# THE TRAINING OF EXTRASENSORY PERCEPTION IN THE GANZFELD

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This thesis is lovingly dedicated to my mother,

Joan S. Flatland

**Abstract**

The elusive nature of ESP constitutes one of the greatest problems in parapsychology; namely, ESP results are not readily replicable. One answer to the replicability problem lies in training subjects to improve their ESP scoring. This thesis presents three experiments aimed at training subjects to improve their ESP scoring by teaching them to recognise target-related information contained in free-response data, which due to transformations, may be otherwise unrecognisable.

The ganzfeld technique is used in these experiments. The ganzfeld is reputed to be one of the most successful methods for eliciting significant ESP results. The experimental ganzfeld literature is reviewed with specific reference to its success in obtaining significant results.

A review is made of the different methods which were devised to train subjects to improve their ESP ability. The training studies which have been conducted are examined. The approach to improving ESP scoring taken by the author is described and defended.

The first study conducted for this thesis was designed to familarise the author with all aspects of the ganzfeld, from the perspective of the experimenter, subject, and agent. It utilised a multi-session design in which three subjects participated in ten ganzfeld sessions each. No significant ESP scoring was elicited in this study.

The second experiment involved the testing of six subjects, selected to be extraverted-sheep. Each subject participated in twelve sessions, each of which was followed by a detailed discussion with the experimenter. The overall results were non-significant, but two subjects did display significant ESP scoring, one psi-hitting ($p = .034$, 2t.), and one psi-missing ($p = .008$, 2t.). No significant scoring incline, indicating across-session scoring improvement, was obtained.

In the third study twenty subjects participated in two ganzfeld sessions, after having received training designed to help them recognise and overcome various problems experienced by the subjects in Experiment II. The overall results of this study were non-significant, and various attempts at identifying response characteristics related to psi-hitting were unsuccessful.

# D E C L A R A T I O N

I declare that this thesis is my own work

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**CHAPTER ONE**

**INTRODUCTION**

## §1.1 Introduction

The last four decades have witnessed a change in the direction of parapsychological research. Prior to this period the majority of experimentation being done was aimed towards establishing the existence of paranormal or extrasensory abilities (ie, abilities which function outside of the known sensory channels). More recent research has tended to be increasingly process-oriented in nature; where 'process-oriented' is used to refer to work which is aimed towards gaining an understanding of the functioning of extrasensory abilities.

A major concern of such research has been the development of a method to train subjects to improve their extrasensory performance. Achievement of this goal is often considered to be of paramount importance to parapsychology. 'Nothing could do more at the present time to advance the cause of parapsychology as a science than some method of developing a dependable level of ESP ability in an ordinary volunteer subject' (Beloff and Mandleberg, 1966, p. 229).

The interest in developing training methods for increasing extrasensory ability arises from the need to obtain more reliable psi-scoring in experimental situations (Beloff, 1967; Murphy, 1969;

Tart, 1980). Psi[1] is often referred to as having an elusive nature: it does not show itself on demand, and most experimenters expend considerable effort in trying to create environments favourable to its occurrence; more often than not without success. This lack of repeatability of experimental psi results gives rise to two of the most important problem areas encountered by parapsychologists: the problems that the elusiveness of psi creates in terms of theory-building and theory-testing; and the difficulty of convincing others of the existence of psi (Johnson, 1981).

Efforts directed towards theory-building and theory-testing are obviously confounded by the repeatability problem: before ESP can be examined in these ways, it must first be elicited. Furthermore, if it is not elicited, one can do little more than speculate about the possible reasons for its absence. Given this state of affairs, it is not surprising that great advancements in the field have not been made, in over a hundred years of examination. Or, as stated by Beloff (1967, p. 120), ´progress is possible in science only when the relevant phenomena are available for research´.

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1. The word ´psi´ has been defined as being used ´either as a noun or an adjective to identify paranormal processes and paranormal causation´ (Thalbourne, 1982, p. 56). For the purposes of this thesis, psi will be used to refer specifically to extrasensory perception (ESP). ESP is a term coined by J.B. Rhine, referring to ´the acquistion of information about an external event, object or influence (mental or physical; past, present or future) otherwise than through any of the known sensory channels´ (Thalbourne, 1982, p. 27).

The second primary problem arising from the elusive nature of psi is that of convincing others of the existence of the phenomena. Parapsychology is often referred to as a ´pseudoscience´ (e.g., Flew, 1985) and it still lacks general credibility. The awarding of the Koestler Chair of Parapsychology to the University of Edinburgh provides an excellent example of the credibility problem facing parapsychology. Even in the restrictive financial climate facing British universities today, only **two** were willing to have the Chair, **and** the reported half million pounds which would support it.

This lack of credibility has serious financial repercussions for the field. It would not be an exaggeration to say that when one chooses a career in parapsychology, they are generally choosing a career which will provide little reward in terms of material well-being or status. Increased credibility for the field should result in increased financial resources, which would not only benefit those already in the field, but also would help to attract new talent to it. If psi experimentation could achieve a greater level of repeatability it is possible that many more people could be convinced its existence, and, thus, of its credibility.

