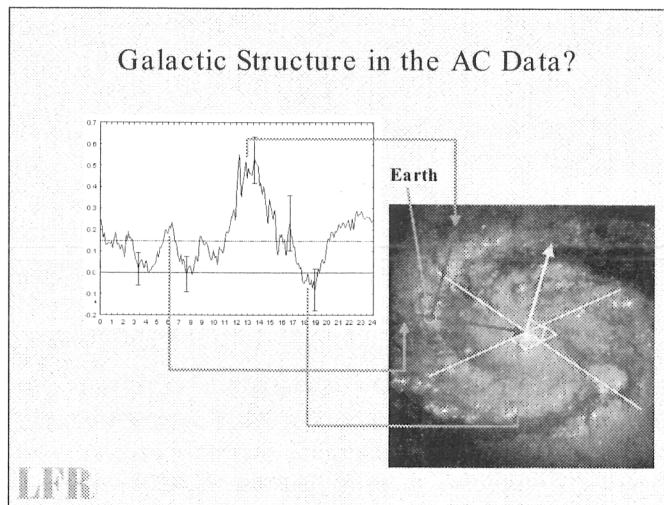
This value depends upon where one is on the surface of the earth and where the earth is in its orbit. If one were to conduct an experiment, say at 10:00 each day for year, that fixed clock time would sweep out 24 hours in local sidereal time.



This work is mainly due to James Spottiswoode. He examined approximately 1,500 free-response trials conducted over 20 years in many different laboratories by many different investigators working with many different participants. The curve shown in this slide is a sliding average of the effect size for each trial versus the local sidereal time at the onset of the trial. The mean effect size is approximately 0.15 and 0.0 represents the mean chance expectation. Two strong features stand out. There is a hole at approximately 18 h. local sidereal time (LST). That is over many hundreds of trials during this time there was no evidence of anomalous cognition. But at 13 h LST there is about a 300% improvement over the mean effect size. We spent many months examining potential artifacts but could not explain away this structure.

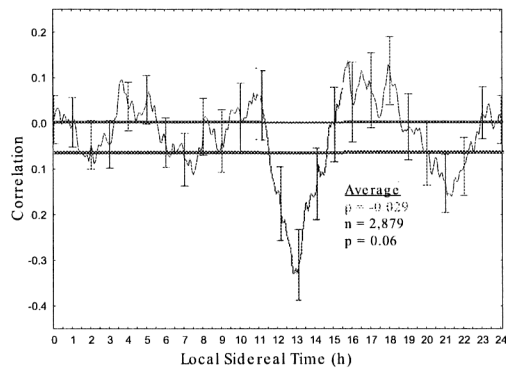


We asked our colleagues to provide us with additional data that were not in the original dataset as part of an independent retrospective test. The blue curve represents the first 1,500 trials which acts as a hypothesis. The red curve is the result of approximately 1,500 additional free response trials. The basic structure (i.e., peak near 13 h and hole near 18 h) was replicated.



One speculation is that some kind of radiation emanating from the Milkyway galaxy is either disrupting the brain of receivers or is, somehow, adding noise to a putative anomalous cognition channel. That is, when most of the Milkyway is hidden below the horizon, the AC is at a maximum, and the converse is true. When the galactic center is overhead, then AC vanishes. *We wish to emphasize at this time this correspondence is extremely speculative.*

Correlation to the Geomagnetic Field Index: Ap



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The third physical variable, is the correlation of anomalous cognition with the fluctuating **geomagnetic field** as described by the Ap index. The blue curve shows a sliding average of the correlation as a function of LST. Overall the correlation is quite small, but at 13 hours LST it is decreased by over a factor of 10. The green curve is a plot of the effect size as a function of LST to illustrate that when anomalous cognition is maximized so also the negative effect of a large geomagnetic fluctuation.

C o n c l u s i o n s

- Strong Evidence for an Information Transfer Anomaly
- Clues that it is Mediated via a Sensory-Like System
- Phenomenon may be Modulated by Subtle Environmental Factors

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In conclusion, there is incontrovertible evidence for a statistically based information transfer anomaly we call anomalous cognition. It appears to be mediated by some sensory system and is modulated by some subtle environmental factors.

Support for the Construct Validity of the Two-Factor Conceptualization of Paranormal Belief: A Complement to Thalbourne

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SIU School of Medicine

Abstract Paranormal beliefs have long been thought to be associated with issues of interpersonal and social control. Recent analysis of the Revised Paranormal Belief Scale using an advanced "top-down purification" procedure identified two distinct types of paranormal belief that may serve different control functions: "New Age Philosophy" (NAP) for interpersonal/ individual control and "Traditional Paranormal Beliefs" (TPB) for social control. Data from an earlier study by Thalbourne (1999) on 125 first-year psychology students allowed us to preliminarily test the construct validity of our NAP and TPB measures. We predicted that beliefs associated with NAP would show statistically significant higher positive correlations with transliminality, paranormal ability, general paranormal belief, direct paranormal experience, drug use, and the Kundalini Experience than those found with TPB. By contrast, we expected TPB to show higher (positive) correlations with fear of the paranormal and belief in Determinism. Analyses largely confirmed predictions and thus provide tentative support for the construct validity of our NAP and TPB measures, but we suggest that additional research is necessary using all "purified" measures in order to validate the results. We also identify other expected differences between NAP and TPB as topics for future studies on the psychology of paranormal belief.

Paranormal Belief and Issues of Control

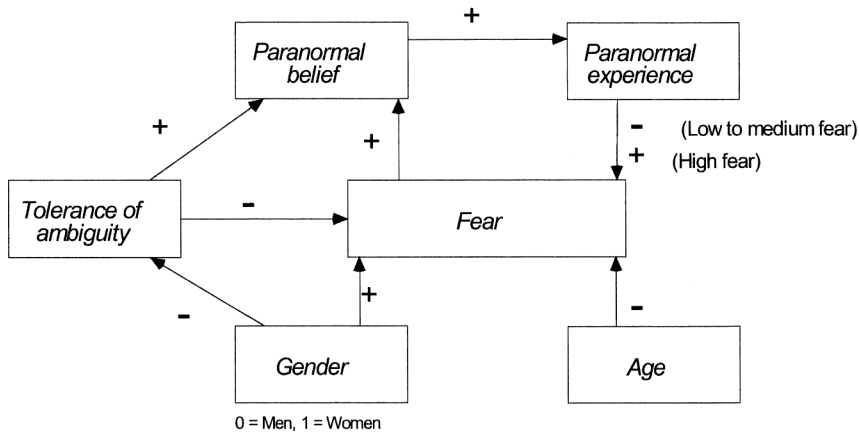
A belief or behavior serves a psychological function if it has useful consequences for the mental-well being of individuals. It may not be immediately apparent, but superstitions and paranormal beliefs resemble religious beliefs in that they satisfy intellectual, emotional, and social needs. Accordingly, paranormal beliefs allow people to account for and interpret natural and social phenomena and events. This was the basis of E. B. Tylor's (1871) theory of the origins of animism - that people sought explanations for things they saw in dreams and imaginings and then mistakenly came to believe in spiritual beings. However, anthropologists Peoples and Bailey (1988, pp. 322-333) noted that beliefs in supernatural phenomena do not take the place of practical and scientific knowledge, but in a curious way, they supplement it. It is not surprising therefore that paranormal beliefs and experiences are prevalent worldwide and can be found even in well-educated quarters of society (Haraldsson, 1985; Gallup & Newport, 1991; Ross & Joshi, 1992).

Irwin (1992, 1994, 1999, 2000a) maintains that paranormal beliefs are endorsed by some people because they provide a sense of control over life events - an "illusion of control" (Langer, 1975). That is, the notion of the paranormal empowers individuals with control, efficacy, and understanding over uncertain events.

Laboratory experiments have confirmed that paranormal believers are more inclined than nonbelievers to perceive meaning in ambiguity or random events (Blackmore & Troscianko, 1985; Brugger, Landis, & Regard, 1990; Blackmore, 1992; Blackmore & Moore, 1994) and more inclined to claim a relationship exists between these events to their own thoughts and actions (Brugger, Regard, & Landis, 1991; Brugger, Regard, Landis, Cook, Krebs, & Niederberger, 1993).

Paranormal belief is also associated with a *need* for control. Many everyday superstitions arise in situations of uncertainty whose outcomes are out of control by the waiting subject (e.g., Gmelch, 1972; Shrimali & Broota, 1987). Similarly, Tobacyk and Shrader (1991) recently found that superstitious belief (as measured by the Revised Paranormal Belief Scale discussed below) was negatively associated with general self-efficacy and social self-efficacy in women. Further, Irwin (1992) reported that paranormal believers tend to be perceived by independent judges as being very controlling in their behavior toward other people. In other words, paranormal belief is sometimes related to a need for interpersonal control. This theme continues to be emphasized in the psychological literature on paranormal belief (see e.g., Irwin, 1994, 2000a; Dag, 1999; Dudley, 1999).

Figure 1: Path diagram of Lange and Houran's defense model of paranormal belief.



For details, see Lange & Houran (1998, 1999)

Recently, two path analytic studies (Lange & Houran, 1998) validated the causal influence of tolerance of ambiguity (a person's need for explaining ambiguous information) in the construction and maintenance of paranormal beliefs. (For an overview, see Houran & Williams, 1998). *The Defense Model of Paranormal Belief* depicted in Figure 1 shows that paranormal beliefs reduce low or mild fears and anxieties associated with facing ambiguous stimuli, thereby creating a negative (i.e., self-correcting) feedback loop. It is interesting to point out that this strategy does not work when people are already highly fearful. In these instances, paranormal beliefs

and experiences instead increase fear of the paranormal, thus creating a positive (i.e., self-reinforcing) feedback loop (Lange & Houran, 1999). Taken together, these findings indicate that people face a basic choice between fear and belief, and this hypothesis is supported by advanced nonlinear analyses which use this juxtaposition as their dependent variable (Lange & Houran, 2000). For a summary of this research see Lange and Houran (2001).

Evidence for Two Distinct Types of Paranormal Belief

Tobacyk's (1988) Revised Paranormal Belief Scale (RPBS) is, as an amended version of the questionnaire developed by Tobacyk and Milford (1983), among the most widely used instruments to assess paranormal belief. Originally, the RPBS was believed to represent seven orthogonal types of beliefs, namely, *Traditional Religious Belief*, *Psi*, *Witchcraft*, *Superstition*, *Spiritualism*, *Extraordinary Life Forms*, and *Precognition*. However, Lawrence (1995) and Thalbourne (1995) argued that the RPBS' components are not orthogonal. This is actually a suggestion supported by Lawrence and De Cicco (1997) and Lawrence, Roe, and Williams (1997) who concluded that the RPBS has only five oblique factors, namely, *Traditional Religious Belief*, *Psychic Beliefs*, *Witchcraft*, *Superstition*, and *Anomalous Natural Phenomena*. To complicate matters, Tobacyk and Thomas (1997) have recently proposed that the RPBS is comprised of seven factors that mix both orthogonal and oblique interrelationships, while Hartman's (1999) method of minimum average partial and parallel analysis criteria uncovered only four factors. Indeed, by contrast Thalbourne, Dunbar, and Delin (1995) found only one single factor

Recently, we (Lange, Irwin, & Houran, 2000) showed that the debate summarized above is probably undecidable within the framework of standard factor analysis as the divergent findings may be artifacts related to: (1) the use of item-level factor analysis, a practice which has long been known to yield spurious results (Comrey, 1978); (2) the assumption that variables are adequately measured by raw scores or factor scores (Michell, 1990); and (3) the absence of testing to detect "differential item functioning" (item bias) due to scaling effects related to age and gender. To avoid such pitfalls, we used a "top-down purification" procedure involving Rasch scaling (see e.g., Wright & Stone, 1979), combined with tests for dimensionality (Nandakumar, 1991), and the removal of biased items (Shealy & Stout, 1993) in an iterative fashion. In other words, our top-down purification approach has the aim of creating reliable and unidimensional interval measures of paranormal belief that have a known fit to the Rasch model and clearly defined scaling properties. Subsets of the RPBS items were shown to have all of these desirable features and all but ten items proved eminently scaleable. Moreover, the scaleable subsets are free of any gender or age related biases that may cause "phantom factors" to appear in item-level factor analysis (see Lange et al., 2000, Appendix A). Thus, much of the debate concerning the factor structure of the RPBS evaporates when Rasch scaling is used to uncover the sample independent properties of the RPBS items.

Our analyses identified two clusters of items. The first cluster, comprising items 2, 3, 5, 7, 9, 12, 14, 16, 19, 21, and 23, was interpreted as representing "*New Age Philosophy*" (NAP; e.g., psi, reincarnation, astrology). These beliefs seem to instill a sense of control over external events on an *individual* level (Irwin, 1992; Lawrence,

Edwards, Barraclough, Church, & Hetherington, 1995) and may be reinforced by personal experience. It may seem contradictory that astrology (the premise that astronomical configurations influence human behavior and external events) provides empowerment to individuals since astronomical phenomena cannot be directly controlled by people. However, we suggest that astrology might be regarded by contemporary believers as a divination tool to be exploited - providing previously "unobtainable" information that, once known, can now be used to the believer's advantage. The second cluster (items 8, 17, 22, 24, and 26) was interpreted as reflecting "**Traditional Paranormal Beliefs**" (TPB; e.g., the devil, Heaven and Hell, witchcraft), which are effective in maintaining control over external events on a *social* level and which are largely reinforced by the individual's culture (see e.g., Ember & Ember, 1988; Peoples & Bailey, 1988). In other words, while some have argued that the RPBS may need to address additional types of beliefs (see e.g., Lawrence, 1995; Lawrence & De Cicco, 1997; Lawrence et al., 1997), most of its items are in practice quite satisfactory. Moreover, because the original RPBS factors disappear when biased items are removed, we speculate that individuals actually categorize their paranormal beliefs and experiences in a much simpler fashion than is implied by the five vs. seven factor debate. In fact, it is possible that any new items, not currently contained in the RPBS, may be subsumed by one of our two clusters.

It is important to note that, as opposed to the previous research which only considered the *contents* of the belief items, our clusters emphasize the different *functions* of paranormal beliefs. Since our functional distinction and new Rasch scoring scheme provides a new perspective on the RPBS, it is important to establish its construct validity. One way to begin doing this is to see if the two clusters differ predictably in their relationship to variables with individual versus social components.

We became aware of Thalbourne's (2001) study while it was in progress and his gracious permission to use his data set allowed us to test some of these predictions.

Hypotheses and Results

Recall that Thalbourne (2001) administered to 125 first-year psychology students the Australian Sheep-Goat Scale, Tobacyk's Revised Paranormal Belief Scale, the Anomalous Experience Inventory (which includes items on anomalous experience, belief, ability, fear of the anomalous, and drug use), the 29-item Transliminality Scale, and measures of the Kundalini experience and Determinism/Free Will. Interval level Rasch NAP and TPB measures were obtained by scoring the RPBS items according to the conversion Tables given in Lange et al. (2000). The correlation between these two measures was 0.47 ($p < .001$), which is not significantly different from the value 0.57 obtained in the earlier study ($z = 1.35, p > .06$).

We hypothesized that beliefs related to "New Age Philosophy (NAP)" should correlate with other beliefs and experiences that reflect individualism, a sense of self-control/ self-efficacy, and these beliefs would be caused or reinforced by personal experiences (either pathological or "idiophanous" in nature). On the other hand, if "Traditional Paranormal Beliefs (TPB)" are largely social constructions that emphasize humankind's place in an uncontrollable realm, then they would be expected to be less associated with personal experience and to relate more to a mechanistic view

of the world involving a basic fear of the paranormal (i.e., a fear of the forces that control one's daily life). This idea follows from Tobayk, Nagot, and Miller (1988) who proposed and found evidence that greater interpersonal control is negatively associated with belief in superstition and witchcraft. Thus, NAP should show *higher* positive correlations than those found with the TPB with measures of transliminality, paranormal ability, paranormal belief, paranormal experience, drug use (because this variable may signify an openness to experience or because drug use can elicit anomalous experiences in need of an interpretation), and the Kundalini Experience. By contrast, TPB is expected to show higher (positive) correlations with fear of the paranormal and Determinism.

