RESEARCH LETTER

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The Research Letter is sent free to subscribers to the European Journal of Parapsychology and to members of the Parapsychological Association.

THE EFFECT OF VARIATIONS IN TARGET MATERIAL ON ESP AND MEMORY

S.J. Blackmore

If we are to integrate ESP into psychology and to learn more about its relationship to other processes one of the first questions to ask is whether ESP resembles cognitive processes such as memory and perception. I have discussed five methods used for investigating this which are 1. The study of errors made in ESP (Blackmore, 1981), 2. Correlations between ESP and memory or other cognitive skills (Blackmore, 1980a), 3. Studies of the effects of varying target material on ESP, 4. The use of the recall situation as a psi-conducive state and 5. The study of associative habits and their effect on ESP (Blackmore, 1980b). This paper is concerned only with the third of these approaches, that is studies of the effects of varying target material on ESP performance.

When considering other cognitive processes, the nature of the material used affects the outcome. The attributes of stimulus material affecting memory under different test conditions have been studied in some detail (see e.g. Herriot, 1974; Brown, 1976). Some words or pictures are easier to recall than others, others easier to recognise. The same can be said of perception. Under imperfect conditions, certain material is easier to perceive or to identify. The threshold for hearing one's own name is lower than for other names, the quality, clarity and familiarity of a stimulus affects the ease with which it is perceived in a brief exposure. Again the stimulus variables involved have been thoroughly studied (see Haber and Hershenson, 1973). If ESP involves the same processes as either memory or perception then we should expect variations in certain stimulus

attributes to affect the level of scoring. The attributes concerned may not be the same as for more familiar test paradigms but it would be reasonable to start by testing these before proceeding to new ones.

There is a certain amount of evidence relating to stimulus attributes and ESP. In general, early studies, such as those by Rhine (1937), showed little effect of varying obvious target variables such as size or distance (see e.g. Rhine and Pratt, 1954; Rhine, 1977). MacFarland and George (1937) and Murphy (1938) found no reduction in scoring when symbols were distorted and Rhine (1934) noted the simple point that the angle of presentation of the deck of cards is not important as one might expect on a 'radiation' theory. Van Busschbach (1956) found that colours were more effective targets than either arithmetic symbols or words, but he failed to control for the order of the different targets and in a later study (1961) found no effect. Van de Castle (1953) found that colours and ESP cards made better targets than numbers, letters or drawings, but he used only one subject and under poorly controlled conditions. The reason for the apparent effectiveness of ESP cards has been attributed to their relative freedom from the effects of guessing habits. All this evidence appears inconclusive at best, but if anything indicates no effect of varying the stimulus attributes tested.

Apart from these considerations little systematic study of stimulus variables has been carried out, other than incidentally. Perhaps this is because they are generally thought to be unimportant. Certainly it is not the practice in parapsychology for authors to report in any detail the nature of the stimulus. For example, when ESP symbols are used they may be bold black figures printed on white cards, small symbols typed in lists, or faint symbols from a computer's repertoire. They may be on individual cards, or on lists flat or folded. Such details are rarely thought to warrant inclusion in the experimental report.

These particular variables may indeed be unimportant, but if ESP resembles other cognitive processes, some attributes of the stimulus ought to affect it and the various theories of ESP may give clues to those attributes. Not all theories, though, make such predictions. Some, such as the observational theories or Stanford's conformance model (Stanford, 1978), do not make specific predictions about the type of target material most effective and they may be compatible with many findings. I shall consider here only those theories which relate ESP to other cognitive processes and so have implications for the

effects of different types of target.

Firstly, any perceptual model of ESP would predict that the perceptual characteristics of the stimulus ought to be important. For example, we might expect size, clarity or relative position to have some effect. These are precisely the kind of variables which have already been shown to be irrelevant to ESP. However, this fact does not necessarily contradict a perceptual model for if some new perceptual system were involved we might not be aware of the relevant variables. This may be considered an unlikely possibility but should perhaps not be ruled out (see Blackmore, 1980). A more general approach is to vary the amount of information or redundancy in the stimulus material. If the process resembles perception then a stimulus with more information or more redundancy should be more effective.

In studies of perception the subject's expectancies interact with the type of material. For example, a subject primed with more information about a stimulus, such as its position, whether it will be in upper or lower case letters etc, will be able to identify that stimulus more quickly and accurately when it occurs (see Haber, 1966; Neisser, 1967). Similarly false information may slow down responses. If ESP resembles perception we should expect similar effects of set or expectancy on scoring levels. I know of no parapsychological experiments which have systematically varied subjects' expectancies or set for target type. These two possibilities were investigated in experiments in which the amount of information in the target was varied and the subjects' expectations changed (experiments 1 and 2).

Various memory models of ESP also predict effects of different target material. Those I have called paranormal storage models, of the type proposed by Carington (1945) or Price (1939), suggest that the information obtained in ESP is stored in the same way as memories and depends upon processing prior to that storage. For example a second person, or agent must create an idea or 'psychon' before it can be picked up by ESP. This leads to the prediction that better processing by an agent, perhaps producing clearer or more well defined ideas, would make for more effective ESP. In addition Carington stressed the importance of associations. His theory predicts that if one person makes a strong association between two ideas then another person, with access to the first should be able to retrieve the second. Assuming a close enough relationship between 'ideas' and stimuli or targets, we can predict that if an agent learns pairs of words, for example, then subjects presented with one of the pair should be more likely to

choose the correct pair word than if the agent merely looked at the pairs. In Carington's terms the first word would act as a 'K-object'.

An effect of agent learning is only specifically predicted by Carington's and Price's theories, but it is compatible both with Roll's psi-field theory (Roll, 1964) and his 'memory theory of ESP' (Roll, 1966), in fact Roll (1966) discusses the possible importance of the agent in ESP. Such an experiment cannot therefore discriminate between these theories. Nonetheless, if an effect were found it would be evidence for a memory theory rather than the perceptual model and it should be possible to proceed to more specific tests of the particular theories. Two experiments of this kind are reported here (experiments 3 and 4).

Another approach is to ask directly whether the same stimulus variables affect ESP and memory in the same way. Since a great deal is known about stimulus variables affecting memory performance (see e.g. Baddeley, 1976; Brown, 1976) this should provide fertile ground for experimental comparisons. One could vary ESP targets along relevant dimensions and determine the effect on performance. However, two problems immediately arise to complicate the issue. The first is that the effect of stimulus variables on memory performance is specific to the type of memory task. The second is that some of the effect of stimulus variables might be on the learning stage of the task, and this is obviously missing in the case of ESP. Let us consider these in turn and see whether predictions for ESP can still be derived.

The nature of the task

For different types of memory task different stimulus variables affect performance. For example in free recall and item recognition, performance is better with pictures than with concrete words, and worst with abstract words (Paivio, 1976). It appears that concreteness affects these tasks in similar ways and it has been argued that imaginal coding, which is more likely for concrete items, occurs alongside verbal coding of words. A different effect is found with sequential memory tasks, that is ones requiring memory for the order of unrelated items. Here imagability or concreteness of items does not appear to affect performance (Paivio, 1971).

Comparing the effects of frequency (in the language) of stimulus

words the so-called frequency paradox arises. That is, for free recall of verbal material common words are recalled better than uncommon ones, but the reverse is the case for recognition (Gregg, 1976). On a retrieve-recognise model of memory this is accounted for if the retrieval process generates more common words but the recognition process is more effective for uncommon ones, especially if the recognition attributes include recency and familiarity.

Considering just these two variables there is already a problem. Do we compare ESP with any one type of memory task? If so which one? I would suggest that different types of ESP task are comparable to different memory tasks. Most interesting to note, is that in the usual ESP test, the requirement is to generate a small number of items, which are themselves unlikely to be forgotten, in the right order. This seems most closely comparable to the sequential memory task which is, unlike recall and recognition, unaffected by stimulus concreteness, and is a task rarely used in memory studies.

More familiar tasks are variants of free recall, cued recall (such as paired associate learning) and recognition. Analogues of these can be suggested for ESP. Free response ESP tasks can be likened to free recall. The task used by Rao, Morrison and Davis (1977) and that suggested here for the agent learning experiments, provide analogues of paired associate learning. As for recognition, I can think of no common ESP task comparable, but I would suggest one in which subjects were presented with a large number of items and were asked to choose those they thought were targets. Interestingly, if we postulate a similarity between ESP and memory, then this task might arguably be far easier than the conventional tasks on the grounds that recognition is usually easier than either recall or sequential learning. For this reason experiments using this type of task were carried out here.

Returning to the effects of stimulus variables, we might expect to find that frequency and imagability affect ESP in different ways according to the task. Since the sequential learning task is least likely to be affected, other ESP tasks would be preferable. I chose to use a recognition-type task and to vary frequency and imagability of target words (see experiment 5).

Few previous studies are relevant here. Gambale (1976) used the paired-associate technique designed by Kanthamani and Rao (1975) and varied the frequency of the words used. He found no effect of this variable on ESP scores, but in any case it is difficult to know why

any such effect would be expected. In this method the words are not used as targets, as discussed here, but are used as items in a learning task, the ESP task being to ring either the trigram or the word in each pair at recall. Possibly motivational factors might mediate such an effect, but this method is not strictly relevant here. (It is discussed in more detail in Blackmore 1980).

Somewhat similar is the study by O'Brien (1976), but he used both a recall and a recognition task as well as varying frequency. Again this study is not directly relevant here since the ESP task was to write the recalled word in one of two spaces. The words themselves did not act as targets. The same can be said of Sargent's (1978) study investigating the interaction between visual imagery and psi. Both frequency and imagability of learned words were varied and the ESP task was to write the letters of the recalled words in different boxes. No direct effect of word imagability or frequency was reported, but an interaction was found between the subjects' visual imagery scores and word imagability.

The only study to vary the targets themselves was reported recently by Kanthamani and Rao (1979). Using a standard clairvoyance method, they varied imagery, concreteness and meaningfulness of target words but found no systematic effect on ESP scoring. Although this study varied the target words, the ESP task was different to that argued here to be most likely to show an effect.

These studies provide little indication of any effect of these variables, but only one used the varied words as the targets in the ESP task, and this used the familiar sequential-type task. With the task suggested here, some effect might be found. But before carrying out such an experiment we should ask what predictions would be made on the basis of various theories of ESP.

According to any perceptual model of ESP we might expect frequency to be the major predictor of ESP performance. Since high frequency words are more easily perceived (Paivio, 1971) we would expect them to make better ESP targets. Imagability would not be expected to affect ESP.

Theories which state that ESP and memory involve the same processes (such as those of Carington 1945, or Price 1939) lead to quite different predictions. In general we should expect the same effects on ESP and on memory where the tasks are comparable. For the tasks

suggested here we should expect low, not high frequency words to make better targets, since frequency affects recognition in the opposite direction to its effect on identification. Also imagability should have some effect, with imagable words being better targets.

Roll's (1966) 'memory theory of ESP' leads to less unambiguous predictions. The above findings would be compatible with his theory, but another possibility is that the paranormal retrieval process does not utilise the same attributes as the normal process (see Blackmore, 1980). This might lead to the prediction that frequency (relevant in recognition) would affect ESP, but not imagability, although I believe other predictions are possible. Nevertheless, Roll's theory could still be distinguished from the perceptual model on the basis of the effect of frequency. This proposed experiments could therefore provide a direct test of both perceptual and memory models of ESP. If this approach were successful further experiments could test the same variables in different tasks and attempt to distinguish the various theories in more detail. These speculations, though, are somewhat undermined by the second consideration.

The effect of learning

The effects of certain stimulus variables on memory performance have been compared with their effects on ESP, but an important difference exists between the two. In the case of a test of memory a subject learns, or is exposed to, certain material and subsequently shows evidence of having learned it. The effect of variations in material used may act at both the learning and reproduction stages.

In paired associate learning meaningfulness and frequency of the response item will affect performance more than that of the stimulus item, but the reverse is so for imagability which affects the stimulus more than the response. Further indications that imagery affects learning rather than retrieval are that instructions to use mnemonics during the learning aid affects both recall and recognition, presumably by improving imaginal coding (Paivio, 1976). Detailed discussion of this issue is not relevant here. Suffice is to say that there are many indications that the coding strategy used at learning affects retrieval performance and is in turn affected by the material used.

In the case of ESP, though, there is no learning and no input coding in the percipient. This has different consequences according to the different theories. On a perceptual model of ESP the input process is unspecified but there is little opportunity for any input coding. We would not therefore expect variables which affect such coding necessarily to affect ESP. On the models of Carington and Price prior coding does take place, but in another individual. Therefore stimulus variables may affect learning in that individual but not necessarily the percipient's retrieval. On Roll's 'Psi field' theory (Roll, 1964) again no input processing is specified and on his 'memory theory of ESP' (Roll, 1966) even retrieval apparently occurs paranormally and therefore both stimulus and response variables may be irrelevant.

All this may be offset to some extent by the consideration that prior coding of those items by the percipient may be related to the type of material. Where targets are words such variables as meaningfulness, familiarity and imagability will already have influenced organisation within the percipient's memory. However, individual differences may be large, and comparisons with a single learning task almost meaningless. Therefore these models do not predict any effect of variables which predominantly affect coding at the learning stage.

This really brings us face to face with the intrinsic problem of ESP, that without organisation and coding at input it is well-nigh impossible to see how information could be retrieved. Of course a partial answer is available on the models of Price and Carington, for at least they posit some form of coding, albeit in another individual. They cannot account for clairvoyance, but it may be worth considering that the presumed equivalence of clairvoyance and telepathy might be in error.

Returning to the other models we can now see that the target variables which affect ESP should be those whose primary effect is on retrieval rather than on learning. Since there is evidence that frequency is important in retrieval, especially in recognition, but imagery plays a greater role in learning we should expect the greater effect of frequency. This means that the expected effects may be limited, but even so, if effects were only found for frequency this would still allow some discrimination between the theories. I concluded that a straightforward test of the effect of frequency and imagability of target words would provide data with which to test the

models and carry the above arguments further. For the reasons already discussed a recognition-type ESP test was used for the preliminary study and the imagability and frequency of the target words was varied (see Experiment 5). I hoped that the results of this experiment would provide some answers on which to base further studies.

The approach just considered compared the effects of target variables on memory and ESP by assuming the effects on memory. A more direct comparison may be made by measuring the memorability of targets in an ESP experiment, in that experiment. Memory models of ESP would predict that the more memorable items should also make the more effective targets, for any subject. In experiment 6 subjects were therefore given a memory test and an ESP test in the same session and using the same items. These were words varied in frequency and meaningfulness to maximise memorability differences. The memory test was recall and the ESP task the same kind of recognition-type test already mentioned. The number of times each word was recalled and the effectiveness as ESP target were compared. It could be argued that it would be preferable to have more directly comparable ESP and memory tasks and an experiment of this kind is planned.

All the above approaches have in common the aim of comparing the effect of differences in stimulus material on both ESP and other cognitive tasks. Five experiments were carried out and are reported here.

PRELIMINARY EXPERIMENTS

EXPERIMENT 1

In two experiments (this and experiment 2) stimuli of varying amount of information were used to determine whether this affected ESP scoring rate. The subjects' expectations were also varied or elicited so that on some trials they conformed to the target type (e.g. a picture was target and a picture was expected) or they conflicted (e.g. a picture was target but a word was expected). In the first experiment the sole subject was myself.

There were 10 target items each of which could appear in 5 forms. These were a complete word, clearly written in upper case, a degraded

word of the same form, a word and matching picture together, a complete picture and a degraded picture. There were 50 stimuli altogether. Each was drawn on a card approximately 2x3 inches. Examples are shown in Figure 1.

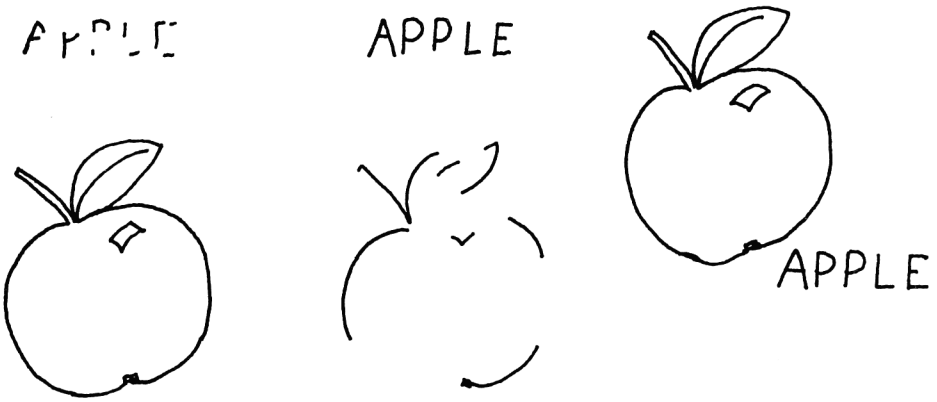

FIGURE 1
Examples of targets
Experiments 1 and 2

The target orders were prepared by an assistant (T.T.) who took no further part in the experiment.There was one of each of the 50 stimuli in each of 10 envelopes. The subject had a sheet on which to write the guessed order of the cards and a list of the 10 items to choose from. On half the 50 trials of each run the subject visualised pictures and on half words.After all 10 runs were complete the envelopes were opened and the order recorded. This was later checked and rechecked against the response order. The number of hits on each of the five types of target was recorded.

RESULTS

The number of hits of each type can be seen in Table 1. There is no sign of any ESP in the overall scores. MCE is 5.0, the obtained mean was 4.5 (t=0.92, df=9, p=0.38).

TABLE 1
Results of experiment 1

Target type	Number of hits	Visualise pictures	Visualise	Match	Mismatch
1 Degraded words	13	7	6	6	7
2 Complete words	5	3	2	2	3
3 Words and pictures	9	6	3	-	-
4 Complete pictures	8	5	3	5	3
5 Degraded pictures	10	5	5	5	5

We can determine whether target type has any effect on scores. We might expect to find most hits on the targets where both word and picture was given and least for the degraded words and pictures. A histogram should show a maximum in the middle. The histogram obtained is shown in Figure 2. There is no significant departure from the pattern expected by chance (chi square =3.78, df=4, p=0.44).