Clearly, the need to establish a reliable means of producing statistically measurable psi is of utmost importance. If a method could be developed which improved a subject´s ability to score significantly above chance on any given psi test, then many of the above difficulties could be overcome. This author quite agrees with Tart when he stated:

> I am by no means the only one who has long recognized that a (if not the) major problem in parapsychology is that psi phenomena are generally too weak and unreliable to be either demonstrated on demand or, more importantly, studied efficiently; thus one of the major problems in our field is to discover a way to make psi phenomena stronger and more reliable (1980, p. 211).

## §1.2 Thesis Contents

This thesis presents three experiments, which were aimed at improving subjects´ ESP scoring ability. All three studies utilised the ganzfeld technique. The ganzfeld technique presents subjects with an unpatterned, homogeneous visual and auditory field which induces a state in the subjects similar to the hypnogogic state. This state gives rise to an abundance of mental imagery, some of which may be extrasensory in origin. The ganzfeld has, as will be argued in the next chapter, a most impressive record in producing above-chance scoring. It was hoped that by using this technique, in conjunction with various experimental manipulations, the subjects would display an improvement in their ESP scoring.

Chapter 2 presents an examination of the ganzfeld technique (hereafter referred to as the ´ganzfeld´). The chapter will also present a brief history of the development of the technique, and its experimental use will be illustrated by a detailed description of a ´prototype´ ESP ganzfeld study.

A debate concerning the true replicability rate of the ganzfeld began in 1981 (Honorton, 1983; Hyman, 1983), and still continues. This debate, and the reviews of the ganzfeld literature leading up to it, will be discussed, and conclusions regarding the ganzfeld's success rate will be drawn. A discussion of the psi-conducive qualities of the ganzfeld will also be presented.

The experimental use of the ganzfeld technique has varied from study to study. The various factors involved in the use of the technique, which have been subject to different manipulations in different studies, will be examined to determine whether certain applications of these factors appear to be related to study outcome. The form, and manipulations in use of the technique as employed in the three studies comprising this thesis, will then be defended in light of this examination.

Chapter 3 presents reviews of various approaches to the training of ESP, and of the existing ESP training studies. The training approach adopted in the studies for this dissertation differs from those of other training studies, and will be explained and justified in that chapter. The final section of the chapter considers various ethical considerations which arise from conducting ESP training experimentation.

Chapters 4 through 6 present the three studies. The first study (Experiment I, reported in Chapter 4) was a pilot study, designed to familiarise the author with all aspects of the experimental use of the ganzfeld, from the perspective of the subject, the agent, and the experimenter. The second study (Experiment II, presented in Chapter 5) involved an attempt to train a small sample of selected subjects to recognise certain types of commonly occurring ESP ´errors´, using a multi-session experimental design. Chapter 6 presents the third study (Experiment III), in which twenty subjects participated in a training session developed from findings of the second experiment, and then were tested in two ganzfeld sessions. Experiment III was an exploratory study, conducted in an attempt to try to identify certain response factors which appeared to be characteristic of ESP-related responses. If such characteristics were identified, they could be of great assistance in teaching subjects to recognise target-related responses.

The final chapter of the thesis contains a discussion of the overall findings from the three experiments.

## §1.3 Issues and Personal Beliefs

The training of ESP involves many philosophical and theoretical issues, which are outwith the scope of this essentially experimental thesis. Numerous publications have addressed these issues, and the interested reader is referred to the discussions of these factors, and to references for further reading, which are offered in Wolman´s (1977) Handbook of Parapsychology, and in Krippner´s (1977, 1978, 1982, and 1984) Advances in Parapsychological Research 1 - 4. However, a general statement of the present author´s beliefs in regard to the most central of these issues, may be helpful in clarifying certain perspectives which gave rise to the experiments conducted for this work.

The most central concept behind this thesis is the assumption that ESP does exist, and can be produced experimentally. That this is so is far too vast a concept to be discussed in any detail. Instead it will simply be stated that this author believes that there is ample evidence in existing experimentation to support such a view. The general review of ESP experimentation presented by Palmer (1978) was instrumental in the forming of this belief in the existence of ESP, and the author refers the reader to that excellent source.

The reader's attention is also drawn to what the author regards as a most persuasive case for the existence of ESP, based upon experimental findings. The argument, made by Palmer (1977), is based on findings correlating ESP with other variables. He states that given the weak and unreliable nature of ESP results, any correlations between these findings and other variables should be expected to be quite small, and variable. If the null hypothesis (ie, that there are no relationships between ESP and other variables) was supported, one would to expect to find that:

> 1. An approximately equal number of experiments should show positive and negative relationships between ESP and variable X, regardless of significance level.
> 2. An approximately equal number of the statistically significant relationships between ESP and variable X should be in each direction.
>
> Substantial departures from either of these patterns would suggest that there is a genuine and generalizable relationship between ESP and variable X, even though only a small proportion of the sample relationships were statistically significant, a likely possibility considering the unreliability of ESP scores. (Palmer, 1977, p. 176.)