Table 1. Correlations between the New Age Philosophy (NAP) and Traditional Paranormal Belief (TPB) clusters of the RPBS and other personality variables from Thalbourne (1999) ($N = 135$).

	RPBS cluster	
	<i>NAP</i>	<i>TPB</i>
Age	.19*	.07
Gender	.11	.03
ASGS ^a ***	.77***	.46***
AEI Experience***	.61***	.34***
AEI Belief***	.76***	.38***
AEI Ability***	.62***	.38***
AEI Fear*	-.03	.17
AEI Drug Use***	.23**	-.12
Transliminality**	.64***	.45***
Rasch-Trans Scale	.47***	.37***
Kundalini***	.52***	.26**
Determinism	.02	.14

^a Australian Sheep-Goat Scale

^b These asterisks reflect the statistical significance of differences between the correlations in the two columns.

* $p < .05$ ** $p < .01$ *** $p < .001$

Although the NAP and TPB were found to be positively correlated, they clearly measure different constructs since they share only 22% of the variance. Moreover, their pattern of correlations with the non-RPBS variables is decidedly different. Table 1 gives the relevant correlation coefficients of the variables from Thalbourne's study with the NAP and TPB, together with the statistical tests of the resulting differences. It can be seen that most of our predictions are confirmed.

In particular, the correlation of the ASGS, the AEI Paranormal Experience, Paranormal Belief, Paranormal Ability, and Drug Use subscales, transliminality, and Kundalini all correlate significantly (all $p < .01$) higher with NAP than TPB. Conversely, TPB shows a significantly higher (positive) correlation with the fear subscale of the AEI. However, while Determinism shows a higher correlation with TPB than with NAP, this difference fails to reach statistical significance ($t(122) = -1.30$, $p > .09$). The only statistically significant effect of gender or age was an association between age and NAP, but as this effect only constituted 4% of the

variance, we conclude that age has no practical influence on the perception or report of NAP. Thus, contrary to previous literature, our results provide additional support for the notion that there are virtually no direct associations between age or gender and paranormal beliefs and experiences (see Lange, Irwin, & Houran, 2001). Instead our process model in Figure 1 indicates the relationships among paranormal belief, gender, and age are mediated by an individual's tolerance of ambiguity and fear of the paranormal.

Discussion

Although the present findings are clearly consistent with our two factor Rasch formulation of paranormal belief, we note that the measures other than the RPBS used by Thalbourne (2001) were not tested for bias and thus the present results are probably distorted to some extent. Research (Lange, Thalbourne, Houran, & Storm, 2000) indicates however that correlations do not necessarily change much in magnitude or significance once other measures are purified as well. Yet, we cannot be sure that this will hold in the present context and further research is needed with purified measures. In addition, we expect correlational differences between NAP and TPB with variables other than those used here. For instance, we predict that higher NAP scores are characterized by greater internal locus of control, greater tendency towards dissociation, higher tolerance of ambiguity, more extroverted personality, and less religious traditional belief. By contrast higher TPB scores are predicted to be associated with greater external locus of control, lesser tendency towards dissociation, lower tolerance of ambiguity, more introverted personality, and more traditional religious belief. Since the preparation of this article, we have published studies that confirm some of these predictions (Houran, Thalbourne, & Ashe, 2000; Houran, Irwin, & Lange, 2001). In addition, research is underway to see whether or not the beliefs assessed by NAP and TPB play a different role in our Defense Model of Paranormal Belief in Figure 1.

We hope this report and our recent research on the RPBS (Lange et al., 2000) and Thalbourne (2001) inspires others to delve into this alternative approach to the psychology of belief in the paranormal. This approach categorizes and studies paranormal beliefs and experiences according to the *functions* they serve rather than the content they seemingly share. Also, to avoid spurious results due to differential item functioning and poor scaling, we strongly argue that only purified measures be used in future research. For this reason, the most widely accepted findings based on possibly biased instruments should be reexamined for artifacts (see e.g., Houran, 1999; Irwin, 2000b; Lange, Irwin & Houran, 2001; Lange, Thalbourne, Houran, & Storm, 2000).

Acknowledgments

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Learning from Historical Cases: Six Selected Poltergeist Cases from the 1700s in Germany

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Abstract Six unknown or relatively unknown poltergeist cases from the 18th century are presented. The main phenomenological features of these cases are described and found to correspond well with those belonging to modern poltergeist cases. The cases from the 18th century are of special interest because they occurred before the advent of household electricity (limiting the application of an electro-magnetic theory of poltergeist phenomena). A common feature of the early cases is the interpretation of the phenomena in terms of the strong religious belief system of the time contrasting with earlier interpretations, which had been made in the folklore tradition. This contrast is reviewed historically in order to show how in folklore the perception of the poltergeist has changed from that of a friendly spirit to become first an externally threatening agent, finally becoming a domestically threatening agent. This is a progression which is paralleled in the ways which many contemporary RSPK-cases develop. This historical perspective on poltergeists may help us to understand the role of that belief has in the form which poltergeist and haunting cases take.

"The person who catches a 'goblin, nymph, or another ghost' dead or alive in his house, in his cattle shed, in the becks or ponds, gets a reward of 5 gold pieces from the Master of the hunt." This quote is taken from the Proceedings of the Municipal Council for the City of Hechingen in Germany and is dated 8 February 1525 (Horst 1825, p. 380). Nearly two hundred fifty years later, the question "Can a rational man believe in ghosts and apparitions?" was still being asked, expressed in the form of a book title from 1764 (Parson C. L. Stuetzing). A diplomatic answer for that period can be found in a quotation from another book, *A Message of a Ghost*, published in 1750: "Although I have never been so absurd, as to deny that ghosts and apparitions may exist, I have thought of these as belonging to the rarest of events." (Fleischer 1750, p.p. 33-34).

Today, when several more hundred years have passed, we are still lacking a clear answer and consensus as to the nature of these experiences. It seems therefore appropriate to see what we can learn from the past by looking at the area in its larger historical perspective. Serious scientific research as we understand the concept today began in the area of ghost and poltergeists at the end of the 1600s and beginning of the 1700s. This article is the second in a series of reports (Puhle 1999, Puhle 2000a, Puhle 2000b) concerning the relevance of lesser known or in some cases previously unknown historical cases from this period for our conceptualisation of poltergeist phenomena.

It would seem that ghosts in the 1700s were not the unitary species we think of them as being today. For instance, goblins in the context of the German tradition were regarded as a type of ghost (Geist) and a subspecies of goblins were identified as poltergeists. Current science uses the term "poltergeist" for special strange occurrences, so-called "recurrent spontaneous psychokinesis" (RSPK). Catherine

Crow (1848) introduced the word poltergeist into the English language but in contrast to the German usage, the current Anglo-american terminology now distinguishes between “poltergeist” occurrences which are person orientated and “haunting” phenomena which are place orientated (Roll 1977b, p. 399). The six selected historical reports that follow are about poltergeists in the original meaning with no attempt being made to determine if the case is place or person bound or even something else. Fanny Moser (1950) introduced the term *ephemerer Spuk* (ephemeral spook) to describe a third type of case. The issue is evidently complex and is discussed more fully elsewhere (Puhle 2000a). The six cases should contribute towards clarifying what it is that colours our contemporary perception of - to use Rhea White's term - *poltergeist encounters* (White 1994, p. 150). None of these selected cases have been previously reported in detail in RSPK research. Two of them (Wegner, and Mayor of Ueblitz) have never been mentioned in contemporary reviews, and are not even to be found in the 500 hundred case collection of Gauld and Cornell (1979).

I will now outline these six cases which took place between 1714 and 1760, summarise the main events and present the most reported phenomena. These features will be compared in detail in a later report (Puhle 2000a) with those that characterise modern cases. Finally, I will say some words about the relevance of this historical research for current RSPK work.

Outlines of Six Selected Historical Poltergeist Cases

These are given in chronological order and since the cases are relatively unknown and not easily accessible the full title in German (which at this time is lengthy because it functions as a summary) is given along with the publisher. The basic facts of the cases are then summarised.

Case Nr. 1: from 1713.

Florian Bertram Gerstmann's exact and truthful presentation of the ghost and poltergeist which has done much strange damage in the town of Dortmund, in the house of Dr Barthold Florian Gerstmann"; footnotes and theological comments included, printed in Leipzig and Osnabrück, edited by Michael Andreas Fuhrmann, 1714. (160 pages, archived in München, Halle, Wolfenbüttel.)

(Florian Bertram Gerstmanns/ genaue und wahrhafftige/ Vorstellung/ Des Gespenstes/ Und/ Polter-Geistes/ Welches/ In der Kayserlichen/ und des Heil. Römischen Reichs/ Freyen Stadt Dortmund, und zwar in dessen Vatters/ D. Barthold Florian Gerstmanns Hause 4. Wochen weniger/ 3. Tage/ viele wunderseltzsame Auffzüge und Schaden verübet hat./ Nebst Anmerckungen und einem Theologischen Bedencken/ Zum Druck befördert./ Leipzig und Oßnabrück/ Verlegt von Michael Andreas Fuhrmann/ 1714.)

The case, which is described in more detail, elsewhere (Puhle, 1999, p.p. 298-300), was active from 5 May until 2 June, 1713 in Dortmund in the house of the well known physician Barthold F. Gerstmann. The report on the case, originally in Latin, was written by his son, Florian Bertram Gerstmann, and in the form of a 159-page diary giving precise details of events.

The members of the family who were primarily involved in the case, were Barthold Gerstmann, his wife, and his two sons. Barthold Gerstmann is described as a devout Lutheran, widely respected as a general practitioner. The two sons referred to, are the writer of the diary, Florian Bertram, still a student at the time, and a younger son whose age is not given although he is obviously old enough to give detailed reports and be accepted as a witness by his father and brother. A daughter is also mentioned as the first person to become aware of the incidents. There were however other non-family witnesses: Many of the later occurrences were witnessed by the family maid and amongst the many spectators to the events, is an important witness, the parson Brüggmann.

The phenomena primarily concerned stone-throwing, breaking windowpanes and went on for 20 days. In total 760 stones and 147 broken panes were documented. The bombardment started originally outside the house but afterwards continued even inside. Apparently all the stones came from the garden or the wall and were sometimes found to be mingled with clay and nails. On examination, they occasionally felt warm. The father described what was experienced as especially extraordinary about these incidents:

"We were not able to see the stones before they either broke through the window-pane and fell to the ground or landed in the garden, or even when they fell on the pavement in front of the house, but in all cases they could be gathered and identified. They hit nobody and were only thrown to damage something, destroying whatever object they hit" (Gerstmann 1714, p.109).

Case Nr. 2: from 1718.

The true report of the strange and wonderful effects of a so-called goblin, or/ an invisible creature in the parsonage of Gröben/ an attempt to test how the truth can be discovered? Testified by the parson of the place/ Jeremias Heinisch, Bernau. March/ Jena, published by Joh. Meyer's widow, 1723. (64 pages; archived in Wolfenbüttel, Weimar and München.)

This is published together with a supplementary report titled:

Lessons on how to test ghosts and ghost stories: guided by interrogations on the true report by Mr Jeremias Heinischen, parson of Gröben, on the effects of a so-called goblin in the parsonage itself. (80 pages, archived in Wolfenbüttel.)

(Das Zeugniß/ Der reinen Wahrheit/ von den/ Sonder und wunderbahren Würckungen eines insgemein sogenannten Kobolds, Oder/ Unsichtbaren Wesens/ in der Pfarr Wohnung zu Gröben, zur Prüfung übergebene Versuch/ wie weit/ in der Erkenntniß dieser Sache zu gelangen?/ auf inständiges Begehren/ abgestattet/ Von des Orts Predigern/ Jeremias Heinisch, Bernav. March./ Jena, Verlegts Joh. Meyers sel. Wittbe. 1723.)

From June 17 until September 8 in the year 1718, a classical poltergeist case took place in the home of the parson Jeremias Heinisch. The report, published five years afterwards, describes how the parsonage in the village of Gröben near Jena was bombarded during the day with stones without there being any apparent natural explanation. For instance, on July 31 in that year, Heinisch observed that "a stone from the earth flew up from the courtyard, reaching the top of the roof and then

landing with a great force." During the above period some of the witnesses testified as to how they had seen "the stones coming from a large garden of trees and from the angle of the garden door, and sometimes coming from out of the wall of the vicarage" (Heinisch 1723, p. 4).

The peace of night was being constantly broken for the inhabitants not only by the continued throwing of stones, and the breakage of pots and bowls, but even by acoustic phenomena such as sounds of scratching and clawing. In the end the disturbance became so great that the house had to partly vacated.

The household consisted of the parson and his wife, and some others who are not specified. A baby to the parson and his wife was born during this period, on August 5.

Apports where objects penetrated doors were also reported in this Gröben case. For instance on August 14, "a piece of lead... was often during the day removed from the weights of the clock, and either thrown at the door of my wife's room or into the hall in front of her room. It was thrown with quite a hefty force, and the door of the downstairs room was opened without anyone being there" (Heinisch 1723 p. 11). Heinisch goes on to report several other oddities which took place in Gröben and says at the end of his documentation: "It is my intention to relate to you only that which is most important (phenomena) and which I have myself either seen or heard and experienced with a sufficient degree of certainty" (Heinisch 1723, p. 19). It is of course remarkable to read these words written by a parson who previously had expressed his opinion in the foreword of his book quite openly about goblins and similar incidents as follows: "they are merely old wives' tales, the work of foolish imaginations, stupid superstition, or roguish deception" (Heinisch 1723, foreword). The conclusion he reaches is actually similar to the one reached by Brüggmann in the Dortmund case (case 1). Like Brüggmann, Heinisch discusses the different reasons for the poltergeist incidents and arrives at the conclusion: "the real author (of these events) is a ghost and an evil one at that" (Heinisch 1723, p. 40).

Case Nr 3: from 1722.

A curious and true message or diary about a Ghost and Poltergeist/which has shown his apish antics in such diverse and strange ways, and has shown finally his powers of strangulation by the ruining of windows, doors and furniture and so on, so that even the owner of house has given up and decided to move out. Occurring in the farmhouse Dutzow which belongs to the village of Sandfeld belonging to the Borough of Gadebusch in the region of Mecklenburg during the period between 26 January and 30 March 1722. A foreword of the Parson of Roggendorff follows an editing of the content of the judicial proceedings of the final exact examination of 27 witnesses including the people who have been in the house, also the watchmen who were ordered there and others. Described and communicated to the curious world from Heinrich George Haenell, administrator of Dutzow, printed by and available at the Inheritors of the late Thomas of Wierings, near the stock exchange in the golden A, B, C. 1722. (Archived in the National and University Library of Hamburg)

(Curieuse und wahrhaffte Nachricht oder Diarium, von einem Gespenst und Polter-Geist/ Welcher im Mecklenburgischen/ im Amte Gadebusch/ in dem zum Guth Dutzow gehörigen Dorff/ Sandfeld, in Hanß Jochim Duncckelmanns Haus/ vom 26 Januarii 1722. bis den 30 Martii a.c. auff gar vielfältige und Verwunderungswürdige Art und

Weise/ seine Affen -und Possen-Spiele/ zuletzt aber seine Würgerey/ mittelst Ruinierung/ Fenster/ Thüren und Mobilien etc. erwiesen/ so daß auch der Wirth das Hauß auffgesaget/ und weg zu ziehen resolviret. Nebst einer Vorrede des Herrn Pastoris zu Roggendorff/ nach genauer/ und Inhalts beygefügt Notarischen Instruments endlicher Examinirung XXVII. Zeugen/ als der im Hause gewesenen Leute/ auch der dahin commandirten Wächter und anderer. Beschrieben und der curieusen Welt communiciret von Heinrich George Haenell p.t. Verwalter zu Dutzow. Hamburg, gedruckt und zu bekommen bey seel. Thomas von Wierings Erben, bey der Börse im güldenen A, B, C. 1722.)