Other variables of interest were whether words or pictures were visualised during the guessing. There were more hits when visualising pictures, but not significantly so (t=2.74, df=4, p=0.52). It might be expected that more hits would be obtained when a match occurred, that is when the target was in the form expected, but there was no difference (t=0). The results obtained do not confirm any of the hypotheses but there was only one subject and few trials. A second experiment was therefore carried out with more subjects.

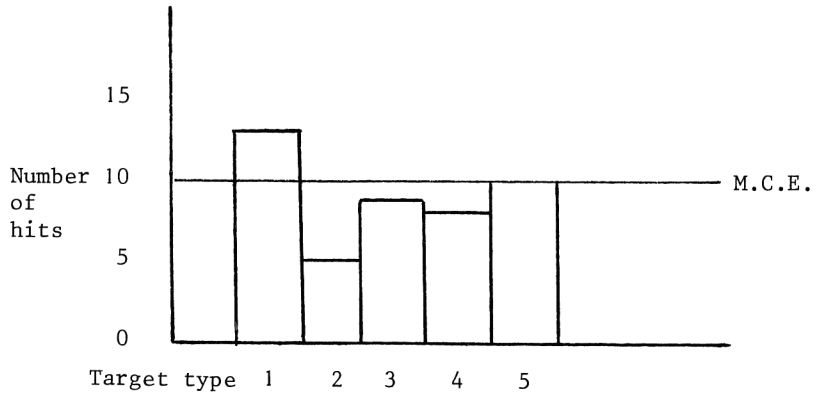

FIGURE 2
Histogram showing the number of hits
for each target type. Experiment 1

EXPERIMENT 2

The target material and objectives were the same as for experiment 1. but a larger group of subjects and a different procedure were used.

Subjects were 43 students. A few completed more than one run, there being a total of 50 runs. The same target cards as in experiment 1. were used but they were arranged differently. 50 envelopes were prepared by an assistant (T.T.) so that each contained a total of 20 cards in random order, all of the same type. There were 10 envelopes of each of the 5 types, making 50 in all.

Subjects were given a sealed, numbered envelope and an answer sheet with 20 blank spaces and the list of 10 target items to choose from. In addition to filling in their guesses they were asked whether they thought the envelope contained words or pictures. After they had completed their guesses they gave their envelopes and sheets to

another student for marking. The number of hits on the 5 different target types was recorded and the results analysed in terms of target type and expectation. All sheets were subsequently rechecked.

RESULTS

The mean number of hits, 1.62 is significantly below MCE of 2.0 ($t=2/13$, $df=49$, $p=0.04$). This may indicate psi-missing but there appears no clear pattern relating target type to number of hits (see table 2., chi square= 2.27, $df=4$, $p=0.69$). These results are shown as a histogram in Figure 3.

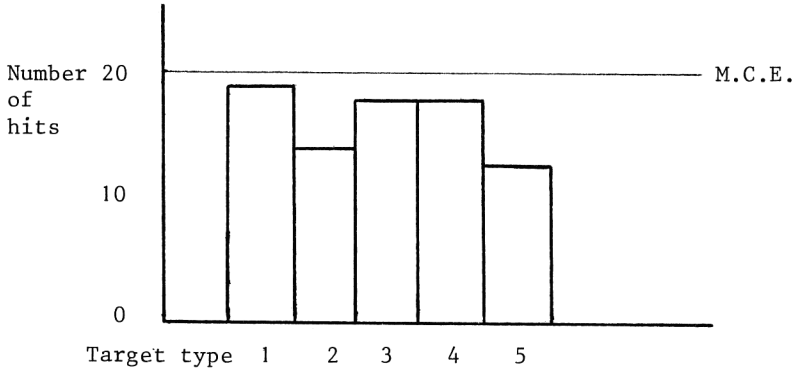

FIGURE 3
Histogram showing the number of hits for each target type. Experiment 2

Some subjects thought the targets were words and others pictures, but this appeared to make no difference to the scores they obtained. (chi square=0.62, $df=1$, $p=0.43$. 3 subjects have been excluded as they did not answer the question unambiguously). It also appears to

TABLE 2
Number of hits for each target type in experiment 2

Target type:	Degraded words	Words	Words and pictures	Pictures	Degraded pictures
Number hits	19	14	18	18	12

make no difference whether the subjects' expectation matched their target types or not (chi square =0.76, df=1, p=0.38, data for type 3 excluded).

CONCLUSION

In this second experiment there was evidence that psi-missing occurred but none of the expected effects was found and it must be concluded either that the amount of information in the target, and the subjects expectations regarding the form of target, have no effect on ESP, or else this experiment was incapable of demonstrating any such effect.

EXPERIMENT 3

The following two experiments compared ESP scores on a test which required the subject to match pairs of words either when 'correct' pairs had been learnt by an agent or when only looked at by him. Subjects were 46 students in a parapsychology class.

For each trial a stimulus word and five other words were given, the task being to choose the correct pair for the first word. The 'correct' pairs were chosen from random number tables by an assistant

(K.K.) who took no further part in the experiment. Of the 20 trials half were randomly assigned to be 'learning' trials and half 'non-learning' trials. The subjects were unaware of the difference. It should be noted that only one target order was used for all subjects, allowing for a stacking effect. If the results had warranted further experiments these would have eliminated this problem.

PROCEDURE

An agent and assistant were chosen from the group and went outside where the assistant gave the agent a list of 10 word pairs to learn and tested him until he responded with the correct pair to every word on one run. He then notified the experimenter that learning was complete and gave the agent another list of 10 word pairs to look at. Meanwhile the subjects were given a response sheet listing the 20 stimulus words, each with 5 possible pair words and were asked to underline the one which they thought the agent was looking at. When all the subjects had completed this task they gave their sheets to another student, the answer sheets were brought in and they were marked. All were rechecked later.

RESULTS

The mean number of hits was 4.04. This is not significantly different from MCE of 4.0 ($t=0.15$, $df=45$, $p=0.88$). The results can be divided on the basis of whether the pairs were learned or not (see table 3). Neither of these subgroups shows a significant deviation from MCE. Although there are more hits for the learned pairs, as expected, the difference is not significant ($t=1.42$, $df=45$ $p=0.16$). However, since the results were in the expected direction the experiment was repeated with a different group of subjects.

EXPERIMENT 4

This experiment used target words and procedure identical to that of experiment 3. A new set of 'correct' pairs was chosen as before. Subjects were 23 students in a parapsychology class.

TABLE 3
Results of experiment 3

	Mean	MCE	t	df	p
Learned pairs	2.24	2.0	1.26	45	0.21
Unlearned pairs	1.85	2.0	0.85	45	0.40
Total	4.04	4.0	0.15	45	0.88

RESULTS

The results can be seen in Table 4. Neither the total scores nor the scores on either type of pair show significant differences from MCE. Both learned and unlearned pairs give scores below MCE but there is no significant difference between them ($t=0.19$, $df=27$, $p=0.85$).

CONCLUSION

The results of these two pilot experiments provide no evidence to suggest that an agent learning pairs of words aids a subject in choosing the correct pair to a given stimulus word. No further experiments of this type were therefore carried out.

EXPERIMENT 5

It was predicted that according to a perceptual model of ESP, frequent words would make the best targets and imagability should have no effect. Many outcomes are compatible with Roll's 'memory theory of ESP' but according to most memory models infrequent, high imagery words should be the best targets. In this experiment the effects of

TABLE 4
Results of experiment 4

	Mean	MCE	t	df	p
Learned pairs	1.82	2.0	0.74	27	0.47
Unlearned pairs	1.86	2.0	0.50	27	0.62
Total	3.68	4.0	0.88	27	0.39

imagery and frequency of target words were tested. Subjects were 56 students in a parapsychology class.

Targets were 64 words falling into four groups of either high or low frequency and high or low imagery. The words were taken from Paivio, Yuille and Madigan (1968). Frequent words were designated A or AA, infrequent had a frequency of less than 10 per million. High imagery words had an i score of more than 6.5, and low imagery, less than 3.0. Examples from each group are given in Table 5.

TABLE 5
Examples of words used in experiment 5

FI:	Frequent, high imagery	APPLE, CHAIR, FLOWER
Fi:	Frequent, low imagery	DUTY, EFFORT, TROUBLE
fI:	Infrequent, high imagery	ABDOMEN, FJORD, TRELLIS
fi:	Infrequent, low imagery	ALLEGORY, FEUDALISM, SPREE

An agent and assistant were chosen from among the students and went outside the lecture theatre. The assistant was asked to give the agent 4 lists of 16 words each, at specified intervals, and ask him to concentrate on them. Meanwhile the subjects were given a set of 4 sheets each listing the 64 words. For each of four runs, at approximately 6 minutes intervals, they were asked to underline those 16 words which they thought the agent was looking at. After the last run all the test sheets were collected in and were later marked for each of the four types of word separately.

RESULTS

Overall ESP scores (for N=56) gave a mean of 16.02 which is not significantly different from MCE of 16 ($t=0.04$, $df=55$, $p=0.97$). To compare the results on different target types the percentage hits for each type was calculated. Since the subjects chose different numbers of each type the relevant measure was percentage of choices of each type which were hits. In all cases MCE is 1 in 4 or 25%, although the number of choices varies. The results can be seen in table 6. (N=55 since part of one subject's data was lost).

TABLE 6
Results of experiment 5

	Type of Target				
	FI	Fi	fI	fi	MCE
Hits	217	227	236	228	
Misses	647	669	700	651	
Total	354	896	936	879	
% Hits	25.4	25.3	25.2	25.9	25.0 %

It can be seen that there are only very small differences in the

effectiveness of the different types of target. For the number of hits by target type chi square =0.42, df=3, p=0.94. A 2-way ANOVA was planned but was not carried out since the differences were so small. It appears that type of target word made no difference to the percentage of hits.

DISCUSSION

There were two faults in the design of this experiment. The same target order was used for all the subjects. 4 runs with similar target material were carried out to try to minimise spurious effects but it would be better to have a different target set for each S. This was planned but in view of the results obtained here was not carried out. Instead a rather different kind of experiment (see experiment 6) was preferred.

Secondly word length was confounded with target type, the fi words tending to be the longest. Again it would be preferable to have words of equal length although, of course, this would only become important if significant differences were found.

These faults might be expected to produce spurious differences but are unlikely to be responsible for the uniformly chance results obtained here. In view of these results it can only be concluded that either frequency and imagery of target words has no effect or this experiment was incapable of detecting it.

MAIN EXPERIMENT

In the previous experiment the memorability of target words was assumed to be related to their capacity to evoke imagery. In this experiment (experiment 6) using a similar ESP test, memorability was measured for all target words used. In addition the correlation between the subjects' ESP scores and their memory scores was calculated and the negative response bias hypothesis (Stanford, 1967) tested. Problems found in the previous experiments were eliminated and all the subjects had individual target orders. It was predicted that, according to a memory model of ESP, target memorability should be positively correlated with the number of hits on that target.

METHOD

Subjects were 45 students in a parapsychology class. Target words were 50 five-letter nouns. Some were common and neutral, such as APPLE, DRESS, SUGAR. Some were uncommon such as SPREE, IRONY, FJORD, and yet others were 'naughty' or emotionally significant, such as BIRTH, PENIS, SCREW. The different types were used so as to encourage different recall rates. The ESP test consisted of choosing 10 from these 50 words. Individual target lists were prepared by computer for each subject and sealed in numbered opaque envelopes by an assistant (T.T.) who took no further part in the experiment.

Subjects were given a list of the 50 words and a sealed envelope containing a list of 10 of these. They were asked to use their clairvoyance to 'see' which 10 and to underline them. When all had completed this they gave their sheets in and then were, unexpectedly, given a blank sheet and asked to recall as many of the 50 words as they could. Finally the sheets were marked by other students. All were rechecked later.

For each subject the number of ESP hits and the number of words correctly recalled were recorded. For each word the number of times it was chosen as a guess, the number of hits on it, the number of times it was target, and the number of times it was recalled were recorded.

RESULTS

Overall ESP scores give a mean of 1.89 which is below MCE of 2.0, but not significantly so ($t=0.76$, $df=44$, $p=0.45$). The mean number of words recalled was 14.3.

Memorability of targets

The different types of word were recalled at very different rates. The mean number of times each was recalled, the memorability score, was 11.2, but the words STORE, CHAOS, and FLASK were only recalled once each while SPERM and PENIS were recalled 31 times each. To this extent the words chosen were effective, but although the memorability varied greatly, this was not found to be related to the effectiveness

of each word as ESP target.

To determine this relationship an ESP score was assigned to each word which would take account of the number of times each appeared as target and the number of times each was chosen as a guess as follows: ESP score = 100 x (number of hits)/(times target x times chosen). This gives a mean ESP score of 2.21 with MCE 2.44. ESP score correlated with memorability score gives r=-0.26 (z=1.84, p=0.066). It appears that memorability is not related to how good an ESP target a word is.

Correlation between ESP and memory

The data obtained here also made it possible to see whether there was a correlation between ESP and memory scores, which may have a bearing on theories of ESP (see Blackmore, 1980). The mean number of words each subject recalled was 14.3 out of 50 (S.D.=5.07) indicating that the subjects found the task difficult. The correlation between memory and ESP scores is r=-0.16 which is not significant (t=1.06, df=43, p=0.29).

Response bias

This experiment provided an opportunity to test the negative response bias hypothesis. Stanford (1967) suggested that negative response bias aids ESP. That is, for a response which is unlikely to occur, when it does occur it is more likely to be a hit. In this experiment the number of hits on popular words was compared with the number on unpopular words. Words were divided into those chosen 9 or more times, and those chosen less than 9 times (N=21 and 29 respectively). The proportion of hits for each group was not significantly different (t=1.52, df=48, p= 0.135).

A more sensitive test might be to correlate word 'popularity' with ESP score. A negative correlation would be expected but was not obtained. r=0.214 (z=1.50, p=0.134).

DISCUSSION

It might have been preferable to have equalised the number of times each word appeared as target so as to simplify the ESP score used. However, I believe that the measure used here was satisfactory for testing the relationship between ESP and target memorability, but no such relationship was found.

In conclusion this experiment was intended to test firstly whether memorable words make better ESP targets and secondly whether subjects who score highly on ESP also recalled more words. There was no overall evidence of ESP, no evidence that memorable words make better targets and no significant correlation between ESP and memory scores.

CONCLUSIONS

Six experiments have been discussed, all of which attempted to investigate the effects of varying target material on ESP. In the first two the amount of information in the ESP targets was varied. In the first, preliminary study, there was no evidence of ESP. In the second, main study, overall scores were significantly below MCE but in neither was there any effect of variations in information content.

The next two experiments involved the learning of word pairs by the agent in a GESP test. Again there was no evidence of ESP and no difference between trials in which the agent learned or only looked at word pairs. In an experiment with words varying in imagability and frequency there was also no sign of ESP and no evidence that these two variables affected the efficacy of targets. Finally the memorability of words was measured but no correlation with ESP was found.

If we consider all these experiments, for overall ESP scores one t test in 6 gave significance at the level of $p<0.05$. None of the expected effects of varying target material was found to be significant. In the primary analyses 12 independent significance tests gave one $p<0.05$. I think we may conclude that there is no justification for rejecting the null hypothesis that chance alone accounted for all the results. Once again it has been impossible to test hypotheses about the nature of ESP when no ESP occurred.

ABSTRACT

If ESP resembles the processes of either perception or memory we should expect variations in the target material used to affect ESP scoring systematically. Predictions for such effects are drawn for various theories of ESP on the basis of psychological findings. The theories can then be tested by manipulating relevant target variables. For memory theories of ESP problems arise with the comparison of different ESP and memory tasks, and the fact that there is no identifiable equivalent of the learning stage in ESP.

Six experiments are reported. In two the amount of information in targets was varied but was not found to affect ESP scores. In two no difference was found between trials in which an agent learned or only looked at target word pairs. Imagability and frequency of target words were not found to affect ESP scores and finally target memorability was measured, but no relationship with ESP scores was found. Overall ESP scores were significantly different from mean chance expectation in only one experiment (2). It was not possible to draw conclusions about the various theories of ESP on the basis of these results.

REFERENCES

Baddeley, A.D. 'The psychology of memory', Harper and Row, London, 1976.

Blackmore, S.J. 'Correlations between ESP and memory', E.J.P., 1980, 3, 127-147. (a)

Blackmore, S.J. 'Extrasensory perception as a cognitive process', unpublished Ph.D. thesis, University of Surrey, 1980. (b)

Blackmore, S.J. 'Errors and confusions in ESP', to be printed in E.J.P., 1981, 4, issue 1.

Brown, J. 'Recall and recognition', Wiley, London, 1976.

Carington, W. 'Telepathy: An outline of its facts, theory and implications', Methuen, London, 1945.

Gambale, J. 'Word frequency and association strength in memory-ESP interaction: A failure to replicate', J.o.P., 1976, 4, 339-340. (abstract)

Gregg, V. 'Word frequency, recognition and recall', in Brown, J. (ed) 'Recall and recognition', Wiley, London, 1976.

Haber, R.N. 'Nature of the effect of set on perception', Psychological Review, 1966, 335-351.

Haber, R.N. and Hershenson, J.'The psychology of visual perception', Holt, Rinehart and Winston, New York, 1973.

Herriott, P. 'Attributes of memory', Methuen, London, 1974.

Kanthamani,H. and Rao, H.H. 'A study of the memory-ESP relationship using linguistic forms', in Morris, J.D. et al (eds) 'Research in Parapsychology 1974', Scarecrow Press, Metuchen, N.J., 1975, 150-157.

Kanthamani, H. and Rao, K.R. 'Imagery, concreteness and meaningfulness of target words in relation to psi scoring', J.o.P., 1979, 43. (abstract)

MacFarland, J.D. and George, R.W. 'Extrasensory perception of normal and distorted symbols', J.o.P., 1937, 1, 93-101.

Murphy, G. 'Dr Rhine and the mind's eye', American Scholar, 1938, 7, 189-200.

Neisser, U., 'Cognitive psychology', Appleton-Century-Crofts, New

York, 1967.

O'Brien, D.P. 'Recall and recognition processes in a memory-ESP paired- associate task', unpublished. Paper presented at the SERPA conference, January 1976 (Abstract in J.o.P., 40, 57-58).

Paivio, A. 'Imagery and verbal processes', Holt, Rinehart and Winston, New York, 1971.