Palmer has found correlations existing between certain personality traits and ESP which appear to argue in favour of rejecting the null hypothesis, as stated above. However, he does not put the above hypothesis forward as being evidential of the existence of ESP, concluding that more research is needed and that ´(alas!) more reliable ESP scores will be needed´ (Palmer, 1977, p. 197).

Most of the critical arguments against the existence of ESP are based on: accusations of fraud (Hansel, 1966); flawed experimental designs and/or flawed statistical evaluation (Hyman, 1985); an a priori basis (eg, ´ESP is incompatible with current scientific theory´; Price, 1955, p. 360); and the lack of repeatability of results (Crumbaugh, 1976).

The first two categories listed (fraud and flawed experimental designs and/or evaluation) are arguments which could be levied against any area of scientific research. The controversial nature of parapsychological research, and the resistance which some people appear to have towards the possible existence of such phenomena, result in many more criticisms of this type being directed towards parapsychology than other areas of research.

The a priori argument could be (and has been) leveled at many areas of enquiry in the past, which have now been incorporated into the mainstream of scientific knowledge. If people throughout history had not been willing to question, and to expand upon existing knowledge, progress of any kind would be impossible.

The problem of repeatability is one which is as problematic for parapsychologists as it is for their critics. However, as will be discussed in detail in Chapter 2, some areas of parapsychological research have a level of repeatability which far exceeds what could possibly be explained by purely chance occurrence.

A full consideration of the arguments for and against paranormal research would entail a much more detailed discussion than the very cursory one offered here. The interested reader is referred to Ransom's 'Recent Criticisms of Parapsychology: A Review' (1976) and Crumbaugh's 'A Scientific Critique of Parapsychology' (1976) for more comprehensive considerations of these issues.

Another key issue relevant to this thesis is the question of whether or not psi ability, as reflected in ESP scoring, can be trained. At present there is little evidence available from which to formulate an answer this question, which is dependent upon the unknown manner in which ESP functions. Again, it would be well outside the scope of this thesis to examine the various theories of psi functioning. These theories are presented in the articles by Chari and Stanford in Wolman's <u>Handbook of Parapsychology</u> (1977) and in the papers by Chari, Rao, Roll, and Randall in White's <u>Surveys in Parapsychology</u> (1976a).

However, regardless of the mode of ESP functioning, there is no reason to suppose that ESP cannot be developed in the same manner as can any other sense or ability of man (Beloff, 1967). Or, to quote Murphy (1969, p. 10): 'it seems to me that the cultivation of the paranormal gift is not unlike the cultivation of almost any other kind of gift, ...whether learning to play Bach fugues on the piano or learning to wiggle one's ears'. Given the importance that discovery of a means to reliably improve ESP scoring would have for the field of parapsychology, the pursuit of such a discovery appears a worthwhile undertaking.

## §1.4 Research Objectives of This Dissertation

The type of ESP training which the experiments presented in this thesis are aimed towards is not specifically derived from or based upon any model or theory of psi functioning. The primary objective of the studies was to train subjects to learn to overcome various 'errors', which often occur when ostensibly psi-originated information is brought to their conscious awareness. This approach to ESP training is not an attempt to increase the subjects' receptivity to psi influences. Instead it focuses upon improving subjects' ability to recognise and interpret any psi impressions which they may receive. It is a functional approach, aimed specifically at attempting to train subjects to improve their ESP scoring in experimental settings.

The errors referred to may be thought of as involving mis-interpretation, and/or transformation, of the orginal ESP impression. To quote Warcollier:

> The telepathic image is not transmitted in the same way as a wireless photo. The image is scrambled, broken up into component elements which are often transmuted into a new pattern. It seldom arrives complete and organized. (1948/1963, p. 30.)

These errors are thought to occur during the process when unconscious psi information enters conscious awareness.

The definitive work examining such errors is Warcollier's (1948/1963) book, Mind to Mind. The book provides an exhaustive descriptive analysis of the various transformations which may occur to psi influences as they pass through the unconscious to the conscious mind. Warcollier hypothesises that these transformations occur as a result of the subject's personality and memory interacting with the ESP impression: without this interaction the impression would be unrecognisable and meaningless to the subject. Thus he states:

> It is the impact...of the unconscious forces from within the personality of the percipient upon the target...that activates memories and associated feelings within him...He must draw upon his organized patterns of feeling and thinking to give meaning to what arrives from the unconscious. (1948/1963, pp.94-95.)

Murphy (1963), in describing the processes underlying Warcollier's work, defines telepathy as a primitive process which is less developed and differentiated than rational thought. As the 'primitive' telepathic impulse develops and enters the subject's consciousness, it takes the form of images. According to Murphy, 'these images may be distorted as are dream images whose symbolism calls for interpretation ... As a result of all these distorting processes, the end result may lose the orginal meaning...' (1963, pp. 16-17).