As can be seen from the title, this poltergeist case takes place in the house of Hans Jochim Dunckelmann in a village named Sandfeld and was active during the period January 22 until March 13, in the year 1722. The report is written in the form of a diary by the housing administrator, Heinrich Georg Haenell. He received the order to make such a report from a higher authority in the form of the head of the aristocratic estate of Dutzow, to which the village Sandfeld belonged to at the time. The order as such was to investigate and document the curious occurrences in the house of Dunckelmann. 27 witnesses are mentioned by names. Of interest are the different motives and themes in the case, which are also recurrent in fairy tales. After apparent heavy personal injury and damage to the property accompanied by many hours of praying, the case finally ended at a point in time when Dunckelmann was about to move himself after having previously sent away his own children.

Case Nr 4: from 1747.

Georg Wilhelm Wegner's Parson of Germendorf and Nassenheide/ Philosophical Tract/ on spirits/ in which a short account is given of the goblin of Wustermarck./ Horatius:/ Nos majus veriti, postquam nihil esse pericli/ Sensimus, erigimur." ("We who have feared for worse gain courage in having noticed that there is no danger."). Berlin, published by Haude and C. Spener, 1747. (80 pages, archived in Wolfenbüttel) (Georg Wilhelm Wegners/ Predigers zu Germendorf/ und Nassenheide/ Philosophische Abhandlung/ von/ Gespenstern/ Worinn zugleich/ eine kurtze Nachricht/ von dem Wustermarckischen Kobold/ gegeben wird./ Horatius./ Nos majus veriti, postquam nihil esse pericli/ Sensimus, erigimur. (Wir, die wir Schlimmeres befürchtet haben, fassen Mut, nachdem wir gemerkt haben, daß keine Gefahr besteht. Horaz, Satiren , 2. Buch, 8. Gedicht, Vers 57, 58.) Berlin, Zu haben bey Haude und C. Spener, 1747.)

In the year 1747 the parson of Germendorf and Nassenheide, Georg Wilhelm Wegner, together with his son and a friend, visited the parsonage of Wustermarck where a goblin was said to be acting up. The parson at Wustermarck had reported hearing various noises in his living room. Once it seemed as if someone pushed a big box along the floor (Wegner 1747, p.72), and sometimes he heard "a sound like from a heavy blow or a shove from which the house shook". Another time "something passed him which he could hear well but could see nothing" (Wegner 1747, p. 73). These and similar phenomena forced the parson to move his bed to another place. One evening he stood in front of his house and saw a figure of a "woman bearing some

form of head dress, standing in the bay window". This woman had greeted him and he had thanked her. After been seen for a while at this place, she then disappeared (Wegner 1747, p. 73). The occurrences in this vicarage are described in a one and a half page report which concludes with the words "this is everything from which a horrible goblin has been made....we have not seen or heard anything, even though we wanted to" (Wegner 1747, p.74). What is remarkable about this Wurstermarck case, is that although the story had been told by everybody for several years, as soon as concrete questions were posed, no one else, other than the parson involved in this case, claimed to know anything about this well known goblin. Because of this, the question arises: Is this a false case or is it merely a conspiracy of silence (Moser 1950, Von Lucadou 1983) or a even a conspiracy of repression (Bauer 1986)?

Case Nr 5: from 1749.

M. Johann Michael Fleischer's Reliable report on a ghost which manifested itself in 1749 in the parsonage of Schwartzbach and outside of it, through throwing things, ringing, rapping and appearing." Leipzig, published by Friedrich Lankisch's heirs, 1750. (51 §§, archived in Wolfenbüttel, Weimar and Munich)

(M. Johann Michael Fleischers Zuverlässige Nachricht von einem Gespenste, Welches sich 1749 zu Schwartzbach in der Pfarr-Wohnung, Auch ausser derselben, durch Werffen; Singen, Schlagen und Erscheinung geäußert hat. Leipzig, Verlegts Friedrich Lanckischens Erben. 1750.)

The case of Fleischer starts on the summer evening of 1749 with repeated blows being made against the windows of the parsonage of the village of Schwartzbach. At this point in time, the parsonage was occupied by the parson F. C. Schilling who had just replaced his predecessor, the late S. Wächtler. The household at that time consisted also of: Wächtler's widow, the mother and sister of Schilling, and a nearly 15 year old maid. The nightly bombardment of stones continued for nearly 10 weeks and it was also thrown with "excrements, toads, and similar beautiful things" (Fleischer 1750, § 41). What is unusual in this case is that those people who were hurt, were in fact seriously hurt by the stones, some of which were weighted as much as 7 pounds (Fleischer 1750, § 15, 23, 24, 36).

In addition to the bombardment with stones, other phenomena occurred which included strange sounds: "whistling from under the widow's feet with a beauty which was said to excel that of a nightingale" (Fleischer 1750, § 29). Objects were said to disappear and reappear in another place. "On one day the bread is taken from the cupboard, brought to the attic and placed on the stairs, clothes were rived off the washing line which was in the locked attic" (Fleischer 1750, § 34). As well as the above phenomena, features relating to haunting and not necessarily poltergeist incidents, occurred, as for instance a maid being grabbed by her hair (Fleischer 1750, § 24). Indeed as Fleischer described it, the Schwartzbach poltergeist appears to be a "special friend of the female gender" (Fleischer 1750, § 32). As for the evidential aspects, this case has "more than 50 independent witnesses who have seen and heard the throwing" (Fleischer 1750, § 42).

Case Nr.6: From 1760.

"About a Rare Race of Common Elementary and Domestic Spirits Along With a Curious Letter of a Mayor from the Year 1760 About his Three House Dragons or Goblins, Addressed to Professor D.Meier in Halle", in: *Horst, Conrad Georg 1825, Library of Magic or About Magic, Theurgie and Mantik, Magicians, Witches, and Witch-Processes, Demons, Ghosts and ghostly Appearances. For the Purpose of Promoting the Purely Historical Evaluation of These Matters, Free from Superstition and Ignorance. Published by Florian Kupferberg. Fifth Part. Mainz 1825. Pages 377-379.* (3 pages, archived in Wolfenbüttel and Freiburg)

("Von einer seltsamen Race gemeiner Elementar- und Haus-Geister, nebst einem merkwürdigen Briefe eines Dorfschulzen vom Jahr 1760 über seine drei Hausdrakens, oder Kobbolde an den verewigten Professor D. Meier in Halle." In: *Horst, 1825, Georg Conrad Zauber-Bibliothek oder von Zauberei, Theurgie und Mantik, Zauberern, Hexen und Hexenprocessen, Dämonen, Gespenstern, und Geistererscheinungen. Zur Beförderung einer rein-geschichtlichen, von Aberglauben und Unglauben freien Beurtheilung dieser Gegenstände. Sechs Theile. Mainz 1821 - 1826. Bei Florian Kupferberg. Fünfter Theil. Mainz 1825. Seite 377-379.*

In a letter dated the 26 August 1760 addressed to Professor D. Meier in Halle, the mayor of the village Uebnitz mentions three goblins or dragons that have a friendly relationship to him and without whom he could not have carried out his work. Some years ago when he was living in another place in the same neighbourhood, they had burnt down his house over his head simply because they disagreed with him over an important issue (Horst 1825, p. 377). However, they did help him to bring his personal belongings very quickly out of the house so that it was only the house and the boxes of the maids that became burnt. The fire was said to be ice cold and no one in the neighbourhood would come to his help because they said "it is a goblin's fire and it will stop on its own" (Horst 1825, p. 378).

In the course of this, there had been problems with the mayor's wife who did not want to accept his goblins although they apparently had promised her three barrels filled with money. Rather than being drawn into this, she went to the authorities and asked that they investigate the barrels that the goblins had apparently filled with pears, ashes and coffee. This changed his wife's opinion although it is not said how! The letter finishes off with the presumption that Professor Meier and his colleagues will not believe him, but he asserts that he is very certain of his own experience and "swears in black and white it to be the truth".

Some Phenomenological Aspects of these Six Historical Poltergeist Cases

The six cases are documented to varying degrees: four are described in a diary style (with respectively 154, 64, 62, 55 pages) while the details of two of them, the cases 4 and 6, are sketched on a mere 2-3 pages. The cases numbered 1, 2, 3 and 5 have been chosen as examples because they are so well described and the two short cases numbered 4 and 5 are included because they are not mentioned in the current literature and are in contrast to the others: case 4 is doubtful and its author doesn't believe in it at

all, and case 6 is unique because of its positive and humorous feature in that Professor Meier apparently has a lot of fun with his dragons.

The phenomena described in the six cases have been classified by me into 30 main categories with many further sub-categories. This enabled a comparison to be made of their characteristics with those occurring in modern cases described by previous researchers (Bozzano, 1920, 1930; Gauld & Cornell, 1979; Roll, 1976, 1977, 1978; Tizané, 1951; Huesmann & Schriever, 1989; and Cox 1961). An evaluation of the Gerstmann case in relation to Tizané's list of characteristics of poltergeist cases is to be found in Puhle, 1999 (298-300). Further details of the comparison of the six historical cases with modern cases will be reported later (Puhle 2000a). I report here only the most frequent phenomena occurring in the six historical cases that correspond to those found in the modern cases.

The Most Frequent Phenomena: When expressions such as “often”, “some” and “many” are used to describe daily occurrences, in order to arrive at the total for each category, these have been counted as one or more occurrence per day.

Inexplicable Movements of Objects

128 or more occurrences

Stones Playing a Role

75 or more occurrences

Bombardment

68 occurrences

Bombardment of a Person

36 occurrences

Breaking and destroying of things (with the exception of glass windows)

55 occurrences

Stones Breaking Glass Windows and Entering Inside through Openings

49 or more occurrences

Thrown Objects

39 or more occurrences

Which are hot when touched

5 occurrences

Visual Appearances

37 occurrences

The Significance of These Six Historical Cases for Current RSPK-Research

In these six historical cases it has not been possible to identify focal persons, as for example pubescent young persons. The whole family, including the children, is involved in only 4 of these cases. In the case of Fleischer, the phenomena centred on female persons while in the Gerstmann case, males were the focus. Certainly there appear to be focal persons in the two briefly reported cases (Wegner and the Mayor of Ueblitz) but in one of these, the author of the report actually doubts the authenticity of the case. It is impossible to read into the statements given in these cases, anything

about the psychopathological status of the family members or any indications of family tension. Gauld and Cornell in their discussion of 500 cases conclude that only in a very few cases are there phenomena that appear to be independent of a single agent or medium (Gauld & Cornell 1979, p. 342). Bender says about himself and other modern poltergeist-researchers like Roll, Cox, Eisler, Larcher, Palmer, Pratt and others, they would characterize poltergeists cases "*als ob es keine andere "agency" gäbe als die Fokus-Person oder -Personen, die "Medien"*" (as having no other "agency" than the focus-person/persons or the "media" (Bender 1979, p. 134.) One can only say in the cases reported here that either signs of psychopathology, symptoms of illnesses such as *epilepsy* or *CNS disturbances* are not present in the descriptions (which otherwise might have supported Roll's theory (Roll 1977, p. 409). (Compare however the critique of this theory made by Martinez Taboas and Alvarado 1981.) On the positive side, the parson Heinisch emphasised that "it is completely unreasonable to attribute a natural explanation for the case to pure fantasy, idol imagination, melancholic temperament or disease" (Heinisch 1723, p. 38).

Domestic and industrial electromagnetic fields acting as potential releasing factors for poltergeist phenomena (Nichols 1998) cannot of course be applied to the phenomena occurring during those two centuries. Household electricity and industrial applications started in the USA and Europe very slowly following Edison's invention of the electric bulb in 1879 and Siemens' invention of the electromotor in 1866.

The role of natural electrical fields in the form of geomagnetic activity is of course not excluded in these cases. The investigations of Wilkinson and Gauld (1993, p. 304-305) as well as Roll and Gearhart (1974), Gearhart and Persinger (1986), have all found that the onset of poltergeist cases correlates with significantly higher global geomagnetic activity.

A virtually non-researched factor concerns the religious belief system and "Weltanschauung" (worldview) of the person concerned. It is very remarkable that three of the cases reported here actually take part in Protestant parsonages and in the fourth case, the physician Gerstmann has a daily contact with the parson who is a chief witness to the case. In the fifth case, many hours of the day are said to be devoted to prayer. The exception is the sixth case, the major of Uebnitz with his three friendly house dragons, where a more independent attitude to the church - in this case the Catholic Church - is to be found (Horst 1825, p. 379). If what he writes to Professor Meier in Halle is taken as face value, then in contrast to other cases he actually experiences fun in having the poltergeists (Horst 1825, p. 377).

This brings us to the wider issue of the threatening versus the friendly nature of the poltergeist. It is known from ethnology that ghosts that are not one off acts (crisis apparitions) but are experienced as outside of villages and in general as hanging around human settlements, and as such are understood to be threatening. On the other hand, ghosts living inside a house or barn, have been traditionally experienced as positive. Negative values have become attributed to all ghostly appearances only since the time of Christianity which looked negatively upon all ghostly appearances which cannot be attributed to angels. This has become evident since Lutheran times for the German speaking areas, by the way in which swear words are applied for these original friendly house companions: The house goblin becomes used in the swear words like *Poltergeist*, *Fratzteufel*, *Hausteufel* (house devil), *Rumor-and Polterteufel*

(polter-devil), *Teufels-Affe* (devil ape), *Hexen- and Teufelsgespenst* (hex- and devil-ghost). The house goblin even becomes a *Drachen* or *Draken* (dragon), *Spuk-*, *Schreck- and Dreckgeist* (horror ghost), a *Scheisshäuser* (toilet user) and *Rabbaudermannen* (little trouble maker) (Horst 1825, p. 349, Horst 1825, vol. 1, p. 248, Gerstmann 1714, pp. 3,13, 17, 99, 119). All in all, the goblin becomes a rather hellish ghost.

In contrast to this dire image, the German folklore also tells of the delightful aspects of these goblin-like ghosts, which if we look at them from the larger world perspective, are to be regarded as the largest class of ghosts. For instance, Schott in his treatise *Physica Curiosa*, says that "the Germans would call these little goblins *Gutelen* because they are so *gut* (good) towards the people". More examples of the positive character of goblins are given in Puhle (1999, p.p. 303 and 304, see also Puhle, 2000). The house ghost has thus been in causal or analogue context with Christianity, converted from a friend into an enemy of human beings. Indeed, evil ghosts were originally experienced in the outer environment but now they are perceived in the domestic environment. This is mirrored in the way RSPK phenomena progress from stone throwing effects outside the house, to disturbances which take place inside the house (cases 1, 2 and 5). This is an aspect that was described by, among others, Tizané (1951) on the basis of his one hundred French cases. Bender described the throwing of stones as "an archaic form of aggression"; it is transcultural and occurs in the barbaric form of punishment as stoning to death (Bender 1979, p.136). Our contemporary poltergeist is thus a house-ghost which has lost its identity - like a fallen angel, it has become a fallen house ghost.

Do the historical cases give us a new key for understanding poltergeists by showing how the form of thought and belief, and the resulting worldview are related to the way in which poltergeists are perceived and experienced? It is instructive in this context to think of what Wegner wrote in 1747: "Even if I cannot define what ghosts are, I think I can declare that they cannot be what you believe them really to be" (Wegner 1747, p.6).

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Finding Psi in the Paranormal: Psychometric Measures Used in Research on Paranormal Beliefs/Experiences and in Research on Psi-Ability⁶

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Abstract. A large research effort is currently being aimed at finding reliable measures of paranormal beliefs/experiences and psi-abilities. This article reviews how the use of psychometric instruments for this purpose is steered to a large extent by the underlying model or ideology concerning what psychic experiences are. The review updates previous reviews of instruments used in research on paranormal beliefs/experiences (Irwin, 1993) and in forced-choice ESP-studies (Lawrence, 1993) and also supplements these with a review of instruments applied in free-response ESP-studies. Altogether 147 studies published between 1993 and 1999 were retrieved and these were found to have used a total of 149 different questionnaires, tests, and sets of items. However, of these various psychometric instruments, only 43 claimed to measure paranormal beliefs/experiences and the remaining related to other areas of psychological functioning. The trend noted in a previous review (Irwin, 1993) of focusing on the possible dysfunctional aspects of psychic experiences (e. g. lack of critical thinking ability and proneness to psychosis) has continued unabated in recent years. Amongst the belief scales, *The Paranormal Belief Scale* (Tobacyk & Milford, 1983) is the most widely used instrument. It is also a popular instrument applied in forced-choice ESP-studies although it has not as yet been used in free-response ESP-studies. *The Australian Sheep-Goat Scale* (Thalbourne & Haraldsson, 1980) continues to be one of the most accepted instruments in research on ESP, and is one of the few instruments used in all areas of the research reviewed here.