Paivio, A. 'Imagery in recall and recognition', in Brown J. (ed) 'Recall and recognition', Wiley, London, 1976.

Price, H.H. 'Haunting and the "Psychic Ether" hypothesis', Proceedings S.P.R., 1939, 45, 307-343.

Rao, K.R., Morrison, M. and Davis, J.W. 'Paired associates recall and ESP: A study of memory and psi-missing', J.o.P., 1977, 41, 165-189.

Rhine, J.B. 'Extra-sensory Perception', Boston Society for Psychical Research and Faber, London, 1935.

Rhine, J.B. 'History of experimental studies', in. Wolman, B. (ed) 'Handbook of Parapsychology', Van Nostrand, New York, 1977.

Rhine, L.E. 'Some stimulus variations in extrasensory perception with child subjects', J.o.P., 1937, 1, 102-113.

Rhine, J.B. and Pratt, J.G. 'A review of the Pearce-Pratt distance series of ESP tests', J.o.P., 1954, 18, 165-177.

Roll, W.G. 'The psi field', Paper presented at the Seventh Annual Convention of the Parapsychological Association, Oxford University,

September 1964.

Roll, W.G. 'ESP and Memory', International Journal of Neuropsychiatry, 1966, 2, 505-512.

Sargent, C.L. 'Interactions between visual imagery and psi', J.S.P.R., 1978, 49, 805-823.

Stanford, R.G. 'Response bias and the correctness of ESP test responses', J.o.P., 1967, 31, 280-289.

Stanford, R.G. 'Toward reinterpreting psi events', J.A.S.P.R., 1978, 72, 197-214.

Van Busschbach, J.G. 'An investigation of ESP between teacher and pupils in American schools', J.o.P., 1956, 20, 71-80.

Van Busschbach, J.G. 'An investigation of ESP in first and second grades in American schools', J.o.P., 1961, 25, 161-174.

Van de Castle, R.L. 'An exploratory study of some variables relating to individual ESP performance', J.o.P., 1953, 17, 61-72.

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A REAL LIFE EXPERIENCE SUGGESTIVE OF ESP

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The discussions of the psi-mediated instrumental response (PMIR) and of the conformance behaviour model (Stanford, 1974; 1978; Edge, 1978) prompted me to put on record some recent events which suggest the possibility of the involvement of psi. Coincidence as an alternative cannot be ruled out but this problem is difficult to avoid in a real life situation. The events at least are clear, can be verified and does not seem to depend on a great deal of subjective interpretation. If it is assumed that psi was involved the case seems to be in agreement with the PMIR model but also with general assumptions about observational theories (Millar, 1978) if it is assumed that feedback and suitable REGs (e.g. the central nervous systems of one or more of the people) were involved.

In January 1979 I was one of three Europeans and 10 Nepalese trekking from Pokhara (in Nepal) via Tatopani along the Kali Gandaki river to Muktinath, from there via the Thorong La pass to Manang, along the Marsyandi river and eventually back to Pokhara. Near Marpha, a settlement at the Kali Gandaki, our guide tried to buy some vegetables at a government experimental farm. He found no-one in attendance and looking around was bitten by a dog. The wound was only superficial but rabies is not uncommon in Nepal and the following day we looked for medical advice in Jomoson on our way to Muktinath. We were told that rabies must be expected in 10% of dogs and that the only way to find out was to wait and see whether the dog would die within 10 days. If that should happen, we would have to assume that

our guide had been infected and he would have to be in Pokhara for treatment not later than 14 days after the infection. At that stage our return to Pokhara was scheduled in 20 days. We did not have enough time to wait near Marpha if we wanted to continue our trek. After long discussions we agreed with our guide that he would take us across the Thorong La pass to Manang and Chame. We expected to reach Chame nine or ten days after the incident in Marpha. From Chame we could try to get in touch with the experimental farm via the local telegraph office (operating the only transceiver between Jomoson and Pokhara). The farm in Marpha was also known to be equipped with a transceiver. If the dog had died our guide would be able to walk ahead of us and reach Pokhara in four or five days, i.e. about fourteen days after the possible infection rather than in twenty as scheduled.

With these possible arrangements in mind we felt justified to continue with our trek from Jomoson. Between Pokhara and Jomoson trekking has become quite popular and in this region it would not have been too difficult to proceed without a guide and to rely on other trekking parties for assistance if necessary. The Thorong La pass (17780 ft) is still a substantial barrier and we met only four Europeans after we had crossed it and before we reached Pokhara. Although it would have been possible to return to Pokhara without our guide this looked like a much more difficult task than we had anticipated in Jomoson. It also became clear that our guide was anxious to complete the trek with us probably because he had only recently been promoted to the position of guide - we had met him two years ago when he was a cook's assistant in a larger trekking party. It was therefore with some feeling of anxiety and perhaps guilt that we approached Chame nine days later. We wondered whether we had been persuaded too easily in order to continue with what was otherwise a most enjoyable experience and whether we should not have been more cautious. In particular the Annapurna Himal (up to 26000 ft) was now between us and Marpha and with fairly dated telecommunication equipment it was not at all certain whether it would be possible to establish a connection. At best we could hope that the Chame office might reach some other stations which in turn might reach the farm in Marpha. We were also aware that the farm station would not necessarily be in operation at regular intervals. There is no telegraph office in the Marpha settlement. Any delays in Chame would reduce the chance of our guide reaching Pokhara in time.

About two hours' walk from Chame we stopped for lunch in a forest for some shelter because it had started to snow and we remained near

the trek leading to Chame. A Nepalese walking on this trek stopped and started to talk to us in English. He turned out to be the owner of the dog in Marpha and explained to us that the dog was inclined to bite because she had pups nearby and that she had been vaccinated against rabies.

Under the circumstances this was quite a remarkable sequence of events and a most satisfactory solution to our problems. It immediately suggested to me the possibility that psi might have been involved. I did not think of Stanford's paper discussing PMIR and I had not yet received his 1978 publication which later reminded me of his PMIR model and since it is impossible to claim more than the possible involvement of psi it did not occur to me that I might wish to put these events on record at some later date. Consequently I made no attempts to find out more about the background circumstances which lead the Nepalese to our lunch stop at that time (except that he toured the region to inspect government sponsored agricultural projects). Our own schedules were not fixed beyond a rough timetable and there were various opportunities when psi could have brought about or influenced decisions which resulted in PMIRs. Many lunch stops were arranged at some distance from the trek and the particular stop had been selected on short notice because of the weather conditions.

Psychologically the moment of 'feedback' - when we found out that we talked to the owner of the Marpha dog and that the dog was vaccinated - was an important one and may well have triggered (in terms of 'backward causation') the events which led to the satisfactory outcome.

In this way the experience could also fit in with the observational theories if it is assumed that one or more of the people involved operated as random event generators (REGs) and/or that other REGs existed (e.g. some aspects of particular weather conditions) and that PK induced changes in connection with the REGs played a significant part in the solution of our problem.

It is interesting to speculate how far these processes may have occurred below the level of awareness because although we were quite conscious of our desire to have the problem resolved, it had not occurred to anyone that we could possibly meet the owner of the dog. If it is kept in mind that in experimental situations psi may operate below the level of awareness it is not altogether unreasonable to suggest that even feedback may occur at this level.

After all during an experiment with a Schmidt type REG it is quite difficult to explain to participants in what way PK is supposed to work and it is only the end result, a change in the distribution, which is seen as the goal of the experiment. Probably the situation is not all that different when dice are thrown even though some people find it easier to imagine that they 'push' the dice in a certain direction, particularly during a placement experiment. The fact that in the experimental situation people try to use psi (whatever that may actually mean) creates perhaps only a difference in degree compared to the more spontaneous situation discussed above. That is, in our case we were quite conscious of the happy solution to our problem but nobody could point to events which he or she had tried to influence and which led to the satisfactory outcome. Consequently if one talks of feedback at all - and that still seems reasonable under the circumstances if it is assumed that psi played a role - feedback may have operated to some extent below the level of awareness or it may need to be equated with the satisfactory solution to a problem even though the steps which led to the solution remain unknown.

REFERENCES

Edge, H.L. 'A philosophical justification for the conformance behaviour model', J.A.S.P.R., 1978, 72, 215-231.

Millar, B. 'The observational theories: A primer', E.J.P., 1978, 2, 3, 304-332.

Stanford, R.G. 'An experimentally testable model for spontaneous psi events. I. Extrasensory events', J.A.S.P.R., 1974, 68, 35-57.

Stanford, R.G. 'Toward reinterpreting psi events', J.A.S.P.R., 1978, 72, 197-214.

WHAT IS WRONG WITH DISEMBODIED SPIRITS?

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Some philosophers have contended that there is something conceptually wrong with the notion of disembodied spirits (note 1). Many kinds of objections have been raised. In this paper I will reply to two kinds, the objection that disembodied spirits could not exercise any sort of communication or agency, and the objection that disembodied spirits could not be traced, shown to be identical with spirits who had previously been embodied. The reply made to these objections will depend upon establishing another point as well, the close linkages between certain parapsychological powers and powers we usually call ordinary powers.

This affinity between parapsychological powers and ordinary powers is highlighted by the fact that physicalistic scientists regard both embodied spirits and disembodied spirits as equally objectionable. Scientists dispense with both sorts of spirits on the grounds that 'proper' methodology precludes them (note 2). Spirits in all forms are things Occam's razor shaves off the scientific face. I shall argue for the philosophical intelligibility of disembodied spirits based on their conceptual continuity with minds and their ordinary powers. Both embodied minds and disembodied minds are para-scientific, super-natural. Spirits lie beyond the boundaries of scientific investigation.

MINDS AND THEIR POWERS

The world as felt includes minds as well as brains. Our world as experienced by us fits the Cartesian or Platonic model, and not the electrochemical. Our world as experienced includes colors and sounds, not frequencies of waves, and colors and sounds themselves are not subject to scientific analysis. Science discloses that at the same time we experience colors and sounds there are bodily processes going on in the particular bodies which we call ours, but the colors and sounds themselves, the experienced qualities, never become part of scientific investigation. Neither light waves nor brain molecules are red.

Our mental worlds are private. Others have full access to our real selves only as we let them, only as we reveal our thoughts and dreams to them. From my rapid-eye-movements it can be inferred that I am dreaming, and from some actions of my body it can be inferred whether my dream is erotic or frightening, but the full content of my dream can be known only if I reveal it. The landscape of Mars, when I am dreaming my John Carter dream, is not findable in my brain. What is in my brain is electrochemical. Mind itself is, so to speak, 'para'-physiological, 'para'-scientific, 'super'-natural.

What I will claim is that standard dualistic accounts of mind's relation to brain require that mind be supplied the very ontological status and qualities that it would need to exist and to be able to act, learn etc., in a disembodied state. In short, embodied minds have to be supposed to have parapsychological natures and powers. Popular understanding often fails to appreciate this fact because people persist in thinking of minds as located in skulls or at least linked to skulls by a set of quasi-mechanical connections, hence think of mind-brain relations as transactions of an ordinary physical sort. I will review a few of the notorious difficulties with this view.

In the first place, mind is not an ordinary space at all. Its contents cannot be found in the skull. Skulls contain brains and brain processes, not color-patches and ideas. What it means to say that a mind is embodied is not that a mind is in a body but that a mind has taken up a certain relation to a body. That relation to a body is discovered by the small child when it realizes that when one certain body gets its toe stubbed it feels pain but when other bodies get their toes stubbed it does not. The child learns which body is 'its'

that way. Put more philosophically, mind-body relations are accidental, not logical.

Since my mind is not in my body, it makes no strict sense to say that my mind travels about with my body. Since the location of the body gives mind its perspective on the world it is natural, but mistaken, to think of mind as located in a particular space, but it is the body that has that particular spatial location. The mind sees things from the spatial perspective of its body's sensors, but the mind is not at that spatial point.

The mind is not only not 'in' its body but it is not even physically connected to its body. In the first place the mind is not a physical system (if it were it would be in principle detectible and not private), and it does not then either gain energy from its brain or lose energy to it (creating the additional problem of violations of conservation of energy) when it interacts with its body. There is, furthermore, no gap in the brain or its activities where mind resides or when mind interacts with its brain. The telephone operator model or the engineer in the cab model does not work at all well for mind-brain interaction.

To make psycho-physical dualism work, embodied minds have to be supposed to have parapsychological powers. Let us consider a moment the similarities between powers required for normal psycho-physical interaction and parapsychological powers. In clairvoyance, mind supposedly 'reads' physical objects directly, without using light waves, eyes, optic nerves and brains. The object is 'there' to the mind as firings in the brain are 'there' to the mind, in a relation which is not that of proximity in space or mechanical connection in either case. In ordinary perception nothing travels from the stimulated brain 'to' the mind. No energy leaves the brain and enters the mind. Whatever the transaction that occurs, it leaves the sum total of energy in the world unchanged. The relation of mind to its brain has marked affinities with clairvoyance. One is ordinary viewing and the other is a viewing which extends to remote objects.

When minds act on the objects on the mantle in poltergeist cases, they do so directly, without sending energy to the object. In ordinary acts of willing, the mind causes energy in synapses to change without sending energy to them. In both types of acting on objects, PK and the ordinary type, mind causes objects to move without transferring energy to them. PK can usefully be understood as an extension to remote

objects of a power mind ordinarily used on its brain.

Given PK and clairvoyance in ordinary cases of embodied minds, we can sort out just what activities of disembodied minds can be grounded in powers that we know that we have, that is, in powers that are required to explain ordinary mind-brain interaction. Since embodied minds do manifest clairvoyance and PK, disembodied minds can be thought to have those same powers. In that case, disembodied minds could act, acquire new knowledge, and communicate with other minds as long as there are bodies of some sort for them to use. Bodies would not be needed for reflection on one's character and things like that, but they would be needed for activities and communication. In that respect disembodied minds would be like ordinary embodied minds, dependent on bodies of some sort to register their presence and do their deeds. It seems to me wise that the belief in re-embodiment characterizes most views of survival of bodily death, at least short of the final 'death' by reunion. Cases involving mediumistic communication have the medium's brain (speaking) and hands (writing) for disembodied spirits to use, while in apparition cases the spirit perhaps directs the perceiver's brain to produce auditory and visual hallucinations (note 3).

It is in no wise my intention to argue that Cartesian dualism is the only form of mind-body analysis that can do justice to parapsychology. Some philosophers claim that various forms of idealism would make not only the types of parapsychological powers that I have mentioned but others even more natural than dualism. I do intend to argue that physicalism could not conceivably be stretched to accommodate parapsychological powers. It might be the case that some day physicalists will discover physical correlates to parapsychological powers, as they have discovered physical correlates to ordinary sensory powers, but the content of sensations and ideas is not and never could be electrochemical.

PERSONAL IDENTITY, EMBODIED AND DISEMBODIED MINDS

Another problem that is widely supposed to be troublesome for views of disembodied existence is that of establishing the identity of a particular soul or self. In the space remaining, something will be said about this problem. It should be noted at the outset that the question of establishing the identity of disembodied persons is

closely related to the question of establishing the identity of embodied persons. Neither embodied persons nor disembodied persons can be identified directly or with certainty, on the model of mind-body being used here. The identity of a particular embodied Cartesian mind will always be subject to Cartesian doubt, and the possibility of being mistaken as to who one was is inherent in Cartesian views of self (note 4).

Suppose that a Cartesian soul has been related to a body in a quite ordinary way and then becomes unrelated to that body, perhaps through death or an out-of-body experience or even just because she for the first time realized that she is not 'in' a body after all, and she has found herself worrying whether she is the soul that used to philosophize as Gretchen Weirob (see note 5). If the body was still alive we could suggest to her that she try to re-embody herself 'in' that body, on the supposition that each body can be embodied by one-and-only-one soul. If she questions that supposition, and after all our evidence for that is merely inductive and inductive support is not very good for answering logical doubts, it will be difficult to ease her anxiety that way.

Philosophers typically suggest two criteria for establishing personal identity over time, bodily continuity and memory. Serious debate rages over which criterion is primary, and whether either separately or both together are sufficient. I will argue that neither criterion can produce certainty as to the identification of souls, and that we will have to settle for less-than-certain identifications. What I shall say shall apply equally in disembodied spirit and embodied spirit cases because in neither sort of case can memory be a sufficient criterion for identity since memories are fallible and in neither sort of case will bodily continuity work. We may always have to settle for less-than-certain identification, but this should worry us no more in disembodied spirit cases than in embodied ones.

Bodily continuity will not suffice for identification both because she is not now in a body and because it is not her body that constitutes her identity. Could we look for soul continuity? Bodily continuity has always been an appealing criterion because one can see bodies, but who can see souls? There is some (but very little) evidence from the literature of apparitions and out-of-the-body experiences that spirits can be identified through ordinary senses, and it would be difficult in a paper which attempts to build from well-established powers to appeal to poorly established powers. If it

should turn out to be the case that spirits are directly observable and that we all can observe other spirits directly when we ourselves are disembodied then one worry will be solved. Also, if it turns out that there is a God, and that God can see spirits or even see into spirits, the problem would be solved, but I would prefer not to use God to allay Cartesian doubts even though there is good historical precedent (Descartes himself) for doing so. For most of us now Descartes' proofs in the Third and Fifth Meditations do not suffice. Since the existence of God is doubtable, to appeal to God as a solution to the problem would be dubious.

How do we identify Gretchen with our ordinary powers? We are dependent on inferences from what her soul reveals about herself using her body. Inferences are fallible. We could easily be fooled by our alien soul who had seized control of her body and pretended to be Gretchen herself. We use bodily continuity as a sign of soul continuity, but it is a very fallible sign. Using ordinary powers we cannot see her soul even once, let alone verify that it is the same soul at another time. If we are restricted to ordinary powers, then, neither soul continuity nor body continuity would work.

What about appeals to memory? It is clear to most philosophers that appeals to memory to establish personal identity clearly fall short of demonstrative proof. Since there are such things as faulty memories, how could we infer from the fact that she 'remembers' being Gretchen, that she is actually Gretchen, when that 'memory' could be a pseudo-memory? A real memory is distinguished from a pseudo-memory only by whether the person who 'remembers' really did in fact do the remembered thing. To suppose her memory to be a real memory is to presuppose that she is the person who did the remembered action or who was the remembered person. Thus the memory criterion depends upon the continuity criterion. If she truly remembered, then she was the person she remembers being, but if her memory could be false, then she is not entitled to be certain that she was that person just from consulting memory. How does she check? She needs some independent criterion to check memories because memories are fallible. What could that independent criterion be? We cannot supply checks on that memory through observation of her over time as we have just noted. It would seem, then, that she could never be completely sure who she had been (that is, that she had once been the soul that was embodied in that particular body).