The literature of experimental parapsychology is full of examples of such transformation errors. Drawing studies, in which a subject tries to reproduce a sensorially-removed target drawing, provide a particularly rich source of such errors (Sinclair, 1930/1962; Warcollier, 1948/1963). Thalbourne (1981) provides an excellent historical review of drawing experiments, and highlights some of the types of errors which may occur.

Of course, the study of psi responses is always problematic as one can never postively differentiate between psi-originated imagery, and, non-psi imagery which, by coincidence, appears to relate to the target. This difficulty is further complicated when one is attempting to examine possible psi responses which have been transformed to some degree. The human mind is quite inventive, and could conceivably find some connection, however remote and unlikely, between any given image and a set of possible targets. How can this problem of distinguishing between psi and non-psi responses be overcome?

The approach adopted in this thesis, and by experimental parapsychologists in general, is to define paranormal occurances in terms of statistical probablity. The studies in this thesis have all been designed so that a chance level of occurance can be established. The actual results obtained may thus be compared to chance expectancy, using established statistical procedures. If the experiment is well designed and methodologically sound, and, if the results differ significantly from chance expectancy, it may be concluded that the obtained results are unlikely to be due to chance alone (the degree of unlikelihood being dependant upon the obtained level of significance).

However, the statistical approach does not allow for any specific response to be positively labelled as psi-originated. Therefore, in attempting to train subjects´ to recognize potentially psi-originated information which had been transformed, the author did not attempt to distinguish between psi and non-psi imagery. The approach taken in these studies was directed towards making the subject aware of and sensitive to **possible** response/target correspondences which may occur. Thus, these studies do not represent an attempt to teach subjects to identify psi-originated responses per se, but rather to **sensitize** subjects to different ways in which potential psi information may appear in their responses.

The question now arises as to the feasibility of training subjects to recognise and overcome transformation errors. Warcollier suggested that by being ´unusually analytic, we may, at times, be able to penetrate the disguise´ (1948/1963, p. 97) of the conscious ESP impression. Based on Warcollier´s evidence, Murphy (1963) also believed that a person could be trained to learn to sift through his imagery and identify the genuine telepathic impluse. Sinclair (1938/1962) felt that to learn to recognise ESP imagery, subjects would have to be trained in introspection, and gave instructions as to how one might do this (Sinclair´s ideas of developing introspective ability will be considered in Chapter 3).

This author also believes that it should be possible to train subjects to learn to better identify and distinguish psi-originated from non-psi imagery. It is felt that this could be accomplished by training subjects to use various analytical strategies when they evaluate experimentally-produced imagery. This approach to ESP training does not involve an attempt to train subjects to increase the quantity of psi influences which they may experience. Rather, it focuses upon improving a subject's ability to recognise and interpret potentially psi-originated impressions, **after** they have been received. It is possible that ESP may often be occurring in experiments, but, due to 'transformations', it is not recognised. The experiments contained in this thesis represent an attempt to help subjects to learn to recognise potentially target-related information, possibly gained by them through ESP, which, due to transformations, may otherwise have been unrecognisable.

## CHAPTER TWO

## THE GANZFELD TECHNIQUE

### §2.1 Introduction

The purpose of this chapter is to review the published body of experiments utilising the same method as has been used in the research conducted for this thesis, namely the ganzfeld technique. The ganzfeld technique, used by parapsychologists for the past eleven years, has been incorporated into the experimental designs of 72 published studies. A list of these studies, compiled by the author, is presented in Appendix 1. These 72 studies include all published studies which use some form of ganzfeld stimulation, however modified.[1] Given the complexity of design and variation of purpose found in these studies, it would be impossible to review adequately each of these experiments in the space of one chapter. Instead, this review will concentrate on those factors which are relevant to the use of the technique in this thesis.

The ganzfeld technique was chosen for use in this research because of its relative success in eliciting significant, extra-chance psi-scoring from unselected subjects. However, there is no set formula which comprises the ganzfeld. The basic technique

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1. This includes works which have been published as full papers in a parapsychological journal, and those which have been published as an abstract of a brief in Research in Parapsychology (a book published yearly, containing abbreviated versions of papers which were accepted for presentation at the annual convention of the Parapsychological Association).

allows for many different interpretations of its use. One result of this is that the ganzfeld has appeared in a large variety of forms in various experiments. Thus one factor of primary importanc was to determine what form the ganzfeld should take to be most effective in producing psi results. To this end, the various experimental manipulations of the ganzfeld will be examined in relation to successful outcomes. Other factors which could influence the success of the ganzfeld will also be considered.

Of equal importance to this research were questions regarding the true efficacy of the ganzfeld in producing significant psi results. The technique has often been evaluated as having a replication rate of approximately 50 per cent (Honorton, 1977; Honorton, 1978; Sargent, 1979; Blackmore, 1980). If these evaluations are accurate, the ganzfeld must be seen as the most effective psi-producing method to date. However, criticisms of the ganzfeld studies (Hyman, 1983a, 1985) have forced a re-evaluation of the claimed replication rate. This chapter will review, and seek to draw conclusions from, this continuing debate. Questions pertaining to why the ganzfeld is successful in the eliciting of psi will then be considered.