In reviewing the literature concerning paranormal beliefs and experiences, and free-response ESP-studies, the fact that researchers have different aims in their work is reflected in their specific choice of two main areas of research problems. Some researchers have concentrated on issues concerning personality and other characteristics that paranormal believers and experiencers might have in common, and which might, at least to some extent, explain these beliefs and experiences. Other researchers have focused on predictor variables for real rather than apparent paranormal ability in the form of success in psi-experiments. Because of this, investigators have used various kinds of measures in their work that reflect these different approaches. Several reviews and meta-analyses have been published on this work (e.g. Bem & Honorton, 1994; Honorton, 1995; Honorton & Ferrari, 1989; Irwin, 1993; Lawrence, 1993; Milton & Wiseman, 1999; Palmer, 1978; Steinkamp & Milton, 1998). However, in some of these reviews and meta-analyses, the measures that have been used are clearly listed but in others, they are not.

It is estimated that between 25-45% of the western population report subjective paranormal experiences and some 35-50% report a belief in the existence of paranormal phenomena (Blackmore, 1984; Clarke, 1991; Gallup & Newport, 1991; Grimmer & White, 1990; Sjödin, 1998; West, 1995). Much of the research to date on paranormal

⁶ This paper was independently reviewed by Jan Dalkvist.

beliefs and experiences has been directed towards investigating the characteristics that distinguish the believers/experiencers as a group from other groups and the characteristics the members of this group share.

Given this, and with such a high proportion of people believing in paranormal phenomena, it seems logical to expect there to be numerous personality characteristics that correlate with paranormal beliefs. It could be argued that also given the complexity of human experiences and beliefs, then paranormal beliefs and experiences are bound to have something in common with other beliefs and personality characteristics. Of course the downside is that the apparent link here may be weak or even non-existent. This is of course an inherent recurrent problem of all correlation studies but here it is confounded by a second major problem, namely that of defining what a genuine paranormal experience actually is.

Because there are different practices where different researchers define the term "paranormal" in different ways, the choice of psychometric instruments used to measure paranormal beliefs/ experiences varies accordingly. Even if there is a consensus among researchers in the field of parapsychology about which phenomena parapsychology should include in the definition of what is paranormal (see Irwin, 1999 for a review), this consensus is not always reflected in the way questionnaires are developed. The three basic defining domains of parapsychological research covered by Irwin (1999) are: extrasensory perception, psychokinesis, and the survival hypothesis. Some questionnaires used by parapsychologists define paranormal beliefs inside all three basic domains. For example the *Australian Sheep-Goat Scale* (AS-GS)⁷ (Thalbourne & Delin, 1993) complies well with the above definition. Others however, in attempting to measure paranormal experiences, include phenomena that lie outside the above domains. For example the *Paranormal Belief Scale* (PBS) (Tobacyk & Milford, 1983) claims to measure seven factors of paranormal belief but includes aspects that most parapsychologists would regard as 'beyond the pail' - such as the "Belief in Witchcraft" and the "Belief in Extraordinary Life Forms".

A meta-analysis by Lawrence (1993) looked at the influence of belief in ESP on scoring in forced-choice ESP-tests. In the meta-analysis, Lawrence (1993) listed some common measures used to assess paranormal beliefs. These were: Schmeidler's (1943) *Criterion 1 question* ('Do you believe it is possible that ESP can be shown under the conditions of this experiment?'), the *AS-GS*, the *Incomplete Sentence's Questionnaire* (ISQ) (Van de Castle & White, 1955), and the *Sheep-Goat Questionnaire* (S-GQ) (Bhadra, 1966). Lawrence noted that some measures of paranormal beliefs, although potentially useful, had not been used, namely the *PBS*, and the *Belief in the Paranormal Scale* (BPS) (Jones, Russell & Nickel, 1977). Perhaps because of the above over-inclusion problem, these two measures had failed to cross over from mainstream psychology to parapsychology.

It becomes evident from this that there exist numerous quite different questionnaires, all of which claim to actually measure the same thing, namely paranormal beliefs and experiences. It is of interest to know if Lawrence's (1993) above finding concerning which measures of paranormal belief have been used in forced-choice studies, is still valid today. The complaint of parapsychology and transpersonal psychology was

⁷ A key to abbreviations of measures is found in Appendix 1.

epitomised by Irwin's (1993) statement that the research by sceptics of the paranormal was often conducted with the objective of demonstrating that paranormal believers were deficient in some area of psychological or social functioning.

Already in 1993, Irwin found that a range of measures had been used. He listed: the *S-GQ*, the *AS-GS*, the *PBS*, the *BPS*, the *Belief in Psychic Events* (BPE) (Sheils & Berg, 1977), the *Extraordinary Belief Inventory* (EBI) (Otis & Alcock, 1982), the *Supernaturalism Scale* (SS) (Randall & Desrosiers, 1980), as well as individual items used in a survey (Sobal & Emmons, 1982). How have these measures fared since then? In the same year Lawrence reviewed the instruments that had been used in forced-choice ESP-experiments. In later years free-response ESP-studies (in the form of ganzfeld and remote viewing methodologies) have become predominant so it is also of interest to know the form of psychometric instrumentation that has been applied in this area.

Aims

The principal aim of this review was to record which personality and other instruments researchers have applied in studying people with paranormal beliefs and experiences, and in studying participants in ESP-experiments. Trends and findings from the period under review (1993-1999) can then be compared with those earlier reported by Irwin (1993) and Lawrence (1993). The review highlights possible differences between forced-choice ESP-studies and free-response ESP-studies. In looking at the psychological studies of paranormal belief, it is naturally of interest to see if there is still a basis to Irwin's (1993) claim that this area seemed to be dedicated to demonstrating deficiencies in the psychological functioning of paranormal believers. Because of the multiplicity of instrumentation, it is however outside the scope of this review to comment on the psychometric qualities of the measures. For the same reason, it is not possible to evaluate the predictive validity of the measures. For instance if a link of an instrument to psychotic personality is claimed, do they actually predict psychosis? If a link to psi-ability is claimed, does it actually predict psi-task performance? Obviously, although these are crucial questions, they cannot be answered here.

The researchers instrument of choice depends not only on whether a correlation study is being conducted but also on the general approach towards paranormal phenomena. For this reason it is appropriate to first present the various underlying theoretical ideologies that to a large extent have steered the use of psychometric instruments.

Approaches to Explain Paranormal Phenomena

Although there are several approaches explaining the occurrence of paranormal beliefs and experiences, it is also evident that there are no strict boundaries between these approaches. Even if they are here under different headings there is some overlap. In short, the clinical approach explains paranormal beliefs and experiences in terms of psychopathology, for example schizotypal personality disorder and psychosis proneness. The cognitive approach explains the phenomena in terms of cognitive deficits such as probability misjudgement and cognitive bias. The neurobiological approach has explanations that involve brain functions and dysfunctions. In contrast to the previous approaches, the psi approach states that some people actually objectively experience what they claim to be experiencing.

The Clinical Approach

According to the clinical approach, paranormal experiences such as telepathy are signs of psychosis. Symptoms of psychosis include delusions and hallucinations (American Psychiatric Association, DSM-IV, 1994), and some of the symptoms of the pre-psychotic disorder known as schizotypal personality disorder are cognitive or perceptual distortions including "odd beliefs or magical thinking that influences behaviour and is inconsistent with sub cultural norms (e.g., superstitiousness, belief in clairvoyance, telepathy, or 'sixth sense' " (DSM-IV, 1994, p. 645). Magical thinking is defined as the belief in forms of causation, which by conventional standards are considered to be invalid (Eckblad & Chapman, 1983). From the point of view of psychometrics, psychosis can be seen as an extreme of a continuum rather than as a separate diagnostic entity (Eysenck, 1992). According to this way of thinking, schizotypal personality disorder actually belongs to what is "normal" but is placed at the end of the continuum, close to psychosis.

Schizotypal personality has in fact been shown to be a multidimensional occurrence (Mason, Claridge & Williams, 1997). The first factor is identified as **positive schizotypy** and has loadings from scales pertaining to unusual perceptual experiences, thinking styles, and beliefs. One of the schizotypy scales, the *Magical Ideation Scale* (MIS) (Eckblad & Chapman, 1983), has been used in parapsychological research. However, it is worth stressing that positive schizotypy is not thought to be necessarily pathological in itself (Mason et al., 1997). The second factor, that of **negative schizotypy** is defined by the presence of so-called social anhedonia (social withdrawal). A third factor has been identified, that of **cognitive disorganization/social anxiety**, and finally a fourth factor, labelled **impulsive nonconformity/asocial schizotypy** has been added.

Although positive schizotypy in itself is seen as a "sub clinical" expression of psychotic tendency people who scored high on the MIS were found to report more psychotic-like experiences, more schizotypal experiences, more affective symptoms, and also reported more concentration problems than a control group (Eckblad & Chapman, 1983). A longitudinal study found that individuals with high scores on the MIS and the *Perceptual Aberration Scale* (PAS) (Chapman, Chapman & Raulin, 1978), did actually report 10 years later more psychotic episodes, psychotic relatives, and schizotypal symptoms than did a control group (Chapman, Chapman, Kwapil, Eckblad & Zinser, 1994).

There are indeed a number of studies finding correlations between paranormal experiences and concepts along the psychosis/normality continuum. Partly because of this, Thalbourne, Bartemucci, Delin, Fox, and Nofi (1997) claim there is a common thread underlying paranormal beliefs and experiences, mystical experiences, magical ideation, manic experiences, and creative personality which they call **transliminality**. Transliminality is defined as "a cognitive/personality dimension characterized at the high end by psychosis, and at lower levels by borderline disorders and a normal range of manifestations. Paranormal belief and experience, creative personality, mystical experience, manic-like and depressive experience, and magical ideation may all be conceptualised as aspects of a mind high in transliminality" (p. 306).

Although the notion of transliminality offers the prospect of some integration between the psychopathological and parapsychological approaches, it brings with it the

same weakness that the concept of paranormal belief/experience itself suffers from, namely that of heterogeneity. With a high proportion of individuals believing in paranormal phenomena, the variable "paranormal belief" might be expected to have something in common with other beliefs and personality variables. The real question concerns whether or not this commonality is a stable core with causal links to paranormal experiences or whether it is merely a shifting sand with various contours. Thalbourne et al. (1997) make a case for the existence of transliminality as a core of experiences that fall under a total of 11 interwoven variables. The critic might however regard this limit as still entirely arbitrary and ask how many more variables that have not as yet been studied might eventually come to be added? As with the broad concept of paranormal belief, transliminality might indeed have much in common with many other beliefs and personality factors but the key question is does it have a clear causal relationship to what seem to be *genuine* psi-experiences?

The Cognitive Approach

The cognitive approach uses research findings on causality, cognitive bias, illusion of control, and cognitive errors in order to explain how individuals consistently misinterpret coincidental normal events and label them as paranormal ones. Chance coincidences in life become meaningful by being given such a paranormal attribution. Given this, selective memory can then be conveniently used to remember these meaningful events and maintain the belief system.

The research following this track has accordingly been directed towards identifying differences between paranormal and occult believers and "normal" non-believers. This leads naturally to the cognitive deficits hypothesis, which states that paranormal believers are illogical, irrational, credulous, foolish, and uncritical (Irwin, 1993).

Causality

Some findings here do not actually fit the above simplistic model so well. In one study, subjects who were members of a spiritual community were compared with standard subjects who were not members. The members were found to have a higher internal orientation and to express belief in a more personal responsibility. They also showed a stronger belief in the universe being ultimately fully determined (Lesser & Paisner, 1985).

A related finding is the type of causality associated with the paranormal beliefs that schizophrenic patients show. This apparently differs from the concept of causality associated with the paranormal beliefs shown by members of a psychical research society (Williams & Irwin, 1991). The members of the psychical research society framed their causal concepts in terms of *personal responsibility* and in seeking *meaningful connections*, whereas the schizophrenic patients demonstrated a reliance on the *role of chance* in various areas of life. The authors concluded that a paranormal belief system could for some people, be used, as a cognitive defence against acceptance of the uncertainty of life events by creating meaningfulness out of coincidences or it could be indicative of psychopathology.

Cognitive Bias and Illusion of Control

The tenet here is that paranormal belief systems help sustain psychic integrity and to do so they operate in practice as a cognitive bias (Schumaker, 1990). According to this view, a need arises to distort reality simply because reality often is just too unpredictable and unreliable. Illusions of the existence of psychic ability serve then to make people think of reality as more controllable and perhaps nicer and less threatening than it really is. Persons who believe they can control an event they in reality cannot control, might then be expected to show a healthier psychological functioning than persons who (rightly) do not think they can control chance events (Martin, Abramson & Alloy, 1984).

Following from this, an important factor in paranormal beliefs is the belief in one's ability to correctly judge the role of chance. One study found that paranormal believers were more likely to misjudge the likelihood of an event happening and showed a greater illusion of control than others (Blackmore & Troscianko, 1985). This study has however been criticised for its use of an inappropriate means of estimating what chance is (Parker, 2000b). The chance estimate was the dice throwing score that subjects believed they would obtain with their eyes closed. Such a procedure might have led some subjects to believe that their scores under this particular condition would actually be under chance level. The above results were nevertheless replicated in another study where again paranormal believers were found to be more inclined to attribute personal involvement in randomly determined processes than non-believers (Brugger, Regard & Landis, 1990). However, in a large newspaper survey, no support was found for the probability misjudgement theories which predict that paranormal believers would show worse probability judgements and greater underestimates of chance coincidences than non-believers (Blackmore, 1997).

Reasoning Skills

It has been suggested that paranormal beliefs might be correlated with reasoning ability, especially when the reasoning task contains apparent paranormal content (Wierzbicki, 1985). However, studies concerning reasoning ability show different results, which appear to be dependent on the context in which paranormal beliefs are measured (Irwin, 1991). Generally participants tend to behave in ways which show compliance with the researcher's own attitudes, in this case to paranormal phenomena. Context has been shown to be of importance when asking people about their paranormal beliefs. Two context-related statements were used in one study (Smith, Foster & Stovin, 1998): one pro-paranormal and one anti-paranormal. As hypothesised the paranormal belief scores were on average highest in the pro-paranormal condition and lowest in the anti-paranormal condition.

It could of course be the case that reasoning and critical thinking are related to certain paranormal beliefs and not to others (Tobacyk & Milford, 1983). One study for instance found religiosity and spirituality to correlate negatively with certain aspects of critical thinking (Morgan & Morgan, 1998).

The Neurobiological Approach

The approach attempts to localise paranormal phenomena to the activity or even possible dysfunction of certain structural areas in the brain, in particular the temporal lobe. (Persinger, 1983, Roll & Persinger, 1998). Some significant correlations have been

reported between paranormal experiences and temporal lobe symptoms (Neppe, 1983). Cook and Persinger (1997) have reported that the stimulation of the temporal-parietal area with a weak magnetic field that simulates the brain's activity, can produce a sense of presence, visions, out-of body-experiences and even psychic experiences. There did seem to be a causal relationship between the sense of a mystical presence, in one exceptional participant who increased the number of his button presses as the complex magnetic field was being increased without his knowledge.

Fascinating as this work is, much of it remains as yet unpublished and the above study would seem to be the nearest there is to a control group. We need to know what the expectancy effect, created by just going through the procedure of lying in "Persingers Chamber" without a magnetic field, produces.

A recent study by workers in Zurich and Freiburg (Pizzagalli et al, 2000) looked at the EEGs of strong believers and disbelievers in the paranormal. They found extreme believers (who had very high scores on a schizotypy scale, the *MIS*) to have relatively higher right hemispheric activation and reduced hemispheric asymmetry of functional complexity. However, since there was no 'normative' group with which to compare the extremes with, the conclusions of the study allow interpretation in either direction: they could be conversely interpreted as a study of EEG peculiarities of strong disbelievers!