Suppose an hypnotically-talented graduate student who, as a thesis

project, supplies false memories to several souls in an effort to create the illusion of a debate among philosophers of different time periods. The student has in fact given the soul whose identity we (and she) are worried about pseudo-memories of Gretchen Weirob, and has given other souls pseudo-memories of Heloise, Diotima, Kuan-Yin and so on. A 'memory' identification of our soul in quandary as Gretchen Weirob would be mistaken under those circumstances.

There are things we could do to help her refine the options as to her real identity. We might be able to ascertain over time, by making inferences from her present words and 'behavior', that she lacks the sort of character Gretchen had. We could say, "you surely are mistaken, for Gretchen was characteristically abstemious while the choices you just made indicate that you are by nature apolaustic". If souls have characters, we could help her rule out certain identities, persons who she is not likely to have been, but we could not make positive identification of the unique person she was if the personal memories are mistaken. Neither could she find out as long as the erroneous memories persist. If we presume that characters also can be altered hypnotically, this method of narrowing the options would be of no use (note 6).

What if we gathered every soul together, and all bodies were accounted for by those souls except one body which no one claimed? Could we, and she, then be sure? No, for the hypnotically-talented graduate student hypothesis would prevent certainty. All the graduate student had to do was give one additional soul false memories and misidentification could have occurred.

Short of appeals to God, disembodied souls cannot ever be identified infallibly with particular bodies. Personal continuity cannot be established because no one could possibly witness that personal continuity was true, and memory needs the prior establishment of personal continuity as a criterion to distinguish between true and false memories. Does this then mean that we can never feel confident that some disembodied soul is the same soul as the one which previously was related to a particular body? No. The problem of identification of disembodied souls is the same in principle as the problem we have identifying with certainty as embodied soul, and we do not as a rule let Cartesian doubts bother us for long in cases like that any more.

How do we identify embodied souls (souls related to particular

bodies)? We have exactly the same problem. Imagine some distressed soul who wakes one morning wondering who she is and whether she is in her proper body. How could we or she be certain? She 'remembers' being in this body before, but was she? If we admit the conceptual possibility of body-switching, the problem could arise. And, what about the hypothetical hypnotically-talented graduate student? Could the graduate student have put her in relation to a body that she has been given pseudo-memories of being? For us to say, we saw this body actually doing the things she (the soul) 'remembered' doing would not even provide an infallible test. All that would show is that the graduate student had been skillful after all, for the student had successfully linked her with the body she had been given pseudo-memories of being.

Infallible identification of souls even under ordinary circumstances is not really possible. When we observe a body we are not at the same time observing a soul, we are merely observing something that a soul uses and not the soul itself. We cannot guard infallibly against the possibility that one body is animated successively by several souls, hence we cannot use bodily-continuity as a guarantor of soul-continuity. Because of the one-to-one correlation between bodies and souls that seems to hold (as a rule, and as far as we know) we take bodily continuity as an indicator of soul-continuity, but it would indicate wrongly in any case where a body switched souls.

In both disembodied soul identification and embodied soul identification we have a similar problem with certainty. If we are Cartesians, we have learned to live with that sort of uncertainty, however. We Cartesians are never certain that the ground will not open up beneath our feet just at the time we take the next step, nor that our chess opponent is not changing the positions of the pieces while tampering with our memories so that we cannot notice. We cope with those doubts by counselling reasonability and we eschew certainty, knowing, however, that a belief can be reasonable and yet mistaken. The ground could open up, and people could be made just now with false memories about having pasts, but to have these doubts in the absence of any reason to think they are true is unreasonable. Unless there are facts that indicate otherwise, we are strongly inclined to the presumption that any soul-claimant is the soul it 'remembers' itself to be. If it generally turned out to be true that embodied people frequently had delusions of being Napoleon it could even become reasonable to think that memories are not a good basis for deciding who one was, but in the absence of conditions of that sort, the

reasonable thing to do is trust the memories.

Several possible ways to go beyond this point have been suggested, but all involve supposing powers or persons not clearly grounded in ordinary mind-world relations. Telepathy could solve the problem, if it exists in the form of direct viewing into other souls. If it exists merely in the form of mind-mind communication, deception would still be possible (the graduate student hypothesis). Direct seeing of souls would solve the problem, but it is not clear that privacy of souls can be violated in that way. Also, if it were the case that souls could only animate perfectly their 'own' bodies and have only a much more superficial relation to other bodies, then we could raise Gretchen's body (or an exact duplicate) and see whether the soul who thinks she is Gretchen can really animate it again or can at best only make it flop around. It would be premature to pin one's hopes on this solution, for we have limited experience with the control of souls over bodies other than their own, but this possibility is promising in my view.

SUMMING UP

In this paper I have tried to argue against the views of such philosophers as Flew and Penelhum that there is something conceptually wrong with the notion of disembodied spirits. My main line of argument has been to show that when a correct view of the mind-brain relation is taken, there is nothing really wrong with disembodied spirits that is not wrong with embodied ones. Philosophers of that persuasion have said, "so much the worse for the concept of embodied spirits" but that answer no longer is persuasive. Thirty years of 'ordinary language' philosophy have been unsuccessful in establishing non-dualistic views of the human self.

Once dualistic views of the self are examined carefully it becomes clear that mind-body relations are paranormal and that the powers needed to relate mind and body provide a basis for concerning of mind's survival in a disembodied state. Once those dualistic views are examined carefully it becomes clear that the problems of identification of disembodied souls are not different in principle from ordinary identifications of persons.

NOTES

1. Readers interested in such an approach to the problem will find it in Antony Flew, 'The presumption of atheism' (London: Elek Books, 1976), pp 103-155 and Terence Penelhum, 'Religion and rationality' (New York: Random House, 1971), pp 331-355 and 'Survival and disembodied existence' (London: Routledge and Kegan Paul, 1970), the sources of some of the objections to disembodied souls that I have tried to answer. Both philosophers have been incurably afflicted with the disease called 'ordinary language philosophy'.

What is remarkable is that both Flew and Penelhum claim that ESP and PK are intelligible notions while suggesting no viable mechanisms by which they could occur. The only thing they seem to be sure about is that whatever these powers require it is not Cartesian minds because Cartesian minds are absurd.

2. Not all people who claim to practice science are reductionists, of course. An earlier version of this paper was read to one such group, the Parapsychology Association. I have benefitted from a number of suggestions made by members of that group.

3. There is no reason to suppose that further powers, such as telepathy, are needed in ordinary mind-world relationships. Whatever paranormal communications occur between embodied minds could be accounted for by PK (another mind modifying my brain) or clairvoyance (my mind's reading another brain). I am parsimonious enough not to multiply powers unnecessarily. Later in this paper there is opportunity to use apparitions as evidence for direct seeing of disembodied souls. It seems to me that this temptation should be rejected for a similar reason. Apparitions can be reduced to PK and clairvoyance.

It is not my intention to claim that all parapsychological powers can be grounded in these two powers, and if it should happen to be the case that direct seeing into other minds could be achieved, it would mean that minds could communicate directly with each other and that they could identify each other without having to use fallible inferences from bodily behavior. It would also be the case that such telepathy would solve the identification problem.

4. Because of the arkwardness of deciding the referent of 'I' words, the subject or the preciate of the sentence 'I am Frank Dilley', I have decided to talk about the problem as the problem of determining who one was. 'I am I' is a tautology, but 'I am Frank Dilley' is not. The latter means, I am the person who animated the Frank Dilley body, and that statement is synthetic.

5. I have borrowed Gretchen Weirob from John Perry's interesting 'Dialogue on personal identity and immortality'. I hope one day to prepare a full-scale reply to the issues he raises.

6. Just what hypnotists can or cannot do is subject to great controversy. Should someone demonstrate that they can neither produce pseudo-memories nor alter characters it would force me to change my illustration. I did not use the 'evil demon' because I am unclear that any being could directly produce changes in another's mind otherwise than by suggestion.

I have chosen to make personal memories falsifiable and characters not because the literature of reincarnation seems to suggest that characters go on while memories do not. However Stevensonian (Ian) cases do involve personal memories, and there are counterinstances in the literature of multiple personality where the same person seems to have several characters.

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THE 'LOZANOV METHOD' AS A PSI-CONDUCIVE STATE: THE EFFECT OF RELAXATION, SUGGESTION, AND MUSIC ON ESP TEST SCORES

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Sheila Ostrander and Lynn Schroeder (1970) brought to the attention of the West Dr. Georgi Lozanov, a Bulgarian medical doctor and head of the Institute of Suggestology in Sofia. He is the founder of both Suggestology, the scientific study of suggestion; and Suggestopedia, the application of suggestion to pedagogy. In their book (Ostrander and Schroeder, 1970), Lozanov is reported to have said, 'We found while using suggestology that some people became telepathic'. In 'Superlearning' (Ostrander, Schroeder, and Ostrander, 1979), he is quoted as saying that suggestology 'can improve the parapsychological performance of an individual or entire group. . . . Faculties of telepathy and clairvoyance can be cultivated and developed by suggestology'. After having read these statements, I became curious as to the particular aspect(s) of suggestology which might prove to be conducive to psi functioning.

One of the major components of suggestology is the production of a state of physical and mental relaxation. This is accomplished by having the subject listen to taped relaxation and visualization instructions. Following these instructions, a 'superlearning' session begins with the use of a particular type of classical Baroque music (60 beats/minute) (note 1), which is played while a lesson is presented. It has been suggested that 'The music-induced relaxation left the mind alert and able to concentrate' (Ostrander et al, 1979).

Since several parapsychological studies have suggested that physical and/or mental relaxation may be psi-conducive (Braud and Braud, 1973; Braud and Braud, 1974; Stanford and Mayer, 1974), the author reasoned that the relaxation aspects of suggestology could be the basis for Lozanov's claims regarding suggestology and psi performance.

Therefore, the author decided to conduct an exploratory experiment examining the effect of a relaxation and suggestion procedure, almost identical to that used in suggestopedia, on ESP test scores. Since it seemed reasonable that the relaxation/suggestion (R/S) procedure would simply enhance the demonstration of a subject's general psi ability, it was assumed that the direction of his/her scores would be dependent on various mood and psychological factors. Thus, the variance of the scores was chosen as the dependent variable. The hypothesis was that there would be a significant difference in variance between a (R/S) condition and a no (R/S) condition. The scores of the subjects in the experimental (R/S) condition varying greater from mean chance expectation than those of the control. It was also hypothesized there would be a significant difference in the mean scores of reported degree of relaxation, between the two conditions. The experimental reporting a higher degree of relaxation than the control.

METHOD

Subjects

The subjects consisted of 40 individuals, 25 females and 15 males, ranging in age from approximately 8 to 45 years. They were all nonpaid volunteers who showed an interest in having their ESP tested through the use of a PET computer. All but a few were either students or staff at John F. Kennedy University. There were 18 subjects in each of the two conditions. Due to problems with obtaining a printout of their scores, insufficient data were recorded for 3 subjects. The data from the last subject tested was not used so that there could be an even number of subjects in each condition.

Apparatus and materials

The major piece of equipment consisted of a Commodore PET Computer 2001, which had a thermal printer, memory board, and added power supply attached to it. The software consisted of a forced-choice ESP game which was developed by John Palmer. The random numbers required for the program were generated by the PET's internal random number generator. These sequences were checked for randomness by computing a chi-square on the data for each subject. During this experiment, the clairvoyant and total feedback options of the program were automatically given to all subjects. The relaxation and suggestion tape, including the classical music, was taken from Superlearning Inc. (note 2), but was modified to fit the experimental situation (see appendix A). The state-report questionnaire contained 8 items taken from Braud and Braud (1974). Items 9 and 10 were used to get a report of the subject's degree of relaxation before the relaxation procedure began and were only given to subjects in the experimental condition. A semi-acoustically shielded room was used during the relaxation and testing periods in order to provide a distraction free environment.

PROCEDURE

The experiment was carried out over a period of 24 days at John F. Kennedy University's Parapsychology Laboratory. Each subject was greeted at the lab by the experimenter and immediately thereafter was asked to call the toss of a coin. It was previously decided that if the subject guessed correctly s/he would be assigned to the experimental condition. Incorrect guessers were assigned to the control condition. Subjects were informed of the purpose of this procedure following the testing period.

Once the subject was assigned to a condition, s/he was given a Consent Form to read and sign. The Consent Form also served the purpose of informing each subject what was involved in his/her participation. Subjects in the control condition were also given the state-report questionnaire at this time (see appendix B).

Next, each subject was led into the semi-acoustically shielded room. Inside the room were: the PET computer with attachments, tape recorder, and a small lamp (which were on a table), a bed and a

reclining chair. Subjects in the experimental condition were given the choice to either lie on the bed or sit in the chair while they listened to the relaxation tape. The experimenter informed them that the tape was to run for approximately 20 minutes and at the end of it they would be asked to knock on the door of the room. At this time, the experimenter would give them a questionnaire to complete. These subjects were also told that they would get to play the ESP game immediately after the completion of the questionnaire.

The subjects in the control condition were simply seated in the chair, given instruction for playing the game, and left alone during the test period. Each subject was told that, prior to each trial, the computer would randomly choose one of the numbers 1 through 5, which were displayed on the video screen. Subjects were asked to press the number on the keyboard which they thought corresponded to the number chosen by the computer. They were also told that, immediately following their choice, a solid white bar would descend over the correct number. It was stated that the number appearing on the lower, left-hand side of the screen was the trial number while the number on the lower right was their number of hits up to that trial.

Each subject performed 4 runs of 25 trials each. At the end of each run, subjects were required to press the number 1 in order to start the next run. They were told that at the end of the fourth run they were to stop guessing and knock on the door. After a few subjects were run, it became apparent it was difficult for them to remember how many runs they had completed. In order to correct this, they were asked to record the number of completed runs on a piece of paper.

The testing procedure for subjects in the experimental condition was identical, with the exception that classical music was played during the course of the test period. Upon completion of the test period, each subject was debriefed and given the details of the entire experiment. They were allowed to view the printout of their results and were informed that their individual and overall results would be made available on request. Finally, each subject was thanked for their participation and asked not to discuss the experiment with prospective subjects.

RESULTS

The hypothesis that there would be a significant difference in the variance between the experimental and control conditions was not confirmed by the experimental data ($F(17,17)=1.27$, n.s.). The variance for the experimental condition was 25.12 while that of the control was 19.81. There were, however, significant differences in the mean scores of both reported mental ($z=-3.12$) and physical ($z=-3.15$) relaxation between the two conditions, as computed by the Mann-Whitney U Test. The means for mental relaxation were 4.50 ($s=2.20$) for the control condition and 2.50 ($s=1.46$) for the experimental. The means for physical relaxation were 3.72 ($s=1.90$) control and 2.05 ($s=0.87$) experimental (low scores indicated a high degree of relaxation).

The overall results produced a CR=0.46, p=n.s., and the difference in mean hits between conditions produced a $t(34)=1.78$, p=n.s.. Individual means for the control and experimental were 20.94 and 19.66 respectively. Several post hoc analyses were conducted, including correlations between state-report questionnaire items and ESP scores, but none were found to be significant.

DISCUSSION

The results of this experiment seem to suggest the relaxation and suggestion procedure had no effect on the subject's ESP performance. This finding appears to be in conflict with the results of other studies, which have consistently obtained overall psi hitting using similar relaxation procedures (Palmer, 1978). The majority of these studies, however, used a free-response ESP test. Palmer (1978) notes that the only experiment in which progressive relaxation was used in conjunction with a forced-choice test resulted in chance scoring in runs preceded by the relaxation procedure (Sandford and Keil, 1975). This study also obtained significant above chance scoring on control runs. In the present study, subjects in the control condition scored slightly above chance, while those in the experimental scored slightly below. This may suggest that these types of relaxation procedures differ in their effect upon ESP scores, in accordance with the type of test procedure. Further studies are needed to confirm or refute this hypothesis.

Another major difference between the present study and the above mentioned is the fact that music was played during the experimental condition test period. Habel (1975) compared the effect of 3 different auditory stimuli in the Ganzfeld, one consisting of a classical piece of music (Ravel's 'Bolero'), yet there was no significant difference in scoring between the conditions. One flaw with the present experimental design is the fact that no attempt was made to measure the specific effect of the music. The experimenter did ask the majority of the subjects, however, if the music was bothersome, and only 2 subjects complained about it. Most of the subjects reported that it had a very soothing effect, so it is the author's opinion that the music was not a confounding factor. Again, further research is needed to determine its actual effect.

One factor which could have had an overriding effect was the fact that the forced-choice testing procedure required subjects to interact with a computer. The experimenter noted that many subjects, particularly those who scored near chance, reported difficulty in 'relating' to a machine. It was also noted that subjects reported playing 'mind games' with the computer. This seems to indicate that many of the subjects in both groups were using 'action mode/left hemispheric functioning' which Braud (1975) suggests decreases psi performance. Perhaps the inclusion of an acclimation period in future studies would improve the results.

Another factor that should be considered is that, although this study was a preliminary attempt to discover the basis for some of the claims of suggestology, it fell far short of incorporating in design many of the essential ingredients of 'The Lozanov Method' as described by Bancroft (1976) and Racle (1976).

In conclusion, the author feels obligated to mention that, although it seems plausible to him that mental and physical relaxation procedures may be psi-conducive, he does hold personal beliefs that this may not prove to be a universal constant. Thus, the results of this experiment may have been influenced by the experimenter's beliefs.