Before proceeding with the review a brief history of the development of the ganzfeld will be presented. The first such experiment conducted by parapsychologists (Honorton and Harper, 1974) will then be presented in detail. That study is the prototype of all ganzfeld work conducted since, and should give the reader a clear idea of the basic design of a ganzfeld experiment.

## §2.2 Brief History of the Development of the Ganzfeld Technique

The word 'ganzfeld' is derived from German, its literal meaning being 'whole field' (ganz - 'whole'; and feld - 'field'). The word's original use in psychology was in connection with Gestalt theory. It was used to describe an homogeneous, unpatterned visual field (ie, 'whole field'). According to Gestalt theories of arousal, perceptual processes require stimulation of an inhomogeneous nature to function normally.

The earliest work in this area was carried out by Metzger (cited in Hochberg et al., 1958) in 1930. To obtain an homogeneous visual field, Metzger sat his subjects close to a white-washed wall which had white-washed wings attached at its four edges. When low illumination was used, subjects' perception changed in such a manner that the wall was perceived as being a space-filling fog.

Little further experimentation with the visual ganzfeld followed until Hochberg, Triebel, and Seaman (1958) conducted a series of studies in 1951, examining colour adaptation under conditions of ganzfeld. Hochberg et al. were testing Kaffka's prediction that a totally homogeneous coloured field of light (ganzfeld) would appear eventually to lose its colour and fade to neutral. In their work translucent hemispheres were used to create a ganzfeld condition. The hemispheres were made from table tennis balls (ping pong balls), which had been cut in half so as to conform with the contours of the eye sockets. The hemispheres were then attached to the subject's eyes by means of a surgical adhesive, which covered all cracks to ensure that the subject was perceiving a completely homogeneous field. The main advantage of this form of ganzfeld over that of Metzger was that it allowed the subject an homogeneous total field of vision, whereas Metzger's method allowed the nose and other objects to be seen by peripheral vision.

In the first experiment of Hochberg et al.'s series, the subject was exposed to both red and green light while wearing the hemispheres. In the red field condition subjects reported that the red changed into a total disappearance of colour within three minutes. Under green light the change of colour was to a black or dark grey shade, within six minutes. Some subjects also reported seeing hallucinatory shapes.

In 1954, Bexton, Heron, and Scott (1958) conducted an experiment using a visual ganzfeld similar to that of Hochberg et al. In Bexton et al.'s study the subjects lay on a bed in a sound-proof cubicle, while wearing translucent goggles, for 24 hours. The study also incorporated an auditory element, in that the subject wore a foam rubber U-shaped pillow on his head, in which earphones were placed to allow minimal communication with the experimenter. The use of the pillow, along with the monotonous hum of an air-conditioner and fan, provided the subject with 'a fairly efficient masking noise' (Bexton et al., 1958, p. 323). This masking noise can be interpreted as providing a facsimile of auditory ganzfeld (ie, an auditory stimulus of an homogeneous, un-patterned nature).

The overall effects of this stimulation were characterised by a deterioration in the subject's ability to think systematically and productively, and a general impairment of mental ability. The subjects seemed to experience a 'stimulus hunger', which was displayed by efforts to self-create stimuli by means of singing or talking to oneself, or physically interacting with the environment. The ganzfeld stimulation also produced a marked increase in visual imagery. This visual imagery (hallucinations) was experienced by the subjects as being quite unusual, 'like having a dream when awake' (Bexton et al., 1958, p. 325). The hallucinations varied from rather simple geometric patterns, to quite complex and realistic scenes. Auditory hallucinations and other sensory distortions were also reported.

The next major development in the history of the ganzfeld occurred in 1964 when Bertini, Lewis, and Witkin (1972) developed a procedure to facilitate the eliciting of hallucinatory imagery (hypnagogic imagery). The procedure utilised a visual and auditory ganzfeld. The visual component was produced by attaching halved table tennis balls over the eyes and shining a light source in front of the face. The auditory component consisted of white noise (a totally homogeneous, unpatterned sound) being relayed through headphones. The subject was instructed to say aloud all thoughts, images, and feelings which he or she experienced while receiving this stimulation. This procedure was judged by Bertini et al. to 'facilitate the flow of ideation and imagery and is evocative of feelings' (1972, p. 111). It also was found that some subjects developed a preoccupation with the experimenter, which suggested a growing transference whereby the subject 'used' the experimenter as a source of feelings.