Moreover, the nature of the causal link is still rather unclear given that altered states of consciousness appear in general to involve both altered brain stem arousal and temporal lobe activity but at the same time promote the occurrence of spontaneous paranormal experiences.

It is possible that the neurobiological approach can eventually provide a basis for understanding paranormal phenomena but too little is known today to be categorical about it.

The Psi-Ability Approach

The clinical and cognitive approaches share the common starting point that genuine psi does not exist. The neurobiological approach does not always expressively state whether psi exists or not, but focuses on the brain correlates of paranormal experiences. The central assumption underlying the psi-ability approach of course is that at least some paranormal phenomena are genuine and may require new explanatory principles. These four approaches need however not be mutually exclusive. It is for example possible that genuine psi-experiences may occur in the context of fluctuating psychotic states or may lead to an exaggerated, over-inclusive belief system. Moreover, the psi-ability approach does have an empirical basis (Bem & Honorton, 1994; Dalton, 1997; Lawrence, 1993; Steinkamp & Milton, 1998).

Although there is no generally agreed on theory explaining psi, there is no lack of possible theories. There are, for example electromagnetic theories which state that psi is mediated by some form of electromagnetic radiation, energy field theories that attribute psi to some form of physical energy, elementary particle theories which deal with the possibility that some elementary particles may pass through matter and also set up a field which interacts with the experient's brain, and observational theories which involve the ideas of quantum mechanics (see Irwin, 1999 for a review).

Predictor Variables for Experimental Success in ESP-Studies

Some of the variables that have been used in the attempts to explain paranormal phenomena have also been used to predict which subjects can be successful in ESP-experiments. Psychosis-proneness is one such variable. The *MIS*, which measures positive schizotypy, has shown positive correlations with experimental success (Parker, 2000a; Lawrence & Woodley, 1998).

The *Transliminality Scale* (TS) (Thalbourne et al, 1997) has been used to predict psi test scores but has so far shown mixed results. In a precognition test the core transliminality-relevant variables failed to predict precognition scores (Thalbourne, 1996). The positive part of the *TS* was used to predict psi-scores in ganzfeld experiments but failed to discriminate hits from misses (Parker, 2000a). However, in an experiment with the *I Ching* (an ancient Chinese form of divination), scores on the *TS* correlated significantly with hitting (Storm & Thalbourne, 1998-99).

Neuroticism as measured by various instruments (e.g. the *Eysenck Personality Inventory* (EPI) (Eysenck & Eysenck, 1964), *Cattell's 16 Personality Factors* (C16PF) (Cattell, 1965), and the *Minnesota Multiphasic Personality Inventory* (MMPI) (Hathaway & McKinley, 1951)) has been reported to correlate with experimental success in some studies but not in others (Palmer, 1978). The positive correlation between extraversion and success in ESP free-response studies seemed to be robust in a meta-analysis (Honorton, Ferrari & Bem, 1998), but this correlation has failed to achieve significance in other free-response ESP-experiments (Dalton, 1997; Parker, 2000a). The Honorton et al. (1998) meta-analysis also investigated forced-choice ESP-studies, but the significant ESP/extraversion relationship found there, may well have been an artefact of subjects' knowledge of their ESP-performance effecting their responses to the extraversion measure.

Creativity seems to be a promising correlate of experimental success in the ganzfeld. Schlitz and Honorton (1992) reported an overall significant hit rate in a ganzfeld study using students from a school for the performing arts. The music students produced the highest success rate (75%, MCE being 25%). When examining the relationship between the ganzfeld performance and creativity as measured by the figural form A from the *Torrance Tests of Creative Thinking* (TTCT) (Torrance, 1990), it was found that following the removal of two outliers from the data, the correlation was positive and marginally significant. Morris, Cunningham, McAlpine and Taylor (1993) reported significant psi results in a ganzfeld study using subjects selected for extraversion, belief in the existence of ESP, and possession of musical or artistic ability. Creativity was measured by simply asking the participants questions about their creativity. While the overall correlation between self-rated creativity and success was not significant, participants who rated themselves highly on both the artistic and musical creativity questions performed significantly better than the low creative ones. Dalton (1997) reported overall significant psi results in a study using creative subjects. Although all the subgroups in this study (musicians, artists, creative writers, and actors) showed significant success in the ganzfeld, it was only for the musicians that the correlation was significant between ganzfeld success and creativity (measured by the verbal form of the *TTCT*). From these studies it can be concluded that although the work with creative populations seems promising, it is as yet unclear how to best measure creativity.

Creativity is a difficult construct to study partly because it has been defined in different ways by different researchers and has therefore also been measured by different types of instruments (Barron & Harrington, 1981; Eysenck, 1997).

High scores on the Feeling and Perceptive factors of the *Myers-Briggs Type Inventory* (MBTI) (Myers & McCaulley, 1985) were included as important factors for initial success in the ganzfeld in the four-factor model outlined by Honorton & Schechter (1987). In a meta-analysis, scores on Feeling/Perceptive correlated significantly with ganzfeld success (Bem & Honorton, 1994) although these were criticised on methodological grounds by Milton & Wiseman (1999). In another study, only Feeling correlated significantly with psi-performance (Parker, 2000a).

Openness towards inner experiences as measured by the *Tellegen Absorption Scale* (TAS) (Tellegen & Atkinson, 1974) and the *NEO Personality Inventory* (NEO-PI) (Costa & McCrae, 1992) has also been proposed as an important factor in predicting ESP success (Stanford & Angelini, 1984). While Openness has been found to correlate positively with ganzfeld success in one study (Zingrone, Alvarado & Dalton, 1998-99), in others it has failed to show a significant correlation (Bierman, 1995; Broughton & Alexander, 1997; Parker, 2000a).

Paranormal belief is claimed to be one of the most consistent effects in predicting performance in forced-choice ESP-tasks (Lawrence, 1993). Quite simply people who believe in ESP score higher on average than people who do not. Paranormal beliefs and experiences have also been claimed to be correlates of success in the ganzfeld (Bem & Honorton, 1994). The recent meta-analysis by Milton and Wiseman (1999) also investigated the relation between paranormal beliefs/experiences and experimental success but found that the information about prior paranormal beliefs/experiences in the new studies was lacking.

Method

Studies on paranormal beliefs and experiences, and ESP-experiments published between 1993 and 1999 that used psychometric measures are included in this review.

Table 1. Search words for PsycLit.

The search was limited to studies published between 1993 and 1999.

Search words	hits
1. Paranormal belief	35
2. Psi belief	3
3. Anomalous belief	0
4. Sheep-Goat	14
5. ESP belief	0
6. Paranormal experience	9
7. Psi experience	1
8. Anomalous experience	4
9. ESP experience	1
10. Anomalous cognition	8
11. Ganzfeld	41
12. ESP experiment	5

The studies were retrieved using search words (see Table 1) in the computer database PsycLit, and by going through the proceedings of papers presented at the annual conventions of the Parapsychological Association for these years.

Results

Altogether 147 studies were retrieved, and of these, 71 belonged to the group of ESP-ability experiments and 76 to studies on paranormal beliefs/experiences. A major group of the ESP-experiments, 43 in number, were studies using the ganzfeld technique. Many ganzfeld-studies had actually been carried out earlier than the period for this review but featured in contemporary meta-analyses of ganzfeld-studies. Of the remaining 28 ESP experimental studies, 25 were forced-choice studies, 2 were free-response studies, and 1 was a study that could be classified as both an ESP-study and a PK-study.

The total number of questionnaires, tests, and sets of items used in ESP-experiments and studies on paranormal beliefs/experiences was 149. Of these, 43 (29%) were instruments that claimed to measure paranormal beliefs and experiences. Because of the unwieldiness of presenting all the 149 measures, only those measures that have been used in three studies or more will be presented here. The complete list of measures is found in Appendix 1.

Studies of Paranormal Beliefs and Experiences

The measures used in 3 or more studies on paranormal beliefs and experiences are presented in Table 2. The complete list of measures used in this kind of research is found in Appendix 2. Since the same researchers might have used a particular questionnaire in more than one study, the number of research groups gives a more accurate picture. A research group is defined as researchers publishing their work together. Researchers belong to the same group if they have at least one joint author in common. For example the studies by Thalbourne & Delin, by Thalbourne & Smith, and by Smith & Anderson would all be identified as belonging to the same research group. 29 research groups were responsible for the 76 studies of paranormal beliefs and experiences. A total of 115 different questionnaires, tests, and sets of items have been used in this kind of research. Of these 33 (29%) were claimed to measure paranormal beliefs/experiences.

The *Anomalous Experiences Inventory* (AEI) (Gallagher, Kumar & Pekala, 1994), the *AS-GS*, the *PBS*, the *Questionnaire of Psychic Experiences* (QPE) (Zingrone & Alvarado, 1994), the *Mysticism Scale* (MS) (Mehrabian, Stefl & Mullen, 1997), the *Mystical Experience Scale* (MES) (Thalbourne, 1991), and the *Survey of Belief in an Afterlife* (SBA) (Thalbourne & Williams, 1984) were the major instruments used to measure paranormal beliefs/experiences. Four questionnaires listed in Irwin's (1993) review, had apparently not been used in the later studies. These were: the *BPS*, the *BPE*, the *EBI*, and the *SS*.

The *CI6PF*, the *EPQ*, and the *Mehrabian PAD Temperament Scales* (MPADTS) (Mehrabian, Stefl & Mullen, 1997) were the major instruments used to measure personality. The MPADTS derives from the *PAD Temperament Model*, which is claimed to be heuristic for a general description of personality and psychopathology. It includes three basic dimensions: Trait Pleasure-Displeasure (P), Trait Arousability (A), and Trait Dominance-Submissiveness (D).

The Clinical Approach

Some of the measures having a connection to the clinical approach are presented in Table 2, although most of them have not been used in more than 3 studies and are therefore to be found in Appendix 2. These instruments typically measure schizotypy, mania, depression, and anxiety. 5 different questionnaires/sets of items have been used to measure psychosis-proneness. The vast majority of the hypotheses concerning the use of these measures have predicted that paranormal beliefs would be negatively related to these measures. Many studies must be considered as being purely exploratory in the sense that hypotheses concerning the outcomes have not been stated. The only clearly positive measures were the *Life Experiences Questionnaire* (LEQ) (Kennedy & Kanthamani, 1995) and various questions on health, well-being and meaning in life (Kennedy, Kanthamani & Palmer, 1994). These measures have been used by the same research group in two studies.

Table 2. Measures used in 3 or more studies on paranormal beliefs/experiences.

Measure	Number of studies	Number of research groups
Anomalous Experiences Inventory	5	3
Australian Sheep-Goat Scale	24	4
Cattell's 16 Personality Factors	4	1
Creative Personality Scale	5	1
Demographic questions*	7	6
Dissociative Experiences Scale	6	5
Eysenck Personality Questionnaire	5	3
Globality Differentiation Scale	4	1
Inventory of Childhood Memories and Imaginings	4	3
Magical Ideation Scale	13	4
Manic Depressiveness Scale	7	1
Mehrabian PAD Temperament Scales	3	1
Mystical Experience Scale	7	1
Mysticism Scale	3	1
Paranormal Belief Scale	21	16
Questionnaire of Experiences of Dissociation	3	2
Questionnaire of Psychic Experiences	3	1
Sensation Seeking Scale	3	2
Social Desirability Scale	3	3
Survey of Belief in an Afterlife	3	1
Tellegen Absorption Scale	6	4
Transliminality Scale	5	1

* Demographic questions is not one set of items, different researchers have used different questions.

The Cognitive Approach

Most of the measures with a connection to the cognitive approach of explaining paranormal beliefs/experiences have in fact been used in less than 3 studies and are therefore omitted from Table 2 (but can be found in Appendix 2). These were instruments claiming to measure intelligence, ambiguity tolerance, cognitive style, conservatism, locus of control, and critical thinking ability. Often the link to paranormal beliefs was hypothesised to have a connection with dysfunction - as was the case concerning paranormal believers' ability of critical thinking, ambiguity tolerance, and intelligence.

The Neurobiological Approach

Only 2 measures (the *Complex Partial Epileptic Signs Scale* (CPESS) (Simmonds & Roe, 1999) and the *Temporal Lobe Symptoms Scale* (TLSS) (Persinger, 1983)) were found which had a clear connection to the neurobiological model. There is in other words still a lack of research in this area.

The Parapsychological or Psi-ability Approach:

ESP Ganzfeld Studies

As noted earlier, the ESP ganzfeld-studies form the largest block of the experimental studies. The measures that were used in 3 or more ESP ganzfeld-studies are presented in Table 3. The complete list of measures used in this kind of research will be found in Appendix 2.

Table 3 Measures used in 3 or more ESP ganzfeld studies.

Measure	Number of studies	Number of research groups
Australian Sheep-Goat Scale	3	1
Magical Ideation Scale	4	2
Myers-Briggs Type Indicator	23	3
NEO Personality Inventory	12	3
Participant Information Form	29	3
Sense of Coherence Scale	3	1
Tellegen Absorption Scale	3	2

The above 43 ESP ganzfeld-studies have been published by 6 research groups. In total, 21 different questionnaires, tests, and sets of items have been used in these studies. Of these, only 4 (19%) claimed to measure paranormal beliefs/experiences. The *Participant Information Form* (PIF) and the *AS-GS* were the two common instruments used to measure paranormal beliefs/experiences. The *PIF* is a questionnaire that covers many different aspects of the participant's background such as prior experiences, interests, and characteristics (Morris, Dalton, Delanoy & Watt, 1995).

The major instruments used to measure personality variables were the *MBTI* and the *NEO-PI*. The *NEO-PI* is claimed to measure Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Different versions of the same questionnaires,

for example the revised version of the *NEO-PI* and versions translated into different languages, are all identified as the *NEO-PI* here.

The *MIS*, which given its partial pathological bias can be regarded as belonging to the clinical approach, has been used in 4 studies. It would however be wrong to say that the hypotheses in these studies were only linked to this pathological aspect, since the researchers using this measure hypothesised that schizotypy may be an indicator not only for psychosis-proneness but also for genuine psychic functioning (Lawrence & Woodley, 1998; Parker, 2000a). The *Sense of Coherence Scale* (SCS), which is claimed to measure Comprehensibility, Manageability, and Meaningfulness (Antonovsky, 1987), has been used in 3 studies. The *SCS* could be said to be a positive measure since high scores on this scale is indicative of health.

Forced-Choice and Other Experimental ESP-Studies The measures used in 3 or more experimental ESP-studies other than ganzfeld are presented in Table 4. The complete list of measures is to be found in Appendix 2. 10 different research groups published the 28 studies, of which 25 were forced-choice studies. A total of 38 different questionnaires, tests, and sets of items have been used in these studies. Of these 12 (32%) were claimed to measure paranormal beliefs/experiences. Although belonging to a wide definition of paranormal beliefs, measures used to measure belief in an afterlife and religiosity could be (and were) included in this category.

Table 4. Measures used in 3 or more experimental ESP-studies other than ganzfeld.

Measure	Number of studies	Number of research groups
Australian Sheep-Goat Scale	3	3
Cattell's 16 Personality Factors	4	2
Defence Mechanism Test	11	2
Eysenck Personality Questionnaire	7	2
German Questionnaire on Attitudes Towards Extraordinary Themes	3	1
Icelandic Sheep-Goat Scale	9	1
NEO Personality Inventory	3	1
Paranormal Belief Scale	4	4
Participant Information Form	6	3
Questions on belief in an afterlife	8	1
Questions on dream recall	10	1
Questions on religiosity	4	1
Religiosity Scale	7	2

The *AS-GS*, the *Icelandic Sheep-Goat Scale* (IS-GS) Haraldsson & Houtkooper, 1992), the *PBS*, the *German Questionnaire on Attitudes Towards Extraordinary Themes* (GQATET) (Mischo, Boller & Braun, 1993), the *PIF*, the *Religiosity Scale* (RS) (Haraldsson, 1981), and the questions on belief in an afterlife and religiosity were the

major instruments used to measure paranormal beliefs/experiences in the forced-choice ESP-studies.