ABSTRACT

An exploratory experiment comparing the effect of a particular

relaxation/suggestion (R/S) procedure versus no (R/S) was conducted in an effort to determine if the (R/S) component of suggestology is responsible for the claim that this discipline may be psi-conducive. Subjects consisted of 25 females and 15 males, ranging in approximate age from 8 to 45 years, and were randomly assigned and evenly divided in a between-subjects design. The ESP task was to correctly guess a number, 1 through 5, which was randomly chosen by a PET computer. Subjects in the experimental condition listened to a relaxation and suggestion tape prior to the test period, during which a particular type of classical Baroque music was played. Subjects in the control condition were simply given the ESP test. All subjects completed a state-report questionnaire immediately before the ESP test in order to determine their degree of relaxation and beliefs concerning the test situation. The predicted difference in variance among ESP scores between conditions was nonsignificant, although there was a significant difference in reported mental and physical relaxation between conditions. No significant correlations were found between ESP scores and state-report questionnaire items. A possible difference in effect for relaxation procedures on forced-choice versus free-response test performance, as well as other possible confounding variables, were discussed as interpretations of the data.

NOTES

1) Seventeen minutes of specially selected slow music to aid relaxation, learning and mind/body harmony. Moss Music Group, Inc., 1979.

2) Exercise Cycle Cassette Tape: Body/Mind Relaxation: Mind Calming: Joy of Learning. Superlearning, Inc., 1979.

REFERENCES

Bancroft, W.J. 'Suggestology and Suggestopedia: The theory of the Lozanov method', Journal of suggestive-accelerative learning and teaching, 1976, 1, 187-216.

Braud, W.G. and Braud, L.W. 'Preliminary explorations of psi-conducive states: Progressive muscular relaxation', J. A.S.P.R., 1973, 67, 26-46.

Braud, L.W. and Braud, W.G. 'Further studies of relaxation as a psi-conducive state', J. A.S.P.R., 1974, 68, 229-245.

Braud, W.G. 'Psi-conducive states', Journal of Communication, 1975, 25, 142-152.

Habel, M.M. 'Varying auditory stimuli in the Ganzfeld: The influence of sex and overcrowding on psi performance', Research in parapsychology 1975, Metuchen, Scarecrow Press, 1976, 181-184.

Ostrander, S. and Schroeder, L. 'Psychic discoveries behind the iron curtain', Englewood Cliffs, Prentice Hall, 1970, 275-309.

Ostrander, S., Schroeder, L. and Ostrander, N. 'Superlearning', New York, Delcorte Press and The Confucian Press, 1979.

Palmer, J. 'Extrasensory perception: Research findings', in Krippner, S. (ed), Advances in parapsychological research, Vol 2, New York, Plenum Press, 1978, 113-120.

Racle G. 'The key principles of suggestopaedia', Journal of suggestive-accelerative learning and teaching, 1976, 1, 149-160.

Sanford, J. and Keil, H.H.J. 'The effect of 'normal' versus relaxed states of consciousness on ESP scoring using a GESP feedback testing device', in Morris et al (eds), Research in parapsychology 1974, Metuchen, Scarecrow Press, 1975, 24-27.

Stanford, R.G. and Mayer, B. 'Relaxation as a psi-conducive state: A replication and exploration of parameters.', J. A.S.P.R., 1974, 68,

182-191.

APPENDIX A
Addition to 'Superlearning' tape

You are about to learn how to play a game in which you will use your ESP to determine what target number our PET computer has randomly chosen. As you may know, parapsychologists, in general, feel that everyone has the ability to demonstrate ESP ability. During this game, you will have the opportunity to demonstrate your ESP ability. It is also generally believed that ESP ability can be trained to a certain extent. During the game, when you make a correct guess, you may try to notice any internal, mental or physical sensations that correspond to your successful guesses. This may help you in making future guesses. Always keep in mind that this is a game, have fun, and do not get discouraged if it appears you are not doing well. It only takes a small number of overall correct guesses to successfully demonstrate ESP ability. Now, knock on the chamber door, and the experimenter will be with you shortly to explain how to play the game.

APPENDIX B
State-report questionnaire

PLEASE CIRCLE THE APPROPRIATE NUMBER

Do you believe in ESP?
VERY STRONGLY 1 2 3 4 5 6 7 8 9 10 NOT AT ALL

Do you believe that scoring greater than chance (good scoring due to good ESP) can occur in an experiment such as the one you are now participating in?
VERY STRONGLY 1 2 3 4 5 6 7 8 9 10 NOT AT ALL

Do you believe that you will score above chance in this experiment?
VERY STRONGLY 1 2 3 4 5 6 7 8 9 10 NOT AT ALL

How is your mood today?
ECSTATIC 1 2 3 4 5 6 7 8 9 10 DEPRESSED

To what extent are you in the mood to participate in this ESP experiment?
VERY MUCH 1 2 3 4 5 6 7 8 9 10 VERY LITTLE

Rate your attitude or feelings concerning the experimenter in this experiment.
LIKE 1 2 3 4 5 6 7 8 9 10 DISLIKE

Describe your physical state right now, at this very moment.
RELAXED 1 2 3 4 5 6 7 8 9 10 TENSE

Describe your mental state right now, at this very moment.
RELAXED 1 2 3 4 5 6 7 8 9 10 TENSE

Describe your physical state before the relaxation procedure began.
RELAXED 1 2 3 4 5 6 7 8 9 10 TENSE

Describe your mental state before the relaxation procedure began.
RELAXED 1 2 3 4 5 6 7 8 9 10 TENSE

FOUNDATIONS FOR A PHYSICAL MODEL OF PSYCHIC PHENOMENA

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The need for scientific revolutions

In recent years, science has seen a number of 'revolutions' that have radically changed and sometimes upset theoretical science. This is fortunate because without scientific revolutions, science would cease to evolve. Historically, these revolutions occur within a scientific discipline when unexplainable anomalies become increasingly apparent. With the emergence of new theories to explain such anomalies, a revolutionary struggle begins between the old and the new theoretical models. After the crucial scientific debates and experiments are over, there is generally victory for one theory and the scientific discipline returns to equilibrium until experimentation and observation reveal additional unexplainable anomalies (Kuhn, 1970).

History records many incidences of persons who have experienced and/or witnessed 'psychic anomalies' (Prince, 1963). In recent years, there has been considerable scientific discussion and increasing controversy about these anomalies. With the report of scientific experiments and observations of these anomalies, a number of generalizations and theoretical mechanisms and models are being suggested; leading, perhaps, to another scientific revolution.

Psychic phenomena and coincidences

A particularly interesting and subtle group of psychic anomalies are those commonly referred to as 'coincidences'. Interest and speculation as to the nature and meaning of these anomalies is as old as recorded history (Jung, 1969).

In 1919, Paul Kammerer's 'Das Gesetz der Serie' was published. In it he attempted to classify coincidental series of events into a taxonomic-like key and theorized that there is a universal, acausal connecting principle that is coexistent with the principle of causality. This book also contains one hundred personal examples of coincidences taken from his life-long diary of coincidental experiences. Kammerer defines a 'serie' as "a lawful recurrence of the same or similar things and events - a recurrence, or clustering, in time or space whereby the individual members in the sequence - as far as can be ascertained by careful analysis are not connected by the same active cause" (Kammerer, 1919, p. 36). He concludes his book by stating that seriality is "ubiquitous and continuous in life, nature and cosmos. It is the umbilical cord that connects thought, feeling, science and art with the womb of the universe which gave birth to them" (p. 456). Although Kammerer's book attracted little attention, Albert Einstein commented favorably about it, stating that it is "original and by no means absurd" (Przibram, 1926).

In 1952, Carl Jung, in collaboration with Wolfgang Pauli, published an essay entitled 'Naturerklarung und Psyche'. In this essay, they proposed a theory of synchronicity where the noncausal events of microphysics, i.e., quantum physics, are extended to macrophysics. Jung defines 'synchronistic events' as those that "rest on the simultaneous occurrence of two different psychic states. One of them is the normal, probable state and the other, the critical experience, is the one that cannot be derived causally from the first" (Jung, 1960, p. 444).

Although Kammerer's 'seriality' and Jung's 'synchronicity' are quite similar, both deal with different types of coincidental psychic anomalies. Kammerer's 'seriality' being a recurrence of the same or similar things and events in space of time; and, Jung's 'synchronicity' being the simultaneous occurrence of two or more causally unrelated events. (It should be noted, however, that Jung classified precognitive dreams as synchronistic phenomena.)

Unfortunately, much of the current literature dealing with coincidental type anomalies misuse the words 'seriality' and 'synchronicity' by using them interchangeably as though they were synonymous.

Cycles and biological relativity

Many types of psychic anomalies can be thought of and studied as a kind of cyclic phenomena. Some sensitives and psychics have their runs of hits, just as some gamblers have their 'lucky days'. The analysis of careful records often shows a periodicity or clustering effect for certain types of psychic phenomena. The Rhines have termed this the 'decline effect' or the 'scoring-decline effect' (Rhine, 1964 and Rhine, 1970). It seems that periodic or cyclic phenomena are characteristic of nature (Lotka, 1956; Nicolis and Prigogine, 1977). In recent years, there has been a great deal of interest and investigation into biological rhythms, especially bio-behavioral rhythms (Luce, 1970).

With the invention of the first kymograph in 1847 by Carl Friedrich Ludwig, the study of rhythmic phenomena in biological systems began. In 1875, Etienne Jules Marey casually noted that his physiographic recordings were asymmetric, with the descending slope longer than the steeper ascending limb of the graph. This was the first generalization of biorhythmic phenomena.

As the amount of literature available on cyclic or rhythmic phenomena in the biological sciences accumulated, some mathematical generalizations appeared (Cronin, 1977; Grigg, 1967, and Llaurado, 1972). E.R.N. Grigg introduced and developed the theory of biologic relativity. According to this theory, all charts, curves, and graphs of biological phenomena have a basic universal pattern. Graphically, this 'primordial pattern' can be described as a curve with a shorter ascending limb than descending limb; time is on the X-axis, and the stimulus is at the origin of the coordinates. This concept of the primordial pattern is a unifying concept to the life sciences in that it generalizes how a biological entity or biological system will respond to a stimulus. Biologic relativity also expounds the position-report (the phase of the response at the moment under consideration) and offers the concept of biologic age (the position-report of a population on the growth-rate curve for that

population).

An exhaustive search of the biological literature revealed no exceptions to the primordial pattern (Schlesinger, 1971). More recently, the concept of the primordial pattern has been extended to the social sciences (Brittain, 1971) and to jurimetrics (Schlesinger, 1979). If the mathematical analysis of psychic phenomena reveals the primordial pattern, mathematical and cybernetic models of psychic phenomena can be developed and incorporated into biologic relativity, thereby offering a unified model of bio-behavioral phenomena. These models will be useful in the physical modelling of, inter alia, psychic phenomena and in predicting the course of such event(s), by computing the mathematical course of the primordial pattern from the position-report (Grigg, 1967; Llaurado, 1972). These models may also be useful in revealing how a system can be manipulated in order to regulate the primordial pattern, thereby controlling (by extending or by shortening) the course of the event(s). (The concept of the primordial pattern is useful in prognosing the course of disease (Grigg, 1967) and may someday be useful in controlling it by manipulation of the biological system to alter the primordial pattern, thereby altering the course of the disease.)

Mathematical and cybernetic models of the primordial pattern

Heretofore, few mathematical and cybernetic treatments of the primordial pattern have appeared. E.R.N. Grigg's (1967) mathematical representation of the primordial pattern is as follows:

$$x = ate^{(-bt)}$$

where :

- x is the dependent variable in whatever dimensions the response is being measured;
- t is the independent variable, always with the dimension of time;
- e is the base of the natural logarithms;
- a is a parameter which has the dimensions of x divided by time; and
- b is a parameter which has the dimension of the reciprocal of time. This parameter is always a positive number.

Grigg's representation is a useful and accurate mathematical model of the primordial pattern, just as the power series:

$$x = a_0 t^n + a_1 t^{n-1} + a_2 t^{n-2} + \ldots + a_{n-1} t + a_n$$

would also be a useful and accurate mathematical representation of it. But, Grigg's mathematical representation does not reveal any close interconnection between the biological phenomena and the physical world.

Josef Llaurado (1972) developed a cybernetic model of the primordial pattern using a second-order damped system representable by a differential equation with zero initial 'displacement' and some initial 'velocity':

$$\ddot{x} + D\dot{x} + Ex = 0 \qquad \begin{matrix} x(0) = 0 \\ \dot{x}(0) \neq 0 \end{matrix}$$

where:

D is related to the resistive or frictional component; and

E is related to the elastic component.

An inertial component does not appear explicitly in Llaurado's model, but it is implicitly contained in it. (I.e., inertial force = elastic force + resistive force; $F_a = F_e + F_d$

$m\, d^2s/dt^2 = -ks - b\, ds/dt$ $\qquad \ddot{s} + b/m\, \dot{s} + k/m\, s = 0$

the equivalent of Llaurado's mathematical representation.) Llaurado's model involves three types of forces (or analogous entities): inertial force, elastic force, and resistive force. This model not only serves as an accurate method of mathematically generating the primordial pattern, but it also illustrates the close interconnection between the biological phenomenon (represented by the primordial pattern) and the physical world. Llaurado's model of the primordial pattern goes to the very core of biological relativity in that it has the characteristic of irreversibility.

S.Z. Cardon and A. Iberall (1970) suggested that oscillations with a deterministic, non-linear causality exist in all biological systems and that these oscillations are cooperative and linked within the different levels and between all the levels of the system. Perhaps, there is a definite interconnection between those oscillations of the readily observable biological responses and those of the more subtle

psychic anomalies.

The need for a physical model of coincidental psychic phenomena

Perhaps at the root of most all psychic phenomena is the serial or synchronistic experience. These anomalies, however, may be among the most difficult to model and explain physically. Perhaps if this basic problem were resolved, it would provide psychotronics with a foundation and a core of axioms to work with and build upon.

The author of this paper is not aware of any feasible mechanisms or models whereby the time-related psychic phenomena (e.g., precognition, seriality, and synchronicity) can be physically explained. The need for a model of the time-related psychic phenomena is of primordial importance to psychotronics because time itself can be thought of as the most primordial or fundamental of 'dimensions'. (Even though time is generally referred to as the '4th dimension', it can be referred to as the '0th dimension' for many purposes.)

Conclusion

The serial and the synchronistic types of time-related psychic phenomena may be at the core of the modus operandi of many types of psychic phenomena. Because these 'cyclic' (time-related), psychic phenomena can be described and recorded with curves and graphs, biological relativity may be valuable in their mathematical/cybernetic modelling and generalization.

Biological relativity should also be valuable in developing physical models of psychic phenomena; particularly any unified model or theory involving 'cyclic' (time-related), psychic phenomena, the most primordial, subtle, and heretofore difficult to model.

REFERENCES

Brittain, R.D. 'Universal relativity: A concept unifying physical and biological relativityy', A paper presented at the Second Symposium on

Biological Relativity, 138th annual meeting of the American Association for the Advancement of Science, 1971.

Cardon, S.Z. and Iberall, A.S. 'Oscillations in biological systems', Currents in Modern Biology, 1970, 3, 3, 237-249.

Cronin, J. 'Some mathematics of biological oscillations', SIAM Review, 1977, 19, 1, 100-138.

Grigg, E.R.N. 'Biological relativity', Chicago, Amaranth Books, 1967.

Jung, C.G. 'The structure and dynamics of the psyche' (Collected Works of C.G. Jung, VIII), London, R.F.C. Hull, 1960.

Jung, C.G. 'Forerunners of the idea of synchronicity', (Chapter 3, pp. 69-88), In Jung, C.G. 'Synchronicity: An acausal connecting principle', Princeton, Princeton University Press, 1969.

Jung, C.G. and Pauli, W. 'Naturerklarung und Psyche', (Studien aus dem C.G. Jung Institut, IV), Zurich, C.G. Jung Institut, 1952.

Kammerer, P. 'Das Gesetz der Serie', Stuttgart, Deutsche Verlags Anstalt, 1919.

Kuhn, T.S. 'The structure of scientific revolutions', Chicago, University of Chicago Press, 1970 (2nd edition).

Llaurado, J.G. 'The physico-mathematical substrata of biologic relativity', Kybernetics, 1972, 1, 175-190.

Lotka, A.J. 'Elements of mathematical biology', New York, Dover Publications, 1956, originally published in 1924, under the title 'Elements of physical biology'.

Luce, G.G. 'Biological rhythms in psychiatry and medicine', Chevy Chase, MD, National Institute of Mental Health, 1970.

Ludwig, C.F. 'Beitrage zur Kenntniss des Einflusses der Respirationsbewegungen auf den Blutlauf im Aortensystems', Archiven auf Anatomie und Physiologie, 1847, 242-302.

Marey, E.J. 'Memoire sur la pulsation du coeur', Physiologie Experimentale, 1875, 1, 19-85.

Nicolis, G. and Prigogine, I. 'Self-organization in non-equilibrium systems', New York, John Wiley and Sons, 1977.

Prince, W.F. 'Noted witnesses for psychic occurrences', New Hyde Park, NY, University Books, 1963.

Przibram, H. 'Paul Kammerer als biologie', Monistische Monatshefte, November 1926.

Rhine, J.B. 'Extrasensory perception', Somerville, MA, Bruce Humphries, Publishers, 1964.

Rhine, L.E. 'Mind over matter, psychokinesis', New York, The Macmillan Company, 1970.

Schlesinger, R.N. 'Search for an exception to the primordial pattern', A paper presented at the Second Symposium on Biologic Relativity, 138th annual meeting of the American Association for the Advancement of Science, 1971.

Schlesinger, R.N. 'Applications of biologic relativity to decision-making and policy-formulation in the criminal justice system', submitted for publication.

APPENDIX

SEARCH FOR AN EXCEPTION TO THE PRIMORDIAL PATTERN

Robert N. Schlesinger

The principle of biological relativity is worthy of serious consideration. This principle is a significant contribution to biological science in that it offers the concept of the primordial pattern, which helps to unify our understanding of how a biological entity or a biological system will respond to a stimulus. (The primordial pattern is an asymmetric curve with a shorter ascending limb than descending limb; time is on the X-axis and the response is on the Y-axis.) Also, biologic relativity expounds the position-report (the phase of the response at the moment under consideration) and offers the concept of biological age (the position-report of a population on the growth-rate curve for that population). It is believed that the principles of biologic relativity are universal (Grigg, E.R.N. 'Biologic Relativity', Chicago, Amaranth Books, 1967).