The procedure described above formed the basis of ganzfeld use in parapsychology. The first parapsychologists to publish use of the ganzfeld technique were Charles Honorton and Sharon Harper, in 1974. In the introduction to their experiment Honorton and Harper described their reasons for using the ganzfeld in psi research as follows:

> From the observations of Bertini et al., it would appear that the "experimental-hypnagogic" procedure could provide a fruitful method of stimulating laboratory psi interactions. Specifically, the procedure incorporates three features which may facilitate the psi process: (a) reduction of sensory "noise" through the regulation of perceptual input; (b) increased imagery and ideation which may serve as "mediating vehicles" for encoding psi information (Tyrrell, 1946); and (c) establishment of an effective link between the subject and the experimenter or agent, increasing subject's desire for communication. (1974, p. 106)

Honorton and Harper's first study will now be presented in some detail, in order to inform the reader of the design of a standard ganzfeld experiment.

§2.3 The Prototype Ganzfeld Experiment: Honorton and Harper, 1974

Thirty subjects (18 males and 12 females) took part in the experiment. The subjects were 'unselected', in that they were not chosen for any particular trait or ability which they might possess.

They represented a wide variety of ages (18 to 53), and occupations.

The ´agent´ is the person whose role is to paranormally ´send´ information regarding the target to a subject. The subjects were allowed to be accompanied by a friend, to act as agent, if they so wished. If not, a staff member from the laboratory would act as the agent. In the latter case, the subject and the staff member were given a brief period to meet and become slightly acquainted.

The subject was then taken to a sound-attenuated room, in which he[1] or she would receive the ganzfeld stimulation. The subject was seated in a comfortable chair, and halved table tennis balls placed over his eyes. The gaps at the edges were filled with cotton. A red light was then shone on the face from a distance of approximately six inches. The repetitious sound of waves breaking on a shore was relayed to the subject through headphones (white noise was not used, as some subjects had found it annoying during pilot sessions). The volume of sound was adjusted according to subject preference.

Before putting on the headphones, the subject would receive brief instructions from the experimenter (this experimenter is referred to as the ´subject experimenter´). The subject would be told to try to verbalise everything which passed through his mind during the session, including all imagery, thoughts, sensations, and emotions. He was instructed also to keep his eyes open as

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1. To avoid the cumbersome and awkward repetition of he or she, him or her, etc., all subjects will be referred to using the male gender throughout this thesis.

much as possible. Finally, he would be asked to relax completely, and to let the imagery come passively.

The agent would be escorted to a room from which he would ´send´ (ie, view) the target. The agent´s location was of great enough distance from the subject´s room so as to prevent any form of known sensory communication between the two. A second experimenter would then choose the target set for the session. In this experiment there was a total of 31 target sets, each containing four targets. The target material consisted of View Master slide reels. Each reel contained seven thematically-related frames, which the agent would view through a slide projector. The four reels in each target set were selected to be as different from each other as possible. The method used to select a target set consisted of shuffling and cutting a deck of 31 cards, each card of which contained the number of one of the target subjects. The specific target for each set was chosen by means of using whichever reel was uppermost in the target set.

The agent was to ´send´ the target for five minutes. The 35 minutes the ganzfeld stimulation lasted thus were broken down into seven possible sending periods, although only five of these periods were used in the experiment. The specific period to be used in each session was decided by means of the same shuffling and card-cutting process as described above.

The agent received brief instructions from the second experimenter as to how to send the target. He was told first to view the whole reel quickly; then to go back and concentrate on each frame intensively, and try to 'send' the picture to the subject. At the end of the five minute sending period he was to return the target reel to its target pack, shuffling it together with the other slides.

As stated above, the subject remained 'in the ganzfeld' (received ganzfeld stimulation) for 35 minutes. The subject was not aware of when the agent would be sending the target. The subject experimenter heard the subject's mentations ('mentations' refer to all the verbilisations made by the subject) via an intercom system, and wrote them down. The subject experimenter would not communicate with the subject unless there was a long break in the mentation report. This experimenter also would signal the agent when to start and end the sending period.

The subject had been informed that the noise on the tape stopping signalled the end of the stimulation period. The subject experimenter removed the subject from the ganzfeld and would then review with the subject the mentations which the latter had made. The subject then viewed the four reels in the target pack, and rated them according to the degree of correspondence between the reels and his mentations. A correct response, referred to as a 'direct hit', was counted when the reel to which the subject gave the highest ranking for mentation correspondence had been the target reel for that session.

The results for the 30 sessions showed that there were 13 hits, giving a scoring success rate of 43.3 per cent. The mean chance expectancy (MCE) rate was 25.0 per cent. This result is statistically significant (CR-corrected for continuity, Z = 2.11, p = .017 one-tailed).