In Lawrence's (1993) meta-analysis of forced-choice ESP-studies the *AS-GS* was the only measure of the ones listed above which had been used. Lawrence commented on the fact that the *PBS* and the *BPS* had not been used in parapsychological research. The situation is still unchanged for the *BPS* but the *PBS* has been used in the later studies. On the other hand, the *Schmeidler Criterion 1 question*, the *ISQ*, and the *S-GQ* had all been used in Lawrence's meta-analysis but have not been used in the later studies.

The major instruments used to measure personality were the *C16PF*, the *EPQ*, and the *NEO-PI*. The *Defence Mechanism Test* (DMT) has been used in 11 studies, which tried to show correlations between low perceptual defensiveness and high scores on ESP tests. The ESP-DMT relationship was reported significant in a meta-analysis of 10 experiments (Haraldsson & Houtkooper, 1995) but a replication attempt failed (Parker, 1995).

Discussion

Studies of Paranormal Beliefs and Experiences

The studies on paranormal beliefs and experiences made use of 33 different questionnaires, tests, and sets of items to measure these beliefs and experiences. 4 different research groups have used the *AS-GS* in 24 studies whereas 16 different research groups have used the *PBS* in 21 studies. Although there has been severe criticism directed towards the *PBS*, (Lawrence, 1995; Lawrence & Roe, 1997) it is still the most widely used questionnaire to measure paranormal beliefs. As was noted earlier, the *PBS* is one of the measures of paranormal beliefs which falls outside the traditional domains of parapsychology since it includes not only items on ESP, PK, and life after death-questions but also questions concerning extraordinary life forms, superstition, and witchcraft. Irwin (1993) noted in his review of studies on paranormal beliefs that the research by sceptics of the paranormal often have had the objective of demonstrating that paranormal believers were "grossly deficient in intelligence, personality, education, and social standing" and that "this underlying motivation is evidenced most clearly in the sceptics' selection of variables to correlate with level of paranormal belief" (p. 6). In the current review, the majority of the studies on paranormal beliefs and experiences indeed appeared to have had the objective of correlating paranormal beliefs with various "negative" variables relating to deficiency and dysfunction. While it is not always possible to know the prior beliefs and biases of researchers, it is undoubtedly the case that the net bias of researchers has been towards finding "negative" correlates of paranormal beliefs and very few have looked for "positive" correlates. It also seems probable that the wide use of the *PBS*, which falls outside the domain of traditional parapsychology, will reinforce this bias.

Another concern that should be mentioned is the fact that the majority of studies in this review have used undergraduate psychology students as their subjects. This is of course a severe limitation on the generalizability of the results. Quite often paranormal believers are regarded as if they were individuals randomly selected from the general

population but in reality this is rarely if ever the case. The situation becomes further misleading when we consider the fact that there is also a difference between different types of research. *Surveys of paranormal beliefs* often involve people from the general population whereas *studies trying to correlate paranormal beliefs with other variables* often use psychology students. Even beliefs amongst psychology students are not consistent. In a study on paranormal beliefs, it was found that fourth-year senior students reported less overall belief in the paranormal compared to first-year college students (Fitzpatrick & Shook, 1994).

An example of how researchers' attitudes can steer research is found in a recent paper (Mehrabian et al., 1997) where it is claimed that scales that deal exclusively with *belief* in the possibility of paranormal phenomena are less likely to relate to various measures of psychopathology than scales that include actual paranormal *experiences*. This makes sense only if the argument is based on the notion that paranormal phenomena do not exist, i.e. they can be fully explained by the clinical, cognitive, or neurobiological approach.

The above black or white kind of categorical thinking as to paranormal phenomena may undermine the whole research effort. It could be argued that if paranormal phenomena exist then having *paranormal experiences* would *not have to be* a sign of pathology (although it of course still could be). The *Paranormal beliefs* caused by these experiences would also *not have to be* a sure sign of pathology. On the other hand, belief in paranormal phenomena without any substantial cause, that is, without the individual having had any paranormal experiences, *could be* a sign of pathology – or it could be merely a sign of reading the literature

Psi-Ability Research

Forced-Choice ESP-Studies: Most of the questionnaires measuring paranormal beliefs listed in the meta-analysis of forced-choice studies (Lawrence, 1993) have not been used in the more recent forced-choice studies. An exception is the *AS-GS*, which has been used in 3 studies by 3 different research groups. As we noted earlier the *PBS*, and the *PIF* have also been used relatively often in ESP-research.

Free-Response ESP-Studies: The free-response ESP (ganzfeld) studies in this review show a similar pattern as the forced-choice studies concerning the *PIF*, which has been used in 29 studies by 3 different research groups. The majority of researchers in this field use parts of the *PIF* to measure paranormal beliefs instead of other questionnaires. The only other major questionnaire measuring paranormal beliefs that has been used in these studies was the *AS-GS*. This scale has been used in 3 studies but by the same researcher. In contrast to the above noted use of the *PBS* in forced-choice ESP-studies this instrument has not been applied in free-response ESP-studies. This may well reflect the practice amongst researchers conducting ganzfeld experiments to recruit participants from a homogenous population of "sheep" who say they believe in paranormal phenomena. Unfortunately the absence of such measures means that we do not know the degree to which the results depend on paranormal beliefs.

The recent meta-analysis by Milton and Wiseman (1999) is a good example of what happens when these variables have not been measured or reported. It was impossible to compare this meta-analysis with the Bem and Honorton (1994) one regarding variables

like belief in psi and novice's psi experiences. Partly for this reason nothing conclusive can be said about the failure to replicate the Bem and Honorton results.

One lesson to be learned from this vast and unwieldy area of research is that it is of uttermost importance for researchers in this field to be clear about how their own standpoint influences the choice of measures they use and variables they try to correlate paranormal beliefs and experiences with. In the absence of this, there is a serious risk of presenting a biased research and with it a biased picture of paranormal believers.

A practical and an ethical consequence of this is the risk that individuals seeking clinicians for help with paranormal experiences will be fitted into a fictitious pathological category. In this respect it is interesting to note that psychotherapists with humanistic orientation were less inclined to classify their clients' subjective paranormal experiences as pathological than were therapists with psychodynamic and behavioural orientations (Allman, de la Rocha, Elkins & Weathers, 1992). Humanistic psychology can be regarded as the only branch of psychology, except for parapsychology, that acknowledges the validity of transpersonal/spiritual/paranormal experiences. Up to now paranormal beliefs and experiences have almost exclusively been psychometrically studied with respect to negative or pathological variables. Irrespective of our standpoint as to the genuineness of psychic experiences, it can be argued that since human experiences rarely, if ever, are solely negative or solely positive, it makes sense to try and capture the whole experience, not only a part of it. Measuring both positive and negative variables that are thought to relate to paranormal beliefs and experiences by using valid and reliable measures best does this.

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Appendix 1

The Complete List of Measures

ADUS - Alcohol and Drug Use Scales
 AEI - Anomalous Experiences Inventory
 APMT - Advanced Progressive Matrices Test
 AS-GS - Australian Sheep-Goat Scale
 AT - Ambiguity Tolerance
 AT 20+ - version of AT plus items from California Personality Inventory; Conformity Scale
 ATDS - Attitude Towards Death Scale
 BAQ - Belief in Astrology Questionnaire
 BEPS - Belief in Extraordinary Phenomena
 BPP - Belief in Psychical Phenomena
 BQ - Boundary Questionnaire
 BSRI - Bem Sex Role Inventory
 C 16 PF – Cattell's 16 Personality Factors
 CAST - Children of Alcoholics Screening Test
 CCT - Conceptual Creativity Test
 CCTT - Cornell Critical Thinking Test
 CEE - Checklist of Effects of Experiences
 CLB - Cognitive Laterality Battery
 cpa - classification of panic attacks
 CPSS - Complex Partial Epileptic Signs Scale
 CPS - Creative Personality Scale
 CS - Conceivability Scale
 DAS - Death Anxiety Scale
 DES - Dissociative Experiences Scale
 DMT - Defense Mechanism Test
 dq - demographic questions
 DRS - Dream Recall Scale
 DS - Dogmatism Scale
 DTAS - Depression and Trait Anxiety Scales
 EFT - Embedded Figures Test
 EPQ - Eysenck Personality Questionnaire
 EPS - Extrasensory Perception Survey
 ESPC/NCQ - ESP Chance/Non-Chance Questionnaire
 ESRS - "Experiential" Subscale of Religiosity Scale
 FIQ - False Identification Question
 GDS - Globality Differentiation Scale
 GI - Gregariousness Index
 GQATET - German Questionnaire on Attitudes Towards Extraordinary Themes
 GSCS – Garant's Self Confidence Scale
 HaS - Hallucination Scale
 HGSHS - Harvard Group Scale of Hypnotic Susceptibility
 HLSS - Healthy Life Style Scale
 HS - Hyperaesthesia Scale
 IAS - Identity Achievement Scale
 IBI - Irrational Beliefs Inventory
 ICHDS - I Ching Hexagram Descriptor Form
 ICMI - Inventory of Childhood Memories and Imaginings
 icpTCMI - items on creative personality and items from Torrance Creative Motivation Inventory
 ICRE - Index of Changes Resulting from Experiences
 id - items on dreams
 I-E LCS - Internal-External Locus of Control Scale
 IJS - Independence of Judgement Scale
 iml - items on meaning in life
 ir-pq - items on religio-philosophical questions
 ISA - Index of Self Actualization

PSYCHOMETRIC MEASURES

ISE - Index of Self Esteem
 IS-GS - Icelandic Sheep-Goat Scale
 ispe - items from survey of psychic experiences
 itpe - items on transcendent and psychic experiences
 JAS - Jenkins Activity Survey
 JWS - Just World Scale
 KS - Kinsey Scale
 LCS - Locus of Control Scale
 LEQ - Life Experiences Questionnaire
 LQ - Luckiness Questionnaire
 L/UQ - Lucky/Unlucky Questionnaire
 mac - mood adjective checklist
 MAT-50 - Measure of Ambiguity Tolerance
 MBTI - Myers-Briggs Type Indicator
 MDS - Manic Depressiveness Scale
 MEI - Mental Experience Inventory
 MES - Mystical Experience Scale
 MFFT - Matching Familiar Figures Test
 mhst - mental health screening test
 MIS - Magical Ideation Scale
 MMPI HS - MMPI Hypomania Scale
 MMPI SS - MMPI Schizophrenia Scale
 MPADTS - Mehrabian PAD Temperament Scales
 MRS - Multivalued Response Scale
 MS - Mysticism Scale
 NAAS - Need for Achievement/Affiliation Scale
 NEO-PI - Personality Inventory measuring Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness
 PaBS - Paranormal Belief Scale
 PaES - Paranormal Experiences Scale
 PAS - Perceptual Aberration Scale
 PBEQ - Paranormal Beliefs and Experiences Questionnaire
 PBQ - Paranormal Belief Questionnaire
 PBS - Paranormal Belief Scale
 PES - Psychic Experiences Scale
 PESPPQ - Predicted ESP Performance Questionnaire
 PIF - Participant Information Form
 P/NAS - Positive/Negative Affect Scale
 PNES - Pearson's Novelty Experience Scale
 PSI - Paranormal Short Inventory
 PSS - Panic and Somatization Scales
 qae - questions on anomalous experiences
 qai/a - questions on artistic interest/ability
 qai/ud - question on attempt to interpret/understand dreams
 qba - questions on belief in an afterlife
 qbp - questions on belief in precognition
 qbpp - questions on belief in psychic phenomena
 qcsre - questions on childhood sleep-related experiences
 qdr - questions on dream recall
 qdu - question on drug use
 QED - Questionnaire of Experiences of Dissociation
 QME - Questionnaire of Mental Experiences
 qmp - questions on meditation practice
 QPE - Questionnaire of Psychic Experiences
 qpe - questions on paranormal experiences
 qppe - questions on personal psi experiences
 qr - question on religiosity
 qsao - questions on self attributed openness
 RS - Religiosity Scale
 RSS - Repression Sensitization Scale

SAM - Self-Assessment Manikin
 SBA - Survey of Belief in an Afterlife
 SCS - Sense of Coherence Scale
 scq - subjective creativity questionnaire
 SDS - Social Desirability Scale
 sess - survey on experiences of second sight
 SGI - Sex Guilt Inventory
 S-G Q - Sheep-Goat Questionnaire
 s-gs - sheep-goat scale
 spb - survey on paranormal belief
 SPE - Subjective Psychic Experiences
 SPQ - Schizotypal Personality Questionnaire
 spt - survey on paranormal tro
 SQ - Solitaire Questionnaire
 sqerepr - set of questions exploring the respondent's experiences of psychic readings
 srh - self rated health
 SS - Superstitiousness Scale
 SSS - Sensation Seeking Scale
 STAI - State Trait Anxiety Inventory
 STAS - (STA Scale), Schizotypal Personality Scale
 STCE - Survey of Traumatic Childhood Experiences
 STrAS - Spielberger Trait Anxiety Scale
 TAS - Tellegen Absorption Scale
 TLS - Temporal Lobe Symptoms
 TS - Transliminality Scale
 TTCT - Torrance Tests of Creative Thinking
 UEQ - Unusual Experiences Questionnaire
 VCT - Visual Creativity Test
 VVIQ - Vividness of Visual Imagery Questionnaire
 WAIS - Wechsler Adult Intelligence Scale
 WCT - Wordstem Completion Task
 WGTCT - Watson Glaser Test of Critical Thinking
 WPAI - Wilson Patterson Attitude Inventory
 ÅEI - Ås Experience Inventory
 4 DPT - a personality instrument measuring Insensitivity, Extraversion, Neuroticism, Orderliness

Appendix 2

Measures Used in ESP Ganzfeld Studies

Measure	Number of studies	Number of research groups
Australian Sheep-Goat Scale	3	1
Cognitive Laterality Battery	1	1
Defence Mechanism Test	2	1
Dissociative Experiences Scale	1	1
Internal-External Locus of Control Scale	1	1
Magical Ideation Scale	4	2
Myers-Briggs Type Indicator	23	3
NEO Personality Inventory	12	3
Participant Information Form	29	3
Perceptual Aberration Scale	2	1
Questions on meditation practice	2	1
Questions on personal psi experiences	2	1
Sense of Coherence Scale	3	1
Sheep-Goat Scale	1	1
Subjective creativity questionnaire	1	1
Tellegen Absorption Scale	3	2
Torrance Tests of Creative Thinking	1	1
Transliminality Scale	2	1
Vividness of Visual Imagery Questionnaire	1	1
Wordstem Completion Task	1	1
4 DPT	2	1

Measures Used in ESP Experimental Studies Other Than Ganzfeld

Measure	Number of studies	Number of research groups
Australian Sheep-Goat Scale	3	3
Cattell's 16 Personality Factors	4	2
Defence Mechanism Test	11	2
Dream Recall Scale	1	1
ESP Chance/Non-Chance Questionnaire	1	1
"Experiential" Subscale of Religiosity Scale	1	1
Eysenck Personality Questionnaire	7	2
Garant's Self Confidence Scale	2	1
German Questionnaire on Attitudes Towards Extraordinary Themes	3	1
Hyperaesthesia Scale	1	1
Icelandic Sheep-Goat Scale	9	1
I Ching Hexagram Descriptor Form	1	1
Inventory of Childhood Memories and Imaginings	1	1
Luckiness Questionnaire	2	1
Lucky/Unlucky Questionnaire	1	1
mood adjective checklist	1	1
Myers-Briggs Type Indicator	1	1

NEO Personality Inventory	3	1
Paranormal Belief Scale	4	4
Participant Information Form	6	3
Predicted ESP Performance Questionnaire	1	1
Positive/Negative Affect Scale	1	1
questions on artistic interest/ability	1	1
questions on attempt to interpret/ understand dreams	1	1
questions on belief in an afterlife	8	1
questions on belief in precognition	1	1
questions on belief in psychic phenomena	2	1
questions on dream recall	10	1
questions on religiosity	4	1
questions on self attributed openness	1	1
Religiosity Scale	7	2
Self Assessment Manikin	1	1
Sensation Seeking Scale	2	2
Solitaire Questionnaire	2	1
Spielberger Trait Anxiety Scale	2	1
Subjective Psychic Experiences	1	1
Transliminality Scale	2	1
Visual Creativity Test	1	1