Consequently, the author has made a systematic search of the biological literature in an attempt to find an exception to the primordial pattern. There are several reasons why this search was made; they are:

1) to determine whether the primordial pattern is universal (in

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Summary of a paper presented at the 138th meeting of the American Association for the Advancement of Science, Symposium on Biologic Relativity.

the set of biological literature reviewed),
2) to determine which biological responses do not follow the primordial pattern, and
3) to discover an exception(s) to the primordial pattern so that this exception can be studied in order to determine why it does not follow the pattern that (most?) every biological response follows.

The literature cited in 'Biological Abstracts' through 1970 under the subject headings: Chart, Curve, and Graph was carefully examined for possible exceptions and unusual examples of the primordial pattern. Of over 2,000 references examined, no exceptions to the primordial pattern were found.

This method for systematically scanning the biological literature has a number of advantages:

1) It deals with the biological literature that is primarily concerned with and particularly strong in charts, curves, and/or graphs. Also, it should be noted that prior to 1926, when volume one of 'Biological Abstracts' was published, the graphic recordings of biological responses were relatively crude and almost entirely of a general biological nature.
2) It provides for a coverage of the complete spectrum of the bio-medical sciences.
3) Particularly interesting examples of the primordial pattern can be noted while searching through the literature for exceptions. (Several of these examples will be shown during the author's presentation.)

Anyone desiring to continue the search for an exception to the primordial pattern might examine the literature cited under: Effect, Pattern, Recovery, Response, and Time in 'Biological Abstracts'. (The author is presently using 'Biological Abstracts' and 'Psychological Abstracts' to collect examples of the primordial pattern from the behavioral sciences.)

The principle of biologic relativity is a relatively young concept and still has some significant issues to analyze and resolve. An obvious issue is: just what exactly is a 'biologic' response? Biologic responses can (or will) be explained biochemically and/or biophysically. Do all biochemical and biophysical responses follow the primordial pattern? Which biochemical and/or biophysical responses follow the primordial pattern and which do not? Perhaps, this may lead

us to an exception and a better understanding as to why (most?) all biological responses follow the primordial pattern. Perhaps, if bio-medical science can determine why biological entities and biological systems respond to a stimulus by following the primordial pattern, we may then be able to regulate or alter the primordial pattern; in disease, for example. Also, biologic relativity aids us in prognosing the response of a biological entity or biological system to a stimulus. Thus, the principle of biologic relativity should be particularly useful to those in the bio-medical sciences.

The principle of biologic relativity has a great deal of promise, and it is urged that science writers as well as scientists attend this symposium.

AN OVERVIEW OF DETAILS OF PUBLISHED GANZFELD STUDIES

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One of the major developments in experimental parapsychology in the last decade has been the relatively rapid replacement of the traditional forced-choice research technique by free-response methods. In particular the combination of free-response methods and the application of the Ganzfeld technique, a technique to create perceptual isolation of the subject with a concommitant change of state of consciousness, has attracted much attention. Undoubtedly the main reason for the current interest in this type of research is the high rate of success in terms of psi scoring claimed for this method. According to the most recent analysis available (Blackmore, 1980) 25 of the 50 published and unpublished Ganzfeld studies carried out since the first was published in 1974 yielded a significant result: an unprecedented rate of success of 50%.

Since Ganzfeld studies are so much in the focus of interest it seemed useful to provide an overview of details of published Ganzfeld studies. This overview is not intended as a critical appraisal of the experiments reported or of the conclusions drawn from them but rather serves a practical purpose. It provides data on how these studies were carried out and how the variables inherent in the experimental situation of Ganzfeld studies were operationalized. Hence the overview can be useful in several ways. It can be used when designing a Ganzfeld study as a 'reference' list of variables which one has to decide in advance how to operationalize and it provides the

information on how these variables have been operationalized by those who carried out such studies. It also gives a list of independent variables studied in these experiments as well as a discussion of potential 'problems' of which one should be aware when designing a Ganzfeld experiment. This overview, however, does not present the conclusions drawn by the authors from their experiments because the interpretation of experimental data is partly of a subjective nature. For this the reader should study the original publications. The data reported in this overview are based on the available publications and in no instance is additional information from other sources such as personal communications included. Hence this overview also provides an indication of how complete the details of various Ganzfeld reports are. When making such a comparison it should be borne in mind, however, that for some experiments no full reports are available.

ASPECTS OF GANZFELD STUDIES

In a Ganzfeld study a homogeneous visual field is created by placing halves of ping-pong balls over the subject's eyes and a more or less homogeneous auditory input is achieved by presenting the subject white noise delivered through earphones. The main senses are thus provided with a constant and unpatterned input which in general results in a diminished contact of the subject with the external environment and an increased sensitivity for internal processes. Both the reduction of sensory 'noise' and a shift of attention to internal experiences are supposed to be enhancive of psi.

The Ganzfeld isolation tends to evoke hypnagogic-like imagery and feelings which makes it well suited for combination with free-response psi measurement techniques. In fact, the Ganzfeld isolation and free-response techniques are so closely related that the term 'Ganzfeld study' is always understood as being a free-response psi study. Because of the application of free-response techniques and the time needed for the subject to adapt to the Ganzfeld isolation, Ganzfeld studies are relatively time consuming. A session including the introduction, instructions to the subject (and agent), the Ganzfeld period, the judging of the rate of correspondence between mentation and possible targets, and the discussion of the results with the subject after the trial has been completed can easily take one to two hours, all these efforts resulting in one trial. Thus, it is no surprise that Ganzfeld studies are characterized by a relatively low

number of trials. On the other hand, since both the targets and the responses - the mentation as reported by the subject - are much richer in content than in forced-choice experiments the potential information per trial in Ganzfeld studies is much higher than that in forced-choice studies. Unfortunately, few Ganzfeld studies seem to take advantage of this.

A Ganzfeld session is usually preceded by an introductory session in which the percipient (and agent) are familiarized with the idea of Ganzfeld isolation. It is unavoidable that with unexperienced subjects such an introduction will create certain expectations as regards the possible effects of the Ganzfeld isolation. While such expectations might enhance the effect of the sensory isolation, they might also strengthen the effect of response bias when state reports or questionnaire data related to their experiences are elicited.

In some instances either as part of the introduction period or in the beginning of the Ganzfeld session relaxation techniques are applied. When such techniques are applied during the Ganzfeld session, the instructions are usually presented to the percipient via the earphones. Often one tape is used which contains instructions, suggestions for attaining a relaxed state, and white noise for the Ganzfeld session proper. A positive aspect of such procedure is that it ensures standardization of sessions over subjects. A disadvantage is that it neglects the unavoidable differences between subjects whose time to adapt to the Ganzfeld and to produce a hypnagogic-type of imagery vary.

As stated above the visual isolation in the Ganzfeld is created by putting halves of ping-pong balls over the subject's eyes. The subject is seated as comfortably as the available means allow and usually a lamp of a certain color is placed in front of the subject's face to create a uniform colored and unpatterned visual field. When in the Ganzfeld the percipient usually gives a more or less continuous verbal report about his ongoing mentation and feelings. These reports are often written down by an experimenter who is either situated in the percipient's room or who has auditory contact with the percipient by means of an intercom system. Occasionally percipients have also been required to provide verbal state reports during the Ganzfeld. It can be assumed that all this verbal behavior will have a certain disruptive effect on the subject, and thus minimizes the intended effects of the Ganzfeld isolation. On the other hand without such reports one has to rely solely on the memory of the percipient and

especially in long sessions such recollections might be a very poor reflection of the actual experiences of the subject. Indeed, without mentation data a free-response study is merely a very complicated and elaborate way of running a small forced-choice study.

The basic idea behind psi Ganzfeld studies is that the inner experiences of the percipient will have some relation to the target for that trial. Most Ganzfeld studies involve a GESP design, that is, in a certain period during the Ganzfeld session an agent views the target. Often the target pool (all targets available for use in the study) is split up into target sets, each set containing an equal number of target pictures. Selecting a target for a trial therefore often involves first selecting a target set, and then selecting from that target set one picture as the target. Most target pools consist of pictures or slides which are not further described in the publications, apart from occasional remarks that the targets were 'art' pictures or viewmaster reels, and that the pictures for each target set were selected in such a way as to make the pictures within each set as different as possible. One notable exception is the BTP (Binary Target Pool), a target pool without fixed target sets in which each target is characterized by a unique combination of 10 (extant or non-extant) aspects. Hence the total pool consists of 2 to the 10th power (1024) targets. Applying the BTP makes it possible to treat a free-response trial as if it were a forced-choice test of 10 trials, by requiring the percipient to code the mentation as regards containing or not containing the same aspects. Hence one free-response trial can be considered as 10 trials (one for each aspect) in which the probability that the mentation corresponds to the target is 1 in 2 for each aspect.

In order to simplify the evaluation for non-BTP target pools the percipient (or occasionally an external judge) is required to judge the correspondence between the mentation and a limited set of possible targets including the actual target for that trial. The limited set of possible targets is often the target set from which the target was selected, but that is not necessary. Given a target set of n pictures, the probability for a hit becomes 1 in n, entirely dependent on the arbitrary size of the target set. In this way the free-response technique is reduced to a forced-choice technique in order to be able to profit from the simplicity of evaluation which characterizes the forced-choice techniques. Usually the judging procedure involves rank ordering all pictures of the target set according to their correspondence to the mentation. Various statistical analyses are

possible after such rank orderings are obtained, based on the rank orderings themselves, the number of direct hits (first place only), hits (target is ranked in the upper half), etc.. Other judging procedures apply scaling techniques in which each picture is rated on a scale as regards correspondence to the mentation and sometimes each picture is rated on a scale as regards correspondence with each item of mentation. From such scaling procedures rank orderings can also be derived. All these techniques involve comparing the mentation with a limited set of possible target pictures. However, although with these judging procedures the evaluation of the free-response data is simplified to an evaluation of the forced-choice type, there remains an important difference in that a hit in a free-response study is generally based on a number of correspondences between target and mentation. Since the probability for a hit in these types of evaluation depends only on the number of pictures in the target set, the amount of correspondence observed between mentation and target has no influence on the evaluation. Consequently one should be aware that the statistical evaluations are but a poor reflection of the free-response nature of these studies.

Although in few Ganzfeld studies have control groups been included to measure the effect of the Ganzfeld isolation on the psi scoring, in most studies other variables have been measured. In this overview I have distinguished the variables which were systematically manipulated in a study from those which were not manipulated but measured over all subjects (usually personality variables) and correlated with the psi scores. In evaluating the results of the latter type of analyses one should take into account that, on the one hand, in most instances the psi scores are based on only one trial, while on the other hand the measurements of the variables (imagery, state-reports, personality variables) often are based on (self-made) questionnaires or scales which have never been subjected to a proper scale analysis technique or evaluated in some other acceptable way.

PROBLEM AREAS AND POTENTIAL SOURCES OF ERROR

In this section I will describe some aspects of Ganzfeld studies which need attention in order to avoid erroneous results. The points presented here do not constitute an exhaustive list of problems and sources of error, only the main ones typical for Ganzfeld studies are discussed. Not mentioned are the 'normal' precautions to be taken in

psi research and with which most researchers will be familiar. More detailed discussions on statistical problems and other issues related to applying free-response techniques can be found in Burdick and Kelly (1977), Kennedy (1979a), Honorton (1979), and Kennedy (1979b). Also, since this paper is intended as an overview I will merely signal the problems and not offer specific solutions to them. It often depends on the aim of the study, the available resources and the preferences of the experimenter which solution is practical for a given situation.

Small number of trials

It is my impression that in general the possible negative effects of the small number of trials in Ganzfeld studies is underestimated. As stated above, Ganzfeld studies are frequently evaluated as forced-choice studies. From forced-choice studies we know that one has to be careful when evaluating an experiment of for instance one run (25 trials, p=1/5). The distribution is skewed, the continuity correction exerts a relatively large influence, and especially the randomization of the targets becomes a problem considering the always present response bias. The same holds true for most Ganzfeld studies. Since targets in Ganzfeld studies are much richer in content than for instance Zener cards, stronger zero-order response bias (difference in preference for targets) than is observed in forced-choice tests might be expected. On the other hand the familiar higher-order response bias (the sequential dependencies) are of no consequence since there is only one trial per subject or, in the case there are more trials per subject, experimenters generally take care that for these trials different target sets are used.

The effect of zero-order response bias could be reduced by balancing the targets over the experiment (comparable to the use of closed decks in forced-choice studies). However, this would also lead to some serious problems, e.g. that either subjects and experimenters should not be given feedback as regards the success of each trial which tends to make the experiment rather dull for all participants. If feedback is given, subjects and experimenters learn during the course of the experiment which pictures have not as yet been used as targets and hence the targets for the remaining trials have a higher probability of being correctly identified. In most Ganzfeld studies fixed target sets of a limited size are utilized. Zero-order response bias can influence the results in two ways. The randomization can favor certain

targets within the sets which, given the fact that the mentation of the subjects is not random as regards content, can bias the results. Secondly, in the judging procedure the pictures of the set are often presented in a fixed order (for instance when the pictures are coded A,B,C,D and are always presented in this order from left to right). Since it is well known that in a guessing task there is a tendency to favor centrally placed pictures, a randomization using the same codes resulting in a higher frequency of B and C targets (or vice versa) might also effect the outcome. Of course the judging process in free-response studies is intended to avoid guessing, but since subjects are forced to rankorder the pictures to a certain extent guessing will take place.

A further problem posed by the limited number of trials is the restrictions it puts on the possibility of studying correlations with other variables. One score based on one trial as often is the case in Ganzfeld studies can hardly be considered as an adequate measurement of psi performance. When such scores are correlated with measurements of other variables of often disputable reliability and validity one is bound to find either non-significant results or artefacts.

Recording the mentation

Ganzfeld psi studies are based on the assumption that it is possible to detect a relationship between the subject's inner experiences (imagery, feelings, etc.) and the target. Hence it is important to acquire an adequate report about these inner experiences. Therefore the percipient is requested either to give a continuous verbal report of the ongoing mentation or to write down his recollections of his experiences immediately after termination of the session. For obvious reasons the latter method is only applicable when sessions are kept short. The first method is widely used, but apart from the contradiction of having to communicate one's experiences to the external world while being supposed to turn inwardly and to have spontaneous experiences at the same time, it offers some additional problems. In the first place the subject is constantly forced to make a selection of what he experiences and to 'translate' these experiences in verbal terms, a more or less rational and active process. The selection of which experiences to report and the way these experiences are verbalized may strongly differ over subjects. Secondly, to facilitate the judging to be made after the session an

experimenter has to write down these verbal reports. However, rarely will the complete utterrances of the subject have been written down, they will be shortened and if the subject speaks fast, a selection might take place again. Consequently, the recorded mentation will be an inadequate representation of what went on in the subject. The latter can also bias the results, especially when content analyses are to be carried out, when the experimenter who takes these notes is familiar with the target set or, in the case of a small one, with the target pool. Then he might be biassed to pay more attention and rather to note elements which look familiar and fits some picture in the target set and to ignore elements which are clearly unrelated to any of them. Assuming that the experimenter does not know the actual target this will not influence the probability of achieving a hit, but it might lead to a closer correspondence to other pictures suggestive of displacement effects and the like.

The judging

After completion of the Ganzfeld session, in most cases the percipient is presented with a set of pictures including the then still unknown target picture and requested to judge the correspondence between the mentation and each of the pictures. Especially for inexperienced subjects this might seem a difficult task since both the mentation and the pictures will contain a variety of details, elements and meanings, and how to value the various correspondences which will be observed with the different pictures. Unless guidelines are provided each subject will apply some system of his own which sometimes might not agree at all with the intention of the experimenter. Especially Sondow's (26) and Sargent's (29-34) publications are instructive in this matter.

When utilizing for the judging the original target set including the target which has been handled by the agent the possibility arises of an effect of sensory cues. Pictures can be marked (inadvertently or intentionally) by fingerprints, creases, or other signs, slides having been placed in projectors can still be warm, etc.. Using duplicate sets avoids these problems, but even then using the same codes on both sets to identify the pictures offers an opportunity for malpractices.

Occasionally the percipient and/or agent are requested to provide associations from the mentation items or target pictures to aid in the

judging. However, especially when the agent and the percipient are intimately acquainted, the agent's associations may contain various references to the target providing unwanted information. The same holds true but possibly to a lesser degree when an experimenter acts as agent.

The agent

In many studies an experimenter or assistant functioned as the agent. Since such persons are often involved in preparing the materials for the experiment and are naturally interested in the outcome of each trial one can fairly assume especially in the case of a small target pool that towards the end of the experiment the agent will be quite familiar with all pictures. Then it requires a perhaps unrealistic amount of self discipline on part of the agent to blank out the existence of the alternative pictures of the set or pool when viewing the target. This may spoil the design of the experiment which supposes that the agent is only involved in the target picture and might lead to some undesirable psi effects.

The Ganzfeld

The Ganzfeld is intended to induce a certain amount of perceptual isolation by creating a uniform visual field and by presenting random noise. However the effect of such manipulations can be seriously impaired when proper attention is not paid to the other senses. Since the subject is robbed of its most important sensory contacts with the environment which in the case of unexperienced subjects might even be a somewhat frightening experience, other sensory stimuli will become more prominent. In such a situation a stuffy room, feeling cold, a draft, an uncomfortable chair or bed, the heat of a lamp in front of one's face, etc., can be very distractive, even more so because Ganzfeld sessions tend to last quite long.

THE GANZFELD STUDIES INVOLVED

The data on how the experimental variables were operationalized in

the published Ganzfeld studies is presented in the form of a table. Each line in the table represents one publication. Lines are preceded by a number which indicate the reference of the publication. The numbers given to the publications reflect roughly the order in which they were published. The publications preceded by the associated number are listed below.

1. Honorton, C. & Harper, S. 'Psi-mediated imagery and ideation in an experimental procedure for regulating perceptual input', J.A.S.P.R., 1974, 68, 156-168.

2. Parker, A. 'Some findings relevant to the change in state hypothesis', R.I.P. 1974, 1975, 40-42.

3. Palmer, J. and Auer, I. 'An ESP test with psychometric objects and the Ganzfeld: Negative findings', R.I.P. 1974, 1975, 50-53.

4. Stanford, R.G. and Neylon, A. 'Experiential factors related to free-response clairvoyance performance in a sensory uniformity setting (Ganzfeld)', R.I.P. 1974, 1975, 89-93.