Honorton and Harper presented some examples of the correspondences which occurred between the mentations and the target reel during the experiment. These excerpts revealed a high degree of correspondence, as can be seen in the following example:

> Target: 'U.S. Air Force Academy'
>
> Mentation report: Pre-sending:
> '...an airplane floating over the clouds... planes passing overhead ... thunder, now, angry clouds ... airplanes ... ultrasound ... a blaze of fire, red flames. A five-point star ... an airplane pointing down ...'
>
> Sending: 'An army boot ...'
>
> Post-sending: 'A giant bird flying ... six stripes on an army uniform, V-shaped. A face from the stripes. Now a V ... a mountain range snow-capped. Flying through the mountains ... the sensation of going forward very fast ... machine gun. A ladder'. (1974, p. 164)

The significant outcome of this study, the quality of the information it provided, and the relative ease of conducting a ganzfeld experiment prompted many others to conduct similar studies: this is shown by the number of experiments to be considered in this review. However, there are some problems with this first study, which unfortunately can be found in other ganzfeld experiments as well. In particular, it contains several methodological flaws. Briefly, these are as follows: 1) the target selection procedure was not truly random; 2) duplicate target sets were not used (the agent could have left some clue, consciously or unconsciously, on the target which had been observed by the subject and may have influenced his judging); 3) inadequate information was given concerning factors which influenced the security of the experiment (eg, no mention was made as to how the target set passed from the agent to the subject, to be judged). Such errors shall be considered in detail later in this chapter. They are mentioned here only to alert the reader that, while Honorton and Harper's study is the prototype ganzfeld experiment, it does not represent the ideal. The large body of work which developed from Honorton and Harpers' initial ganzfeld study shall now be considered in more detail.

## §2.4 Replicability Rate of Ganzfeld Experimentation

### Early Estimates of the Replicability Rate

The Honorton and Harper 1974 experiment was the first published ganzfeld study. However, two other experiments (Braud, Wood, and Braud, 1975; Parker, 1975a) using the Ganzfeld technique were being conducted during the same period, without the authors knowing of the other work being done with the technique. Of these experiments, that by Braud et al. achieved significant above-chance psi scoring, while the Parker study did not. Terry and Honorton (1976) conducted two replication experiments of the Honorton and Harper study. Both of these had significant above-chance scoring.

These results encouraged other researchers to carry out ganzfeld experimentation. In 1977 Honorton published the first review of the ganzfeld literature, which at that time consisted of sixteen published studies. Of these, eight had significant over-all psi scoring at the 0.05 level. Ganzfeld studies thus claimed a success rate of 50 per cent, whereas only five per cent could be expected by chance. One factor that Honorton (1977) identified which may have related to the success or failure of ganzfeld experimentation was that successful experiments had used a length of ganzfeld stimulation which was approximately fifteen minutes longer than that of the unsuccessful studies.

Honorton made another review of the ganzfeld literature in 1978. His data base had now grown to include 26 experiments, fourteen of which were classified as having overall significant outcomes at the 0.05 level. Honorton stated that this represented a success rate for ganzfeld experiments of 54 per cent. He calculated that the replication rate of these studies, when compared to chance expectation at the 0.05 level, was highly significant ($p = 8 \times 10^{-12}$). Further, he believed that his finding was 'a conservative estimate, since nine of these fourteen studies achieved significance at the 0.01 level or lower' (Honorton, 1978, p. 86).

In his 1978 review Honorton considered the possibility that the replication rate could be somewhat inflated, due to non-significant studies not being published. However, he dismissed this idea, on the basis that even in the highly unlikely situation that there were ten unreported failures for each reported successful study, the replication rate would still reach significance at $p = 0.02$.

<u>Are Early Replicability Estimates Inflated By Methodological Flaws?</u>

The ganzfeld replication rates, as estimated in Honorton's reviews (1977, 1978), did much to promote even greater interest in the technique, and to motivate further ganzfeld research. His reviews were primarily descriptive in nature, however, and, as such, were not necessarily intended as critical assessments of the literature. With hindsight, it seems regrettable that some of the methodological flaws contained within these studies were not pointed out, in order to avoid their repetition. Furthermore, his estimates of the ganzfeld success rate may have been greatly inflated, due to the presence of various experimental flaws.

Prior to conducting the first experiment (Experiment I) for this thesis, a survey of the literature was conducted to determine if various factors could be related to successful ganzfeld experimentation. More details of this survey are presented later in this chapter (in section 2.7), but as one factor considered is related to methodological flaws, the findings regarding that factor will be reported at this time.

The studies examined in this survey were those contained in Honorton's (1978) review. The same method employed by Honorton (1978) was used to determine whether or not a study had a successful outcome. Thus, successful studies were those which reported significant overall results; unsuccessful studies were those whose results were non-significant. When comparing studies in the manner used in this survey, it was necessary to establish that the success of some studies could not be explained by methdological flaws contained in them.

The possibility of allowing the agent to pass sensory cues to the subject, or the judge, is one of the most obvious flaws which could greatly affect the outcomes of these studies. Unfortunately, not one of the studies reviewed used a duplicate target set, in order to avoid such a possibility. This is not a major problem in a study such as Stanford and Neylon's (1975), which used a clairvoyant design whereby the target was never directly handled prior to the judging. Of the other 22 experiments surveyed here, three did not specify whether or not duplicate targets had been used. The remaining nineteen all neglected this basic precaution. As this flaw was as common in the unsuccessful studies as in the successful ones, it is unlikely to have accounted for the high success rate demonstrated by these latter experiments. Nonetheless, it does constitute poor methodology: flaws such as this can seriously undermine an otherwise promising body of work.