Measures Used in Studies on Paranormal Beliefs/Experiences

Measure	Number of studies	Number of research groups
Advanced Progressive Matrices Test	2	2
Alcohol and Drug Use Scales	1	1
Ambiguity Tolerance	1	1
Anomalous Experiences Inventory	5	3
AT 20+, version of AT plus items from California Personality Inventory and the Conformity Scale	1	1
Attitude Towards Death Scale	1	1
Australian Sheep-Goat Scale	24	4
Belief in Astrology Questionnaire	1	1
Belief in Extraordinary Phenomena	1	1
Belief in Psychical Phenomena	1	1
Bem Sex Role Inventory	1	1
Boundary Questionnaire	1	1
Cattell's 16 Personality Factors	4	1
Checklist of Effects of Experiences	1	1
Children of Alcoholics Screening Test	1	1
classification of panic attacks	1	1
Complex Partial Epileptic Signs Scale	1	1
Conceivability Scale	1	1
Conceptual Creativity Test	1	1
Cornell Critical Thinking Test	2	1
Creative Personality Scale	5	1
Death Anxiety Scale	2	1
demographic questions *	7	6
Depression and Trait Anxiety Scales	1	1
Dissociative Experiences Scale	6	5

PSYCHOMETRIC MEASURES

Dogmatism Scale	1	1
Dream Recall Scale	1	1
Embedded Figures Test	1	1
Extrasensory Perception Survey	1	1
Eysenck Personality Questionnaire	5	3
False Identification Question	1	1
Globality Differentiation Scale	4	1
Gregariousness Index	1	1
Hallucination Scale	1	1
Harvard Group Scale of Hypnotic Susceptibility	1	1
Healthy Life Style Scale	1	1
Hyperaesthesia Scale	2	1
Icelandic Sheep-Goat Scale	1	1
Identity Achievement Scale	1	1
Independence of Judgement Scale	1	1
Index of Changes Resulting from Experiences	1	1
Index of Self Actualization	1	1
Index of Self Esteem	1	1
Internal-External Locus of Control Scale	2	2
Inventory of Childhood Memories and Imaginings	4	3
Irrational Beliefs Inventory	1	1
items on creative personality and items from Torrance Creative Motivation Inventory	1	1
items from survey of psychic experiences	1	1
items on dreams	1	1
items on meaning in life	1	1
items on religio-philosophical questions	1	1
items on transcendent and psychic experiences	1	1
Jenkins Activity Survey	1	1
Just World Scale	1	1
Kinsey Scale	1	1
Life Experiences Questionnaire	1	1
Locus of Control Scale	1	1
Magical Ideation Scale	13	4
Manic Depressiveness Scale	7	1
Matching Familiar Figures Test	1	1
Measure of Ambiguity Tolerance	1	1
Mehrabian PAD Temperament Scales	3	1
Mental Experience Inventory	1	1
mental health screening test	1	1
MMPI Hypomania Scale	1	1
MMPI Schizophrenia Scale	1	1
Multivalued Response Scale	1	1
Mystical Experience Scale	7	1
Mysticism Scale	3	1
Need for Achievement/Affiliation Scale	1	1
Panic and Somatization Scales	1	1
Paranormal Belief Questionnaire	1	1
Paranormal Belief Scale (PaBS)	1	1
Paranormal Belief Scale (PBS)	21	16
Paranormal Beliefs and Experiences Questionnaire	1	1
Paranormal Experiences Scale	1	1
Paranormal Short Inventory	1	1
Pearson's Novelty Experience Scale	1	1

Perceptual Aberration Scale	1	1
Positive/Negative Affect Scale	1	1
Psychic Experiences Scale	2	2
Questionnaire of Experiences of Dissociation	3	2
Questionnaire of Mental Experiences	2	1
Questionnaire of Psychic Experiences	3	1
questions on anomalous experiences	1	1
questions on childhood sleep-related experiences	1	1
questions on drug use	1	1
questions on paranormal experiences	1	1
Religiosity Scale	1	1
Repression Sensitization Scale	1	1
Schizotypal Personality Questionnaire	1	1
Schizotypal Personality Scale	2	2
self rated health	1	1
Sensation Seeking Scale	3	2
set of questions exploring the respondent's experiences of psychic readings	1	1
Sex Guilt Inventory	1	1
Sheep-Goat Questionnaire	1	1
Social Desirability Scale	3	3
State Trait Anxiety Inventory	1	1
Superstitiousness Scale	1	1
Survey of Belief in an Afterlife	3	1
Survey of Traumatic Childhood Experiences	1	1
survey on experiences of second sight	1	1
survey on paranormal belief	1	1
survey on paranormal tro	1	1
Tellegen Absorption Scale	6	4
Temporal Lobe Symptoms	1	1
Torrance Tests of Creative Thinking	1	1
Transliminality Scale	5	1
Unusual Experiences Questionnaire	1	1
Vividness of Visual Imagery Questionnaire	1	1
Watson Glaser Test of Critical Thinking	1	1
Wechsler Adult Intelligence Scale	1	1
Wilson Patterson Attitude Inventory	2	1
Ås Experience Inventory	1	1

* demographic questions is not one set of items, different researchers have used different questions

Age and Sex Differences in Paranormal Beliefs after Controlling for Differential Item Functioning

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Abstract: Previous studies have reported age and sex differences in the strength of paranormal beliefs, but these findings could have been an artefact of differential item functioning (items that can be understood differently by certain groups such as women or men, or different age groups) in the scales used to index paranormal beliefs. Using a paranormal belief questionnaire that has been shown to be free of differential item functioning for sex and age, a cumulative sample of 563 Australian adults confirmed the general trend for paranormal beliefs to decline with age and to be higher among women than men. A hypothesised interaction between sex and age was not supported. Empirical and theoretical implications of these findings are addressed.

There is no universally endorsed definition of paranormal belief but under one relatively broad conceptualisation (Tobacyk & Milford, 1983) this domain has been posited to encompass beliefs in traditional religious concepts, psi (extrasensory perception and psychokinesis), precognition (astrology), witchcraft, superstition, spiritualism, and extraordinary life forms (e.g., the Loch Ness monster). A substantial body of research suggests that most facets of paranormal belief are slightly more strongly endorsed by women than by men, and that paranormal beliefs generally decline slightly with age (for a detailed review of this literature see Irwin, 1993). Further, one recent study by Vitulli, Tipton, and Rowe (1999) reported an interaction between sex and age, with the highest levels of global paranormal belief found in young men and elderly women.

The previous research nevertheless has relied on measures of paranormal belief that either are known to be marred by **differential item functioning** for sex and age, or have not been shown to be free of such a flaw. Differential item functioning is a bias in the way in which questionnaire items actually function. Thus, the *meaning* of an item may differ between men and women or between young and old people, for example (Thissen, Steinberg, & Gerrard, 1986). This phenomenon has serious ramifications for measurement because it violates the assumption of local independence under which items' *measurement properties* should not be affected by extraneous factors such as age and sex.

Recent research by Lange, Irwin, and Houran (2000) has demonstrated the presence of differential item functioning for sex and age in the most widely used research measure of paranormal belief, Tobacyk's (1988) *Revised Paranormal Belief Scale*. Other paranormal belief questionnaires have not been shown to be immune to this measurement problem. Unless the items of a questionnaire are known to be free of differential item functioning, observed age and sex differences in paranormal belief scores might potentially be due to an artefactual measurement bias in the test items rather than to any discriminative relationship with the facet of paranormal belief supposedly indexed by the test.

This study used indices of paranormal belief that are not contaminated by differential item functioning. In light of previous research, it was hypothesised that paranormal beliefs exhibit sex, age, and sex-by-age interactions effects.

Method

Participants

The author has solicited data on the *Revised Paranormal Belief Scale* (Tobacyk, 1988) over the past ten years for a series of published and unpublished studies on paranormal belief, and all usable data were combined for the present purposes. The aggregate sample comprised 563 Australian adults (430 women and 133 men), including a substantial minority of university students. Participants' age ranged from 17 to 72 years ($M = 31.5$, $SD = 10.8$, $Median = 32$).

Materials

Participants completed the 26-item Revised Paranormal Belief Scale (RPBS; Tobacyk, 1988) and a short demographic questionnaire that included items on age and sex; various other questionnaire measures were included in the survey inventories, depending on the aim of the respective study.

The full 26-item RPBS (Tobacyk, 1988) was administered, but items found by Lange et al. (2000) to exhibit differential item functioning were not scored; most of the excluded items relate to superstitions (e.g., "the number 13 is unlucky") or extraordinary life forms (e.g., the Loch Ness monster). Through a process of "top-down purification" followed by factor analysis Lange et al. identified two facets of paranormal belief that are indexed free of differential item functioning by selected items of the RPBS. These scales are labelled New Age Philosophy (NAP) and Traditional Paranormal Beliefs (TPB). The NAP scale comprises 11 items relating to belief in psi abilities, reincarnation, altered states, and astrology; the TPB scale has 5 items on belief in traditional paranormal concepts such as the devil, hell, and witchcraft. Responses to the RPBS are made on a 7-point Likert scale (1 = strongly disagree, to 7 = strongly agree), but for the purpose of this study they were recoded under a Rasch scaling procedure (Andrich, 1988) specified by Lange et al. (2000). Thus, NAP scores potentially may range from 6.85 to 47.72, and TPB scores may range from 11.16 to 43.24.

Procedure

Potential participants were approached individually or in class groups. A "plain language" statement was attached to the front of the inventory. This statement described the topic of the study, stressed that participation was voluntary and anonymous, and explained that the return of the completed form would in itself be taken to signify the respondents' informed consent to participate in the project. Additionally, an appeal was made to participants to respond to all questionnaire items as spontaneously and openly as possible. Participants returned their completed forms either in person or in a stamped envelope supplied by the researcher.

Results

Descriptive statistics for the total sample on the NAP were $\underline{M} = 24.94$, $\underline{SD} = 5.20$; those for the TPB were $\underline{M} = 24.89$, $\underline{SD} = 4.97$.

To assess sex, age, and sex-age interaction effects in paranormal belief, a multivariate analysis of variance was undertaken with NAP and TPB as dependent variables and both sex and age group as factors. For this analysis age was divided approximately into four decade subgroups, namely, teens, twenties, thirties, and forties or over. Descriptive statistics for each cell are given in Table 1.

Table 1. Means and standard deviations of NAP and TPB scores by sex and age group

		Women				Men			
		Teens	Twenties	Thirties	Forties	Teens	Twenties	Thirties	Forties
NAP	\underline{M}	25.45	26.66	24.65	24.49	24.73	24.20	23.21	23.08
	\underline{SD}	4.86	4.93	5.19	5.62	5.25	5.42	3.37	5.83
TPB	\underline{M}	26.18	25.74	24.78	24.20	26.04	23.96	24.90	22.12
	\underline{SD}	4.67	4.69	4.80	5.09	6.18	4.88	4.20	5.72
	\underline{n}	88	116	121	105	22	40	41	30

Significant multivariate effects were observed for sex (Wilks' lambda = .98, $\underline{F}_{2,554} = 4.51$, $p = .011$) and age group (Wilks' lambda = .96, $\underline{F}_{6,1108} = 3.57$, $p = .002$), but not for the interaction (Wilks' lambda = .99, $\underline{F}_{6,1108} = 4.51$, $p = .732$). Univariate tests for the effect of sex showed significant differences between women and men on both the NAP ($\underline{F}_{1,555} = 8.38$, $p = .004$) and the TPB ($\underline{F}_{1,555} = 5.54$, $p = .019$). Univariate tests for the effect of age group also yielded significant results: NAP $\underline{F}_{3,555} = 2.74$, $p = .043$; TPB $\underline{F}_{3,555} = 5.08$, $p = .002$. Post hoc LSD comparisons of means indicated that the NAP mean was higher for people in their twenties than for those in their thirties and for those who are forty or older; for TPB, the mean for teenagers was higher than those for both the thirties group and the forties group, and participants in their twenties generally scored more highly than the forties group.

Some readers may be uncomfortable with the recoding of the continuum of age into a categorical variable. In this light it may be appropriate to add that both paranormal belief scales correlated significantly with age as a dimensional variable (NAP: Pearson $r_{561} = -.14$, $p < .005$; TPB: $r_{561} = -.17$, $p < .001$).

Discussion

Although the measures of paranormal belief used in the present analysis had the advantage of being no longer confounded by the effects of differential item functioning, the results of the analysis confirmed the trends of previous research. This was that women typically endorse most facets of paranormal belief slightly more strongly than do men, and that the strength of paranormal beliefs marginally declines with age.

These findings still leave some uncertainty over occasional reports that some facets of paranormal belief are more marked in men than women. Belief in extraordinary life forms such as the Loch Ness monster has been reported to be slightly stronger among men (e.g., Tobacyk & Milford, 1983), but the items measuring this belief are known to be characterised by differential item functioning (Lange et al., 2000). Men have also been said to have greater belief in UFOs (e.g., Gray, 1990b), but the questionnaire used in these studies not only has yet to be shown to be free of differential item functioning, but also has had no psychometric assessment of any kind. The latter criticisms also apply to some rare anomalous observations of higher global paranormal belief in men than in women (e.g., Vitulli & Luper, 1998). This is not to claim that women typically embrace *all* paranormal beliefs more strongly than do men, but merely to observe that men's stronger endorsement of any facet of paranormal belief has yet to be demonstrated in a psychometrically satisfactory manner.

The lack of evidence for a sex-age interaction effect fails to support the observation by Vitulli et al. (1999). Further investigation of such an interaction effect is warranted, especially in light of the fact that Vitulli et al. sampled elderly people aged 46 to 94 whereas the present study included relatively few people over the age of 50. It is possible, therefore, that the high paranormal belief said by Vitulli et al. to be exhibited by older women will be evident only if researchers take specific steps to canvass very elderly people. On the other hand, Vitulli et al.'s report of high paranormal belief in young men was not confirmed by the present analysis. Perhaps the observation of a sex-age interaction effect by Vitulli et al. is largely an artefact of their reliance on a psychometrically unattested measure that has not been evaluated for differential item functioning. Future research should serve to clarify this issue.

Brief reference may be made to theoretical implications of the findings. It must be stressed that such implications should not be overestimated, given that the observed effect sizes are small. In this regard the data nevertheless provide contradictory indications for the social marginality hypothesis of paranormal belief. Several sociological commentators (e.g., Bainbridge, 1978; Wuthnow, 1976) propose that the people most susceptible to paranormal belief are members of socially marginal groups, that is, groups such as the poorly educated or the unemployed that possess characteristics or roles that rank low among dominant social values. To the extent that women and the aged continue to be socially marginalised in society the social marginality hypothesis predicts that paranormal belief is positively related to the feminine gender role and to agedness. The study's findings are consistent with the social marginality hypothesis in the case of sex but are contrary in regard to age. The functions of paranormal belief evidently are rather more complex than envisaged by the social marginality hypothesis. Indeed, as observed by an anonymous referee for

this paper, the fact that a majority of the population embraces paranormal beliefs (Sobal & Emmons, 1982) casts doubt on the social marginality hypothesis as a comprehensive account of paranormal belief; since it seems unreasonable to imply that a majority of people are socially marginal.

In conclusion, the findings reported here are encouraging for the view that the substantial body of empirical literature on paranormal belief might not be hopelessly confounded by the measurement problem of differential item functioning. At the same time, further such studies are called for in order to assess the generality of this view.

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Research Note:

Effect Size in the Transliminal Connection between Paranormal Effects and Personality in an Experiment with the *I Ching*' by Storm & Thalbourne (1998-1999)⁸

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Storm and Thalbourne (1998-1999) examined the success rate on an ESP test that made somewhat unorthodox use of the Chinese book of divination, the *I Ching*. The *I Ching* consists of 64 unique hexagrams (six-line structures), each with its own reading, which are accessed by six throws of three coins. From a field of 64 hexagram-labels, subjects were asked to pre-specify, or designate, 16 hexagram-labels thought to be relevant to the statement, "Lately, or right now, I feel . . ."

We expected that one of these 16 choices would come up as a result of the coin tosses, where there was a one in four chance of achieving a "hit" ($P_{MCE} = .25$). We predicted that there would be a "significant achievement of a designated hexagram outcome" (Storm & Thalbourne, 1998-1999, p. 104). In the Results section we interpreted the $p = .067$ value (obtained using the Binomial test) as "marginally significant" (p. 109), and in the Discussion we did not claim that the hypothesis had been significantly confirmed (p. 115).