5. Braud, W.G., Wood, R. and Braud, L.W. 'Free-response GESP during an experimental hypnagogic state induced by visual and acoustic Ganzfeld techniques: A replication and extension', J.A.S.P.R., 1975, 69, 105-113.

6. Palmer, J. and Lieberman, R. 'The influence of psychological set on ESP and out-of-body experiences', J.A.S.P.R., 1975, 69, 193-213.

7. Rogo, D.S. 'An exploration of some parameters in the Ganzfeld', R.I.P. 1975, 1976, 174-179; Experiment 1.

8. Rogo, D.S. 'An exploration of some parameters in the Ganzfeld', R.I.P. 1975, 1976, 174-179; Experiment 2.

9. Terry, J.C. 'Comparison of stimulus duration in sensory and psi conditions', R.I.P. 1975, 1976, 179-181.

10. Habel, M.M. 'Psi and varying auditory stimuli in the Ganzfeld: The influence of sex and overcrowding on psi performance', R.I.P. 1975, 1976, 181-184.

11. Honorton, C. 'Length of isolation and degree of arousal as probable factors influencing information retrieval in the Ganzfeld', R.I.P. 1975, 1976, 184-186.

12. Smith, M., Tremmel, L. and Honorton, C. 'A comparison of psi and weak sensory influences on Ganzfeld mentation', R.I.P. 1975, 1976, 191-194.

13. Terry, J.C., Tremmel, L., Kelly, M., Harper, S. and Barker, P. 'Psi information rate in guessing and receiver optimization', R.I.P. 1975, 1976, 194-198.

14. Terry, J.C. and Honorton, C. 'Psi information retrieval in the Ganzfeld: Two confirmatory studies', J.A.S.P.R., 1976, 70, 207-217. Experiment 1.

15. Terry, J.C. and Honorton, C. 'Psi information retrieval and the Ganzfeld: Two confirmatory studies', J.A.S.P.R., 1976, 70, 207-217. Experiment 2.

16. Rogo, D.S., Smith, M. and Terry, J. 'The use of short-duration Ganzfeld stimulation to facilitate psi-mediated imagery', E.J.P., 1976, 1, 2, 72-78.

17. Wood, R., Kirk, J. and Braud, W. 'Free response GESP performance following Ganzfeld stimulation versus induced relaxation, with verbalized versus nonverbalized mentation: A failure to replicate', E.J.P., 1977, 1, 4, 80-93.

18. Rogo, D.S. 'A preliminary study of precognition in the Ganzfeld', E.J.P., 1977, 2, 1, 60-68.

19. Dunne, B.J., Warnock, E. and Bisaha, J.P. 'Ganzfeld techniques with independent rating for measuring GESP and precognition', R.I.P. 1976, 1977, 41-43.

20. York, M. 'The Defense Mechanism Test (DMT) as an indicator of psychic performance as measured by a free-response clairvoyance test using a Ganzfeld technique', R.I.P. 1976, 1977, 48-49.

21. Parker, A., Millar, B. and Beloff, J. 'A three-experimenter Ganzfeld: An attempt to use the Ganzfeld technique to study the experimenter effect', R.I.P. 1976, 1977, 52-54.

22. Raburn, L. and Manning, R. 'Sender relaxation and expectation in telepathy', R.I.P. 1976, 1977, 156-158.

23. Palmer, J., Bogart, D.N., Jones, S.M. and Tart, C.T. 'Scoring patterns in an ESP Ganzfeld experiment', J.A.S.P.R., 1977, 71, 121-146.

24. Braud, W.G. and Wood, R. 'The influence of immediate feedback on free-response GESP performance during Ganzfeld stimulation', J.A.S.P.R., 1977, 71, 409-427.

25. Schmitt, M. and Stanford, R.G. 'Free-response ESP during Ganzfeld stimulation: The possible influence of menstrual cycle phase', J.A.S.P.R., 1978, 72, 177-182.

26. Sondow, N. 'Effects of associations and feedback on psi in the Ganzfeld: Is there more than meets the judge's eye?', J.A.S.P.R., 1979, 73, 123-150.

27. Stanford, R.G. 'The influence of auditory Ganzfeld characteristics upon free-response ESP performance', J.A.S.P.R., 1979, 73, 253-272.

28. Palmer, J., Khamashta, K. and Israelson, K. 'An ESP Ganzfeld experiment with transcendental meditators', J.A.S.P.R., 1979, 73, 333-348.

29. Sargent, C.L. 'Exploring psi in the Ganzfeld', Parapsychological Monographs, P.F., 1980. Experiment 1.

30. Sargent, C.L. 'Exploring psi in the Ganzfeld', Parapsychological Monographs, P.F., 1980. Experiment 2.

31. Sargent, C.L. 'Exploring psi in the Ganzfeld', Parapsychological Monographs, P.F., 1980. Experiment 3.

32. Sargent, C.L. 'Exploring psi in the Ganzfeld', Parapsychological Monographs, P.F., 1980. Experiment 4.

33. Sargent, C.L. 'Exploring psi in the Ganzfeld', Parapsychological Monographs, P.F., 1980. Experiment 5.

34. Sargent, C.L. 'Exploring psi in the Ganzfeld', Parapsychological Monographs, P.F., 1980. Experiment 6.

Notes
J.A.S.P.R.: Journal of the American Society for Psychical Research
R.I.P.: Research in Parapsychology
E.J.P.: European Journal of Parapsychology
P.F.: Parapsychology Foundation

THE VARIABLES SCORED

Each column in the table represents one variable. On top of each column the number of the variable and an abbreviation to identify the variable is printed. The numbers, variables, abbreviations and description of the variables are described below. The operationalizations of the variables together with the abbreviations applied for them in the table are also described. Occasionally it showed to be somewhat difficult to extract from the publications details of the experimental procedure or how certain variables were operationalized. Sometimes such data have been deducted from combining different pieces of information. Two examples follow:
In (7) it is stated: 'A coexperimenter - acted as agent and second experimenter, while I acted as recorder, monitoring the subject's mentation', and further on: 'He (the subject) was told that at some period an agent in the adjoining room -'. From both it is concluded (but of course not with certainty) that the first experimenter stayed in the subject's room during the session.
In (10) it is described that 'the experimenter prepared him (the subject) for the Ganzfeld', and further: 'Meanwhile, the agent was put into a sound-attenuated room'. From these sentences it is concluded that at least 2 experimenters have been active in the sessions.

The following abbreviations are valid for all variables:

Y: Yes
N: No
U: Unknown
V: Variable
VAR: The variable is one of the independent variables studied in the experiment and hence is operationalized in different ways.
NR: Not relevant

1 (LABS): The laboratory were the study was carried out is indicated as follows: M: Maimonides; MSF: Mind Science Foundation; C: Cambridge; O: Other.

2 (NUMB EXPR): The number of experimenters and assistants actively involved in each experimental session.

3 (NUMB GANZ STUD): Total number of Ganzfeld studies in which the principal author of the publication (the author first listed) has been

involved and listed as one of the authors.

4 (EXP BEEN SUBJ): Has the experimenter been a subject in his own study? If not explicitly stated that such was the case no (N) is assumed.

5 (FULL PUBL): Is a full report of the study available? In the case of a publication in 'Research in Parapsychology' or in the case only an abstract is available no (N) is given.

6 (TYPE ESP): Type of ESP. GESP: GESP; C: Clairvoyance; P: Precognition.

7 (NON- GANZ COND): Was a non-Ganzfeld control group included in the study. In a few studies a control group has been included to measure the effect of the Ganzfeld procedure on psi. Hence in such a study at least one non-Ganzfeld condition has been compared with at least one Ganzfeld condition.

8 (INDE VARS MANI): Were independent variables manipulated. In some studies an independent variable has been introduced (not involving a control group in a non-Ganzfeld condition) to study its effect on the psi performance. In such cases for all subjects the Ganzfeld technique was applied.

9 (OTHE VARS MEAS): Were other independent variables of a non-manipulative kind measured. Such variables are for instance personality variables, state of mood, questionnaire data.

10 (NUMB PERC): Total number of percipients.

11 (GEND PERC): Distribution of percipients over gender. First number given indicates number of male percipients, second number given indicates number of female percipients. For instance: 15,12 implies 15 male percipients and 12 female percipients.

12 (AGE PERC): Distribution of percipients over age. Numbers indicate range of age. If no numbers were given but it was stated that subjects were students an 'S' is listed.

13 (PERC EXPE): Were percipients not experienced (NE) in the sense that they had no experience with being in the Ganzfeld (if not stated 'not experienced' is assumed) or had they experience (E) with Ganzfeld

studies. In the case it is stated that some percipients were not experienced and some were experienced 'NE,E' is given.

14 (RELA TION PERC EXPR): Relationship between percipient and experimenter. An acquaintanceship prior to taking part in the experiment, for instance percipients attended classes of the experimenter, in the case of friends, relatives, etc., is indicated with an 'A'. In the case the experiment itself has been the occasion for percipient and experimenter to meet each other no acquaintanceship (NA) is listed. When not stated 'NA' is assumed. 'NA' or 'A' is given when that operationalization applies to the majority of the percipients. When the percipients are about evenly distributed over both categories 'NA,A' is given.

15 (RELA TION PERC AGEN): Relationship between percipient and agent. In the case the experimenter or an assistant acted as agent in the majority of the sessions 'not acquainted' (NA) is indicated, unless it was stated that the parties involved knew each other prior to the start of the experiment. When it is stated that in the majority of the sessions the subjects brought in friends or relatives to act as agents an 'A' is listed.

16 (FEED BACK TO PERC): Did the percipient receive feedback after the session as regards the target for that session.

17 (TYPE OF ROOM): Specifics of the room of the percipient: sound-attenuated or sound-isolated (S); electrically shielded (E); normal (NO).

18 (SEAT PERC): How was the percipient seated: lying on a bed or mattrass (L); sitting in a reclining chair (RC); sitting on a chair (C).

19 (DIST LAMP): Distance of source of light to the percipient's eye in inches.

20 (STRE NGTH LAMP): Strength of light source in Watts.

21 (COLO LAMP): Color of light source: white (W); red (R); yellow (Y); blue (B).

22 (PHON USED): Were headphones cq earphones used.

23 (TYPE RAND NOIS): Was random noise fed into the percipient's ear: no (N); white noise (WN); pink noise (PN); other noise (O).

24 (LENG GANZ SESS): Length of the Ganzfeld period per session in minutes.

25 (TYPE TARG): Type of target: slide (S); picture (P); View Master Reel (VM).

26 (SIZE TARG POOL): Size of total target pool in numbers. In the case the binary target pool developed by Honorton was utilized 'BTP' is listed. In the case a part of this pool is used (size of complete pool is 1024) 'BTPxxx' is listed, in which xxx is a number indicating the size of the available pool.

27 (FIXD TARG SETS USED): Were fixed sets of target sets used. A fixed target set (F) implies that the same pictures are always part of a target set. When fixed target sets are used in general the target selection procedure for a session involves first the selection of a target set (if more than one target set is available) followed by the selection of a target picture from the chosen set. An alternative procedure is that first from the total target pool a target is selected, and then also from the total target pool the other pictures which together form the target set. In this case the target sets are not fixed (NF), because the composition of the target set will differ each trial dependent on the selection procedure. In case no judging procedure is carried out, for instance when the analysis of the results is only based on coding of the mentation and coding of the target (utilizing the BTP), 'NR' is listed.

28 (SIZE TARG SET): Size of the target set. The given number indicates the number of pictures in each target set including the target.

29 (TARG BALA NCED): Were the targets balanced over the available pictures in the target sets or pool. In other words, has every picture in each target set been used an equal number of times as target. If not explicitly stated that the targets were balanced over the target pool pictures no (N) is assumed.

30 (PROC SELE TARG SET): What procedure was applied to select (randomly) the target set for a trial: with the help of a random number generator (RNG); with the help of a random number table (RNT); by shuffling decks of cards (S); by tossing coins (TC); by drawing

from a pool of chips (DR); by an 'unknown' random procedure (UR) which means that it is merely stated that the target sets were selected randomly but the random procedure is not described; by a procedure of non-random character (O).

31 (TARG FROM SET/ POOL): Is the target selected from the target set (TS) or is the target first selected from the target pool (TP) followed at some later stage of the trial by the selection of the other pictures for the target set.

32 (PROC SELE TARG PICT): What procedure was applied to select (randomly) the target. For abbreviations see 30.

33 (NUMB TRIA LPER PERC): Number of trials per percipient.

34 (NUMB COND): Number of conditions.

35 (NUMB TRIA LPER COND): Number of trials per condition.

36 (SAME PERC IN COND): Same percipients in the different conditions.

37 (EXPR IN ROOM PERC): Did an experimenter or assistant stay in the room with the percipient during the Ganzfeld session.

38 (EXPR MADE TRAN MENT): Did an experimenter make a transcript of the percipient's mentation during the session.

39 (EXPR KNEW TARG SET): Did the experimenter who made the transcript know which target set was used or was the number of possible targets (for instance because of applying a small target pool) restricted in any other way and their contents certainly or possibly known to the experimenter who made the transcript. Clearly unless stated in the publication (which is in no instance the case) one has to deduce from the available data whether such knowledge was possible. In the cases where I consider that such has been likely a 'possible' (P) is scored. However, the reader should decide for himself based on the original publication whether he agrees with that (necessarily) subjective judgment. When the binary target pool has been applied no (N) is listed.

40 (AGEN KNEW TARG SET): Did the agent know which pictures besides the target picture the target set (or target pool if of limited size) contained. Similar to 39 a 'P' is scored when this might have been

possible.

41 (LENG SEND PERI): Beginning and ending times of sending period given in minutes after onset of the Ganzfeld session. For instance, 20-25 indicates that the sending period started 20 minutes after the onset of the Ganzfeld session and that it lasted for 5 minutes. From 24 (length of Ganzfeld session) it can be seen how long the Ganzfeld session lasted after the sending period ended. If the sending period was n minutes long but in the different trials randomly distributed over the session 'Rn' is listed. In the case the sending periods lasted n minutes but one of 3 periods during the session was randomly selected as the sending period '3Rn' is listed. A sending period of n minutes prior to the Ganzfeld session is indicated with 'Pn'. If the targets were presented tachistoscopically 'T' is given.

42 (ONSE SEND PERI SIGN): Was the onset of the sending period signalled to the percipient. NK means 'not signalled', but the percipient knew which period sending would take place (for instance that sending would take place during the whole session).

43 (DIST PERC TARG): Distance between percipient and target. A number indicates a distance in meters. A number and letter means number of rooms away (nR); number of floors away (nF); number of buildings away (nB). For instance: '0R' would indicate 0 rooms away or, in other words, percipient and target were in the same room. '1B' indicates that the target was located in an adjacent building. In the case of an agent being employed read agent for target.

44 (TYPE JUDG PERC): What type of judging did the percipient have to carry out: select the target (or aiming at direct hits) 'DH'; rank ordering the pictures (for instance from most similar to their mentation to least similar to their mentation) 'RO'; indicating the amount of correspondence between each picture and the mentation (or items of mentation) on a numerical scale (after which sometimes a rank ordering follows based on scale values) 'SC'; coding the mentation in the 10 binary categories of the BTP 'C'; no judging task for the percipient 'NJ'.

45 (SAME DIFF TARG SET): Was the same or a different target set used by the agent and by the percipient to carry out the judging. Same is 'S', different is 'D'.

46 (EXPR OR ACQU AGEN): Who acted in the majority of the sessions as

the agent, an experimenter or staffmember (E) or a friend or acquaintance of the percipient (A). If in this category an E is listed and in category 2 (number of experimenters actively involved in each session) a '1', then the only experimenter acted as agent. If 'E;A' is listed then in about half of the trials an experimenter acted as the agent, in the other trials an acquaintance.

47 (WHO DID JUDG): Who did the judging, the percipient 'P' and/or external judges 'nJ' (n indicating the number of external judges employed).

48 (TYPE PSI MEAS): What type of psi measurement was applied: binary rating procedure 'BRP'; evaluation based on direct hits (first choice picture or picture ranked as having the best correspondence with the target picture) 'DH'; evaluation based on hits (a hit is counted if the target picture belongs to the half of the target set rated as having the best correspondence to the mentation: p(hit)=0.5) 'H'; evaluation based on scale values 'S'; evaluation based on rank ordering 'RO'.

49 (ANY COND SIGN): Did the scoring in one of the conditions reach significance at the .05 level (one-tailed) and for what type of analysis. 'NS' means that the scoring in none of the conditions reached significance. If a type of psi measurement (see 48) is listed it implies that at least in one of the conditions the scoring reached significance with the stated type of evaluation. If the experiment consisted of only one condition 'NR' is listed.

50 (EXPT SIGN): Did the total result of the experiment reach significance.