In the light of a suggested move away from strict adherence to significance testing of hypotheses, and towards the "success of replication" paradigm, based on effect size (Rosenthal, 1986, p. 320), we subjected our data to an exploratory analysis. Our 'hitting rate' of $P = .323$ and the effect size finding of $\pi = .589$, using Rosenthal and Rubin's (1989, p. 333) formula $\pi = P(k - 1)/[1 + P(k - 2)]$, were each used in Rosenthal and Rubin's (1989, p. 334) formula (4) to calculate a Z statistic:

$$Z = \frac{N^{1/2} (\pi - .50)}{\pi(1 - \pi)/[P(1 - P)]^{1/2}},$$

where $N = 93$ subjects tested, which justifies using this large-samples formula (Siegel, 1956). $Z = 1.66$ ($p = .0485$, one-tailed) so that the effect size was significantly above the MCE effect size of .50. ($P_{MCE} = .50$ because π is the "proportion correct, transformed to a two-choice standard situation" [Rosenthal & Rubin, 1989, p. 333].) Thus, as far as effect size is concerned, the hypothesis was confirmed. (For a similar test of effect size significance, see Lawrence, 1994.)

The question then arises: "Of what type of experiment is the *I Ching* experiment a replication?" One might debate the issue over whether or not our task was, for most subjects, a blind PK type (since the coins were 'influenced' in order to generate the designated hexagram) or a precognition task (knowing in advance and

⁸ The preparation of this research note was supported by a grant from the Bial Foundation.

then choosing the outcome hexagram from 16 *most probable* hexagrams of 64). In terms of matching effect sizes, the effect size found here (.59) does not compare to the relatively low ones usually found in RNG, dice throwing, and precognition experiments. Only the ganzfeld experiments show similar effect sizes (.62), but obviously involve a different research method (Bem & Honorton, 1994, p. 8). Further research using this technique is clearly warranted, and is in progress (Storm & Thalbourne, 2000).

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Book Review: The PK Man

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The PK Man. by Jeffrey Mishlove, 2000. Hampton Roads Charlottesville, Virginia. Price:14.95\$ ISBN:1-57174-183-6

During the seventies and eighties a man by the name of Ted Owens was something of a cult figure, especially within American UFO-circles. Despite this – or perhaps because of this, there were not many serious researchers who showed any interest in examining the beyond belief feats seemingly created by this man. Jeffrey Mishlove was one of the very few. (In his younger days Owens spent some time as a research subject at J.B. Rhine's institute at the Duke University in Durham, but his achievements wasn't very impressive and he was hardly considered a Psi star). Later in life Mr. Owens showed that he possessed powers way beyond any of J.B. Rhine's cardguessing stars. On numerous occasions he claimed to have affected or predicted weather conditions in such a way that it stunned even the most fanatic PSI-believer. I say claimed to have affected or predicted because it remains a bit unclear whether he actually affected the atmospheric happenings by his will as he said he did, or as most people seem to believe, predicted unusual weather changes by precognition. For instance, according to Mishlove, Owens made several thunderstorms appear during his lifetime. Some of them ended severe draughts while others simply caused destruction.

On some occasions his weather affecting feats was documented in the daily press with striking resemblance to "predictions" written down by Owens several weeks before. The Weather Service was apparently often stunned by the unpredicted weather changes Owens claimed to have created.

Weather changes were not the solitary phenomenon created by Owens. Everything from mass hypnosis to UFO manifestations was said to be within "The PK-man's" repertoire. As you might expect, these two phenomena become mentioned in the same sentence, is no mere coincidence. In his youth Owens was well known for his ability of inducing mass hypnosis among his friends. Later in life he made UFOs appear in front of people by request. Interestingly, there seems to be a connection even though some of his UFO visualisations appeared on photos taken by the spectators. The UFOs were according to Owens, visitors from the Space intelligences. It was to these Space Intelligences that Owens rightly or wrongly attributed the real source of the remarkable weather changes that he seemed to cause. Yet his own explanations of how he was able to affect Nature like he did, became sometimes a bit contradictory. One day he may claimed that he could create these happenings all by himself even though he said that the Space intelligences were causing them the day before.

⁹ The reviewer is a graduate student of psychology and a member of the Swedish Magic Circle

But it was not only weather conditions that Owens claimed to be able to affect. The book also describes a couple of examples where Owens apparently made predictions concerning truly important events, like the Challenger disaster and the Watergate scandal.

Dr Mishlove had the opportunity of working with Mr Owens from 1977 to the "miracle man's" death in 1997. In my opinion he has done some excellent research when it comes to the documentation of Owens life. His style of writing makes the book really easy to follow so that both researchers and laymen should find something in the book easy that is of interest.

It is easy to see how much Ted Owens came to fascinate Jeffrey Mishlove. Jeffrey's life became apparently affected in a rather profound way on getting to know the PK-man. (Owens gave Dr. Mishlove advice when it comes to career movements. He thinks it unlikely that he got his media-breakthrough by working as a host for the American Television Program "Thinking Allowed" without the influence of Owens). No doubt it can be said that this makes him a less objective researcher but the impressive reference list makes the book an objective work. However in terms of refuting alternative, "normal" explanations, what I am miss most of all is a thorough discussion of the possible role of selective memory. We need to assess whether or not making Owens quite simply made a lot of incorrect predictions that were unconsciously forgotten by Mishlove and other people. Other key questions concern subliminal cues and opportunism: Could Owens have had a form of hypersensitivity to weather conditions in for example knowing by when a thunder and lightening storm was likely to occur? Did he quite simply wait for unusual events to occur in his life (such as a plane crash) and then in an opportunistic way, make claims of being responsible for them? *Having said that I have to admit that would probably be at least as stunned, as Dr Mishlove wa, if somebody made lightning appear wherever I wanted and in a clear sky.*

The author also discusses the nature of these extraordinary powers. He speculates about the role of subpersonalities and about how everybody may have Owens' abilities to some extent. None of these theories are really new but they do fit the structure of the book in an excellent way. Naturally, it is hard to believe that all the extraordinary events described in the book. but even if just a small part of them were true and were created by Owens, he was a remarkable human being indeed. We can only hope that the next Ted Owens, if and when he arrives, won't be ignored by the scientific community like this one was.

Book Review: An Introduction to Parapsychology

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An Introduction to Parapsychology, by Harvey Irwin, third edition. 1999.
Jefferson, NC: McFarland. ISBN: 0-7864-0671-2

This excellent book is indeed an introduction to parapsychology but it is also more than that. *An Introduction to Parapsychology* starts off with the origins of parapsychological research and takes its readers through different research areas explaining existing theories and ends with an evaluation of parapsychology as a scientific enterprise. It is a book, which could be read by anybody as an introduction to parapsychology but it could also be used as course literature. Because the potential readership is both students and researchers, we decided to make this a joint review.

An Introduction to Parapsychology is written in a pedagogical way and each chapter has its own key terms and study questions. While the book makes a very comprehensive coverage of parapsychology it does not make the mistake of including anything, which could be loosely termed "paranormal". Instead the focus is keep on the subjects, which most parapsychologists would call paranormal. These subjects are ESP, PK, and the survival hypothesis.

The first introductory chapter deals with the definition of parapsychology and states the objective of the book, which is to "provide an introductory survey of parapsychologists' efforts to explore the authenticity and bases of these anomalous, apparently paranormal phenomena" (p.1). Irwin comes over as having a neutral attitude to the subject. He, for example, points out that ESP in future might be shown to be a delusory or hallucinatory experience rather than a paranormal one. On page 5 Irwin says why he thinks that most parapsychologists do not tend to interpret phenomena like witchcraft and popular astrology as legitimate issues in their field of research, which is a demarcation much needed in an introduction and which many sceptics would do well to observe.

While there are many helpful illustrations of different paranormal experiences in the book, the example chosen to illustrate telepathy, however, seems to be a weak one. "On a few occasions I have been thinking about some friend and have had my thoughts interrupted by a phone call from that very person"(p. 6). We suspect most parapsychologists would see the above as an example of selective memory.

Chapter two is concerned with the historical origins of parapsychological research. It takes its readers through the periods of mesmerism and spiritualism and gives a more detailed description of four spiritualistic mediums' lives. This leads naturally on to chapter three, which is about the phenomenology of extrasensory perception. This is a chapter we think many of today's parapsychologists should read because it somehow takes one back to the starting-point, that of people's experiences. Case studies of

spontaneous experiences are discussed in this chapter together with specific research problems, which may arise with this kind of material. Irwin mentions that the experience's emotional impact is an important although neglected aspect in ESP phenomenology and talks about a study he himself conducted. Maybe it would have been more poignant to mention some of the research concerning ESP phenomenology conducted on another type of experience, namely the Near-Death-Experience.

In chapter four the attention is turned to experimental research on extrasensory perception. This is a long chapter, which gives us an historical journey beginning in 1883 and ending more or less today. Irwin talks about the authenticity issue, process-oriented research, and the different variables, which may be important to ESP performance. One such variable is the experimenter effect. An appropriate current study to include in this section is the joint remote staring study conducted by Wiseman and Schlitz (1997). Although there is nothing new in the remote staring study, it does illustrate the classic features of the experimenter effect; Schlitz, who is a psi proponent obtained a positive result in this study whereas Wiseman, who is a sceptic regarding claims of parapsychology failed to find any significant effects. Another variable, which might be important to ESP performance, is the target. This is briefly mentioned in the book but without references being given. This is unfortunate since there are some very good papers on this subject, which could have been mentioned. They have all been published in Parapsychological Association's Proceedings rather than in journals, which means they have lower "status" but they are nonetheless informative. One paper by Watt and one by Delanoy from 1988 deal with the characteristics of successful free-response targets. Another paper from the same year by Morris is about the concept of the target, a paper by Delanoy from 1989 deals with the target definition, and a paper from 1996 by Delanoy and Solfvin explores psychological variables of free-response ESP targets and their relationship to psi-scoring. Amongst the subject variables in ESP performance, creativity is mentioned very briefly and Irwin states that: "A few studies have sought to compare ESP scores across groups high and low in creativity, but no clear evidence of a relationship between these variables has emerged" (p.104). This might be true but in this section we miss the results of the Dalton-study which was published in the Parapsychological Association Proceedings in 1997, which yielded stronger results with a creative population in work using free response material.

Chapter four also includes a discussion about the criticism that has been put forward regarding experimental procedures. This is a very instructive chapter for all readers. Many of these points of criticism should be as important to consider in ordinary psychological research as in parapsychological research. Parapsychologists may have something to teach other researchers and it is excellent that this aspect of research has been given sufficient weight in a book that is written as an introduction to parapsychology. There are also plenty of recommended sources for readers who want more information on the subject.

Chapter five deals with extrasensory perception and time. This issue is of importance since many psychologists reject the notion of ESP because if ESP exists then it is at odds with known scientific principles. However, it might have been appropriate to incorporate this brief chapter in chapter eight, which deals with theories of psi. In chapters six and seven we learn about psychokinesis. A special topic in PK

research is that of psychic healing. Irwin says that: "As long as human patients are employed in the study it becomes difficult to rule out alternative explanations of any observed alleviation of illness" (p. 153). To overcome this problem one could conduct research on animals instead. However, one could also use distant healing and of course appropriate double-blind procedures instead. For this reason it would have been interesting to also include DMILS-studies in this chapter. Quite a few such studies showing intriguing results have to date been reported, but there are current difficulties in replication. The chapter continues with information on psychic photography, which is a phenomenon that many parapsychologists do consider with unease, maybe because "fraudulent production of effects upon film is such a simple matter" (p. 155). The problem is that even if, for example, a clever illusionist does not know how an effect could have been produced, there is nothing to say that he or she has not been fooled by someone cleverer.

Chapter eight is a very lucid chapter on the theories of psi. Although some of these theories are very difficult to grasp, Irwin has been effective in making them relatively easy to understand. In the part on sceptical theories of psi phenomena one explanation for positive results, which is mentioned is non-randomness. Non-randomness is mainly mentioned in respect to forced-choice studies but is also a potential problem in free-response studies. One major difference between the various theories seems to be that the sceptical theories state that psi does not exist and therefore has to have normal explanations whereas the other theories state that psi exists and tries to explain how this could be possible. As far as we are concerned, a theory, which states that psi does not exist, cannot be a theory of psi. It is rather a theory of the illusion of psi. Irwin rightly points out that the sceptical theory is not so much a theory as an ideological stance. The sceptical theories mentioned here involve cognitive errors to a great extent. Another approach linked to cognition is what could be called the clinical one where psi experiences are seen as hallucinations or delusions.

Chapter nine is devoted to the third classical domain of parapsychological research, the survival hypothesis. This is followed by a chapter on poltergeist experiences. However, since poltergeist phenomena are mainly explained by PK then from an organisational point of view one might have expected the poltergeist chapter to belong to the PK chapters rather than the survival chapters. Chapter eleven deals with near-death experiences and twelve with out-of-body experiences. They clearly belong together with the survival hypothesis and so do chapters thirteen and fourteen, which deal with apparitional experiences and reincarnation experiences respectively.

Chapter fifteen is concerned with belief in the paranormal. Irwin explains what the consequences have been of the fact that most investigations of paranormal *belief* have been undertaken by scientists who themselves are not parapsychologists. He describes four theoretical approaches to the issue. They are: the social marginality hypothesis, the worldview hypothesis, the cognitive deficit hypothesis, and the psychodynamic function hypothesis. None of these hypotheses show any recognition of the fact that psi might exist, and, that some people therefore have genuine paranormal experiences.

Parapsychological research as being relevant for clinical psychology is the topic for chapter sixteen. One such matter is parapsychology and clinical practice. Many people reporting paranormal experiences seek clinicians in order to get help with their experiences, although it is doubtful if many of the clinicians have any knowledge or

experience in this area. A study, which is of interest regarding this, is an investigation into different clinical psychologists' views of the paranormal (Allman, de la Rocha, Elkins & Weathers, 1992). It was found that psychodynamic and behavioural therapists attributed significantly more pathology to clients reporting mystical experiences than did humanistic or existential therapists. Somehow one wonders if people will be helped of counselling by clinicians who do not even consider the possibility of the existence of psi. The fact that one of the diagnostic criteria for schizotypal personality disorder is "odd beliefs and magical thinking ... (e.g., superstitiousness, belief in clairvoyance, telepathy, or 'sixth sense'" (p. 645) according to DSM-IV tells us something about the general clinical attitude towards psi. Clearly, when surveys suggest that the majority of even educated people accept psi as real or probable then there must be something wrong with this attitude. Of course, psi-experiences might be negative for some people who have difficulties dealing with them. Earlier on in this book Irwin mentions that: "It is unnecessary, for example, to define extrasensory experience in a way that will distinguish it from delusory or hallucinatory experience" (p. 4). However, it might be necessary from the experiencers' point of view. Some people have paranormal experiences, which they find positive, which give their lives a greater meaning and which make them happier than they would be without their experiences. On the other hand, some people have experiences, which they find negative and disturbing, which they cannot control and which make their lives miserable. In a study from 1991 by Williams and Irwin it is clear that there seems to be important differences between paranormal believers and schizotypes, not so much when it comes to belief in the paranormal but rather in cognitive style. In this study, believers expressed a cognitive style based on notions of personal responsibility whereas schizotypes emphasised the role of randomness. In terms of the schizotypy measures used in the study, it was clear that the paranormal believers were not especially prone to schizophrenia. Of course this result will be received positively by paranormal believers who do not have problems with their experiences. A common fear is that clinicians would judge them as being disturbed or even insane if they talk about such experiences. Regrettably, this may be true.

The last chapter of this book is an evaluation of parapsychology as a scientific enterprise. Two general issues are considered. The first one concerns the efforts of parapsychologists to establish their discipline as a legitimate science; the second issue is the nature of the scientific establishment's responses to these efforts. We would like to emphasise again that this is an excellent book, which deserves to have a place in university- and public libraries. It is well written, comprehensive, and therefore well worth reading for both professionals and beginners with an interest in parapsychology.

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