EXP	1 LABS	2 NUMB EXPR	3 NUMB GANZ STUD	4 EXP BEEN SUBJ	5 FULL PUBL	6 TYPE ESP	7 NON- GANZ COND	8 INDE VARS MANI	9 OTHE VARS MEAS	10 NUMB PERC	11 GEND PERC	12 AGE PERC	13 PERC EXPE
1	M	2	5	N	Y	GESP	N	N	N	30	18,12	18-53	NE
2	O	1	2	N	N	GESP	N	N	Y	30	12,18	18-28	NE
3	O	2	4	N	N	GESP	N	Y	Y	40	29,11	S	NE
4	O	2	3	N	N	C	N	N	Y	40	U	S	NE
5	MSF	1	3	N	Y	GESP	Y	N	Y	20	U	S	NE
6	O	2	4	N	Y	GESP	N	Y	Y	40	15,25	S	NE
7	O	2	4	N	N	GESP	N	N	N	28	U	U	NE
8	O	1	4	N	N	GESP	N	N	N	1	0,1	U	E
9	M	2	5	N	N	GESP	N	Y	N	17	U	S	NE
10	O	2	1	N	N	GESP	N	Y	Y	30	U	U	NE
11	M	U	5	N	N	GESP	N	N	N	U	U	U	E
12	M	2	2	N	N	GESP	N	Y	Y	20	10,10	16-59	E,NE
13	M	2	6	N	N	GESP	Y	N	N	30	11,19	17-50	E,NE
14	M	2	6	N	Y	GESP	N	N	N	12	U	S	NE
15	M	2	6	N	Y	GESP	N	N	N	6	U	U	NE
16	M	2	4	N	Y	GESP	N	N	N	20	U	U	E,NE
17	MSF	1	3	N	Y	GESP	Y	Y	N	24	11,13	19-65	NE
18	M	1	4	Y	Y	P	N	N	N	4	4,0	U	E
19	O	2	1	N	N	GESP	N	N	Y	1	0,1	32	U
20	O	2	1	N	N	C	N	N	Y	49	U	U	NE
21	O	1	2	N	N	GESP	N	Y	Y	24	U	U	NE
22	O	3	1	N	N	GESP	N	Y	N	40	U	S	NE
23	O	3	4	N	Y	GESP	N	N	Y	30	U	S	NE
24	MSF	2	3	N	Y	GESP	N	Y	Y	30	16,14	17-49	NE
25	O	2	1	N	Y	C	N	N	Y	20	0,20	S	NE
26	O	2	1	N	Y	GESP	N	Y	Y	20	6,14	18-42	NE
27	O	1	3	N	Y	C	N	Y	Y	80	42,38	14-55	NE
28	O	3	4	N	Y	GESP	N	N	Y	20	10,10	22-57	NE
29	C	2	6	N	Y	GESP	N	N	Y	26	19,7	19-32	NE
30	C	2	6	N	Y	GESP	N	N	Y	20	13,7	U	NE
31	C	2	6	N	Y	GESP	N	N	Y	20	15,5	U	E
32	C	2	6	Y	Y	GESP	N	N	Y	4	4,0	U	E
33	C	2	6	Y	Y	GESP	N	N	Y	30	25,5	U	E
34	C	2	6	Y	Y	GESP	N	Y	Y	3	3,0	U	E

EXP	14 RELATION PERC EXPR	15 RELATION PERC AGEN	16 FEED BACK TO PERC	17 TYPE OF ROOM	18 SEAT PERC	19 DIST LAMP	20 STRENGTH LAMP	21 COLO LAMP	22 PHON USED	23 TYPE RAND NOIS	24 LENG GANZ SESS	25 TYPE TARG	26 SIZE TARG POOL
1	A,NA	A,NA	Y	S	C	6	U	R	Y	O	35	VM	31
2	NA	NA	U	N	U	U	U	R	Y	WN	30	P	4
3	NA	NA	Y	N	RC	U	U	W	Y	WN	20	P	50
4	NA	NR	Y	N	RC	U	U	W	Y	PN	25	P	50
5	A	A	Y	S	RC	12	U	W	Y	PN	35	P	120
6	NA	NR	Y	N	RC	18	100	W	Y	O	10	P	50
7	NA	NA	U	S	U	U	U	U	N	N	35	VM	U
8	A	A	Y	N	U	U	U	U	N	N	7-12	VM	U
9	NA	A	U	U	U	U	U	U	Y	WN	U	S	BTP
10	NA	A	U	S	C	10	U	R	Y	VAR	40	P	20
11	A	U	Y	N	U	U	U	U	U	U	U	VM	U
12	NA	A	U	S	U	U	U	R	Y	WN	40	P	BTP256
13	A	A	Y	S	U	U	U	U	U	U	30	P	BTP900
14	A	A	Y	S;E	RC	U	U	U	Y	O	30	VM	31
15	NA	A	Y	S;E	RC	U	U	U	Y	O	30	VM	31
16	A,NA	A,NA	U	S	U	U	U	R	Y	WN	7-17	VM	31
17	NA	NA	Y	N	RC	12	30	B	Y	PN	35	S	BTP
18	A	A	Y	S	RC	U	U	R	Y	WN	20-25	P	BTP
19	U	U	U	N	C	U	U	U	N	N	15	VM	30
20	NA	NR	U	N	L	U	U	U	Y	O	U	P	100
21	NA	A	U	U	U	U	U	U	U	U	35	S	U
22	NA	NA	Y	U	U	U	U	U	Y	WN	U	VM	24
23	NA	NA	Y	N	RC	U	75	W	Y	WN	35	S	BTP510
24	NA	A	VAR	N	L	12	30	B	Y	PN	35	S	BTP
25	NA	NR	Y	N	RC	18	U	R	Y	WN	U	P	20
26	NA	A,NA	VAR	S,E	RC	U	U	R	Y	WN	35	P	40
27	A,NA	NR	Y	N	RC	10	40	W	Y	VAR	15	S	36
28	NA	NA	Y	N	RC	U	75	W	Y	WN	35	P	40
29	A	A	Y	S	L	18	60	R	Y	WN	35	P	32
30	A	A	Y	S	L	18	60	R	Y	WN	35	P	80
31	A	A	Y	S	L	18	60	R	Y	WN	35	P	80
32	A	A	Y	S	L	18	60	R	Y	WN	VAR	P	96
33	A	A	Y	S	L	18	60	R	Y	WN	35	P	96
34	A	A	Y	S	L	18	60	R	Y	WN	VAR	P	96

EXP	27 FIXD TARG SETS USED	28 SIZE TARG SET	29 TARG BALA NCED	30 PROC SELE TARG SET	31 TARG FROM SET/ POOL	32 PROC SELE TARG PICT	33 NUMB TRIA LPER PERC	34 NUMB COND	35 NUMB TRIA LPER COND	36 SAME PERC IN COND	37 EXPR IN ROOM PERC	38 EXPR MADE TRAN MENT	39 EXPR KNEW TARG SET
1	F	4	N	S	TS	O	1	1	30	NR	N	Y	P
2	F	4	N	NR	TS	UR	1	1	30	NR	U	N	NR
3	F	5	N	RNT	TS	RNT	1	2	20	N	Y	Y	N
4	F	5	N	RNT	TS	RNT	1	1	40	NR	Y	Y	N
5	F	6	N	S,RNT	TS	S,RNT	1	2	10	N	N	Y	Y
6	F	5	N	RNT	TS	RNT	1	2	20	N	Y	N	NR
7	F	4	N	UR	TS	UR	1	1	28	NR	Y	Y	U
8	F	4	N	UR	TS	UR	1	1	10	NR	U	U	U
9	NR	NR	N	NR	TP	S	2	2	17	Y	U	U	U
10	F	4	N	UR	TS	UR	3	3	30	Y	U	N	NR
11	F	4	N	UR	TS	UR	U	1	7	NR	U	U	U
12	NF	NR	N	NR	TP	RNG,S	2	2	20	Y	N	Y	NR
13	NF	NR	N	NR	TP	S	2	2	15	N	N	Y	NR
14	F	4	N	S	TS	O	V	1	27	NR	N	Y	N
15	F	4	N	S	TS	O	10	1	60	NR	N	Y	N
16	F	4	N	S	TS	O	1	1	20	NR	N	Y	N
17	NF	4	N	S,RNT	TP	S,RNT	4	4	24	Y	N	N	NR
18	NF	NR	N	NR	TP	RNG	5	1	20	NR	N	Y	NR
19	NF	NR	N	NR	TP	UR	6	1	6	NR	Y	N	NR
20	F	5	N	RNG	TS	RNG	1	1	49	NR	Y	Y	N
21	F	6	N	UR	TS	UR	3	3	24	Y	U	U	U
22	NF	4	N	DR	TP	DR	1	4	10	N	N	Y	N
23	NF	4	N	RNG	TP	RNT	1	1	30	NR	Y	Y	N
24	NF	4	N	UR	TP	UR	6	2	90	N	Y	Y	N
25	F	4	N	RNT	TS	RNT	1	1	20	NR	Y	Y	P
26	F	4	N	O	TS	TC	5	2	50	N	N	Y	P
27	F	4	N	RNT	TS	RNT	1	4	20	N	N	N	NR
28	F	4	N	RNT	TS	RNT	1	1	20	NR	Y	Y	N
29	F	4	N	U	TS	RNT	1	1	26	NR	N	Y	P
30	F	4	N	U	TS	RNT	1	1	20	NR	N	Y	P
31	F	4	N	UR	TS	RNT	1	1	20	NR	N	Y	P
32	F	4	N	RNT	TS	RNT	8	1	32	NR	N	Y	P
33	F	4	N	UR	TS	RNT	1	1	30	NR	N	Y	P
34	F	4	N	RNT	TS	RNT	12	1	36	NR	N	Y	P

EXP	40 AGEN KNEW TARG SET	41 LENG SEND PERI	42 ONSE SEND PERI SIGN	43 DIST PERC TARG	44 TYPE JUDG PERC	45 SAME DIFF TARG SET	46 EXPR OR ACQU AGEN	47 WHO DID JUDG	48 TYPE PSI MEAS	49 ANY COND SIGN	50 EXPT SIGN
1	P	R5	N	1R	RO	S	E	S	DH	NR	S
2	Y	20-30	N	U	RO	S	E	S	H	NR	NS
3	P	P3	NR	UR	SC	S	E	S	SC	NS	NS
4	NR	NR	NR	0R	SC	S	NR	S	SC	NR	NS
5	P	30-35	Y	UR	RO	S	E	S	H	S	S
6	NR	0-10	NK	1R	SC	S	NR	S	S	NS	NS
7	P	R5	N	1R	RO	S	E	S	DH,H	NR	NS
8	P	0-5	NK	U	RO	S	E	S	DH,H	NR	NS
9	N	T,U10	U	U	C	NR	A	NR	BRP	NS	NS
10	N	10-40	Y	400	RO	U	A	S	H	NS	NS
11	U	U	U	U	RO	U	U	S	DH	NR	S
12	N	T,P10	NR	UR	C	NR	A	NR	BRP	S	S
13	N	U10	U	UR	C	NR	A	NR	BRP	S	NS
14	P	R10	N	UR	RO	S	A	S	H	NR	S
15	P	R10	N	UR	RO	S	A	S	DH	NR	S
16	P	0-5	NK	UR	RO,SC	S	E	S	DH,H,SC	NR	NS
17	N	30-35	Y	3R	C,RO	S	E	S	BRP,DH,H	NS	NS
18	NR	NR	NR	NR	C	NR	NR	NR	BRP	NR	NS
19	P	10-15	U	UR	NJ	NR	E	6J	RO	NR	S
20	NR	NR	NR	3R	SC	NR	NR	S	DH	NR	S
21	U	30-35	U	UR	RO	U	A	S	U	NS	NS
22	P	U3-7	N	2R	DH	S	E	S	DH	U	U
23	N	3R5	N	5R	C,SC	S	E	S,2J	BRP,SC	NR	NS
24	N	30-35	Y	3R	C,RO	S	A	S	BRP,RO	S,NS	S,NS
25	NR	NR	NR	0R	RO	S	NR	S	DH	NR	S
26	N,P	R5	N	6R	RO	S	A,E	S,2J	DH	S	S
27	NR	NR	NR	UR	NJ	D	NR	3J	SC	NS	NS
28	P	15-20	N	5R	SC	S	E	S,2J	SC	NR	NS
29	P	13-28	N	1B	RO	D	E	S	DH,H,SR	NR	NS
30	P	13-28	N	1B	RO	D	E	S	DH,H,SR	NR	S
31	P	13-28	N	1B	RO,SC	D	E	S	DH,H,SR,SC	NR	S
32	P	0-20	NK	1B	RO,SC	D	E	S	DH,SR,SC	NR	S
33	P	13-28	N	1B,3R	SC	D	E	S	DH,SR	NR	S
34	P	0-20	NK	1B	RO,SC	D	E	S	DH,SR	NR	NS

NOTES

Reference 13, variable 50: Ganzfeld condition significant.
Reference 14, variable 32: In the case the same target set was used again for the percipient the percipient knew that the previous target could not be target for that trial.
Reference 18, variable 41: The target was selected immediately after completion of the Ganzfeld session.
Reference 19, variable 6: The target was viewed in the last 5 minutes of the 15 minutes session. The authors consider the mentation of the first 10 minutes of the session as possibly of precognitive nature.
Reference 22, variable 50: A significant difference between conditions was observed, but no data are given as regards scoring in the conditions or as regards overall scoring.
Reference 23, variables 14,15: Training session (relaxation) prior to start experiment.
Reference 24, variable 14: Introduction tour through the lab prior to start experiment.
Reference 26, variable 40: 'N' for acquaintances being agent, 'P' in those sessions where the experimenter acted as agent.
Reference 28, variable 10: All subjects had 1 to 8 years meditation experience.
Reference 31, variable 13: Only subjects who had scored at least a binary hit in one of the previous experiments.
Reference 32, variable 10: The four experimenters.
Reference 33, variable 43: Each for half of the sessions.
variable 44: Each mentation item against all pictures.
Reference 34, variable 10: The three experimenters.

LIST OF VARIABLES STUDIED

Variables which were systematically manipulated in the study are indicated by (mv).

1: no variables

2: change of state reports

3: use of psychometric object

questionnaire data

4: estimate of ganzfeld duration

5: ganzfeld versus relaxation (mv)
questionnaire data

6: instructions - psychological set
Draw-a-Person test
Bett's imagery scale
questionnaire data

7 no variables

8 no variables

9 subliminal versus supraliminal target presentation (mv)

10: different auditory stimuli (mv)
sex differences agent-percipient

11: no variables

12: subliminal versus supraliminal target presentation (mv)
Bett's imagery scale

13: forced-choice technique versus Ganzfeld (mv)

14: no variables

15: no variables

16: no variables

17: Ganzfeld versus relaxation (mv)
verbalized versus nonverbalized mentation (mv)

18: no variables

19: comparison mentation before and during sending period (mv)

20: Defense Mechanism Test

21: experimenter effect (mv)
questionnaire data

22: knowledge as regards nature of experiment (mv)
agent versus no-agent sessions (mv)
physiological readings

23: agent viewing target stroboscopically (mv)
period of sending during Ganzfeld (mv)
questionnaire data

24: feedback (mv)
questionnaire data
Bett's imagery scale
target complexity

25: menstrual cycle phase

26: subjects associations from mentation (mv)
feedback (mv)
questionnaire data
agent percipient relationship
sex differences agent percipient
number of sessions per day

27: type of auditory ganzfeld (mv)
interruption of auditory ganzfeld (mv)
questionnaire data

28: TM graduates as subjects
questionnaire data

29: personality tests: extraversion and anxiety
agent percipient relationship
questionnaire data

30: personality tests: extraversion and anxiety
agent percipient relationship
questionnaire data

31: personality tests: extraversion and anxiety
agent percipient relationship
questionnaire data

32: length of Ganzfeld session (mv)
personality tests: extraversion
questionnaire data

33: test/retest reliability (mv)
personality tests: extraversion
first versus second half transcripts mentation
questionnaire data
Bett's imagery scale

34: agent percipient relationship (mv)
length of Ganzfeld session
questionnaire data

MISCALLENEOUS OBSERVATIONS BY AUTHORS

The following notes selected by me are observations and impressions by authors not based on the analyses of data but of a subjective nature. As stated in the introduction in order to study the conclusions reached by the authors based on the experimental data one should consult the original publications. These observations are identified with two numbers, the first representing the reference, the second the page on which the observation is stated.

(1,164) Memory, in particular, seems to serve as a vehicle for psi-mediation.

(1,165) Although some subjects 'seemed to know' when the agent was beginning the sending period --- , there tended to be very little target-related content during the sending periods.

(4,92) In the present clairvoyance study both of us were struck by the dramatic character and abundance of seeming displacement (that is, focussing on a control picture rather than the target), which led to psi-missing.

(11,185) The length of isolation thus appears to be a critical factor in psi Ganzfeld work.

(14,214) It has become an informal policy in our laboratory for experimenters to serve as subjects in pilot sessions prior to formalization of experimental studies.

(14,214) We attempt to promote a sense of relaxed confidence in our subjects. We indicate that we have obtained success in prior work with these procedures and that we regard it as likely that they may also experience success in a psi interaction.

(14,214) We believe it is important to recognize that certain aspects of these procedures are potentially threatening.

(18,64) During the precognitive Ganzfeld, there was some qualitative evidence that subjects were by-passing the target in order to latch onto images generated by previous subjects.

(16,75) --subjects who had been successful subjects during earlier Ganzfeld research at the Maimonides Division continued to score direct hits coupled with strong qualitative responses.

(23,130) We noticed during the experiment that subjects occasionally would report imagery closely resembling one of the pictures in the target set other than the actual target.

(26,124) The crux of any free-response judging system is, in the end, the problem of how completely and accurately the judge can link the correct target to the often distorted and transformed elements of the target material when it appears in the mentation.

(26,142) It has often been noticed that psi sometimes manifests in the form of reactivated memories --- and, ---, qualitative material in the present experiment supports this observation.

(28,340) In the present case, it is obvious that the subjects and independent judges used somewhat different rating criteria and that the criteria used by the subjects were relatively maladaptive.

(28,340) Although it would seem on the surface that familiarity with one's internal states and processes would make one a better judge, this is not necessarily the case if, for example, one applies invalid logic to the interpretation of such experiences and/or their relation to the external world.

(29,29) The first thing we learned was that Ganzfeld research was fun.

(31,41) By now, we had concluded that factor analysis (of questionnaire data) was pretty much useless from the point of view of providing any predictive variables or any deeper understanding of our data.

(33,76) -- we utilized no 'warning blips' or preparation period in this experiment. Subjects were instructed to start reporting whenever they felt like it. The lack of interruption may have contributed to the success.

(34,86) Motivation and, particularly, expectancy seem to be indicated as possibly the important variables to watch out for.

(34,94) -- in my experience Ganzfeld experimentation requires verbally fluent subjects.

(34,94) I do not feel that working with people who don't know the experimenters is likely to be productive.

REFERENCES

Burdick, D.S. and Kelly, E.F. 'Statistical methods in parapsychological research'. In Wolman B.B. (ed) 'Handbook of parapsychology', New York, Van Nostrand Reinhold, 1977.

Honorton, C. 'Methodological issues in free-response psi experiments'. J.A.S.P.R., 1979, 73, 380-394.

Kennedy, J.E. 'Methodological problems in free-response ESP experiments', J.A.S.P.R., 1979, 73, 1-15. (a)

Kennedy, J.E. 'More on methodological issues in free-response psi experiments', J.A.S.P.R., 1979, 73, 395-401. (b)

ERRATUM

We regret that in Research Letter No. 9 of Frebuary 1979 two pages were misprinted. The order of the pages 24 and 25, part of the paper 'Characteristics of subliminal perception found first in ESP' by C.B. Nash should be reversed.