The first published assessment of methodological flaws that can occur in free-response experimentation such as ganzfeld work was written by Kennedy (1979a). This valuable, and, it could be argued, overdue paper highlighted several problems commonly found in free-response studies. The three areas most pertinent to ganzfeld work addressed by Kennedy involved data selection, sensory cues, and multiple analysis.

By data selection Kennedy is referring to circumstances where some part of a study's data has been discarded. The most common occurrence of this involves situations where a subject drops out of an experiment before completing all of his experimental sessions: some subjects who score poorly in early sessions may be more likely not to complete their intended sessions than subjects who initially do well. Kennedy stresses the need to report the outcome of the discarded data, to avoid creating a biased sample.

The problems relating to sensory cues, by the use of a single target pack by both the agent and the judge, have been discussed above. Kennedy recommends that judges should never be able to obtain any cues from target materials regarding identity or the timing or order in which a target was used.

Multiple analysis problems arise when more than one statistical test is used to measure the same data. There are five different measurements commonly used to estimate overall scoring in ganzfeld studies (Sargent, 1980a):

1) Binary hits, where a hit is scored if the target is placed in the top half of the available ranks (MCE = 50%).

2) Direct hits, where a hit is scored if the target is given the highest rank (MCE = 100/N per cent, where N is the number of available ranks).

3) Sum of ranks, where all the ranks allotted to the target are taken into consideration (see Solfin, Kelly and Burdick, 1979. MCE = $x(n + 1) / 2$).

4) Rating of data (Stanford and Mayer, 1974), where all the pictures in a target pack are rated independently on a scale of 0 - 99, from which a Z-score is computed using the formula:

Z = (rating for target) - (mean of ratings)/standard deviation of ratings (these Z-scores are not normally distributed).

5) Honorton's (1975) method, developed for use with his Binary Target Pool (BTP), in which a ten content-category binary measurement may be made for targets taken from the 1024 picture pool (BTP). The subject's mentations also may be measured in this manner, and the two then matched.

It is not uncommon for more than one of these methods to be used when assessing experimental results. This use of multiple analyses results in inflated levels of significance, as the probability of obtaining a significant outcome increases with the number of analyses performed. Furthermore, if only one analysis is reported, the reader may wonder exactly how many analyses were carried out to obtain a significant result.

This does not imply that all use of multiple analyses should be abandoned. Kennedy states that they may be beneficial in some circumstances: 'multiple analyses, however, are not necessarily misleading and, in fact, may be desirable in free-response studies since they can provide confidence in the reliability of the scoring procedure' (1979a, p. 6). In order to overcome some of the problematic aspects of multiple analysis, Kennedy recommends that experimenters be careful to state all the analyses which were attempted and give their reason(s) for using any particular test. Furthermore, the experimenter ought to differentiate clearly between planned, and post-hoc, analyses.

Kennedy believes the greatest problems involving use of multiple analyses arise when an entire line of research is evaluated. The primary problem he notes is the difficulty of deciding which analysis should be used to represent a study, when several analyses were reported. This may be complicated further if one analysis obtained a significant result and another did not. As already noted, the significance of any analysis chosen to represent a study may be inflated, due to the use of other analyses. To help resolve these problems, Kennedy advises that experimenters should select, prior to a study being conducted, a specific analysis of overall effect to represent the study when it is included in an evaluation of a line of research.

The question now arises as to how these factors may have effected Honorton's estimates of the success rate of the ganzfeld experiments. In making his assessments, studies were considered to be successful if they reported significant extra-chance scoring at the 0.05 level. He then computed the exact binomial probability for the number of studies which had significant results, compared to the number which would be expected by chance (5%). The levels of significance which these studies reported were inflated, due to the presence of methdological flaws such as those already noted. In considering Honorton's estimations of ganzfeld replicability, Kennedy believes that 'the figures for the overall significance and reliability ... are certainly somewhat inflated and perhaps extremely so' (1979a, p. 8).

In reply to Kennedy, Honorton (1979) points out that many of the studies were significant at a much lower level than the 0.05

level which he adopted for his analysis. Thus he believes that his estimates, far from being inflated, are, in fact, conservative. As regards data selection, Honorton feels that Kennedy did not mention the most important aspect of this factor: that of selective reporting of significant results. If non-significant outcomes were not being reported, or if studies were being abandoned because the scoring seemed unpromising, the true replicability rate could be much lower than it appeared. In examining the possible influence of selective reporting, Honorton used Rosenthal's (1978) method to assess the number of unreported, non-significant experiments needed to lower the combined probability, for all the reported studies, to non-significance. Applying this method to the ganzfeld studies Honorton estimated that 275 unreported non-significant studies would be needed to lower the estimated replicability rate to that expected by chance ($p < 0.05$, two-tailed). Given the amount of time required to conduct a ganzfeld study, and the number of researchers in parapsychology, he concluded that selective reporting of ganzfeld studies could not possibily account for the success rate of these studies.

In examining the possible influence of sensory cues, Honorton compared the mean overall z score derived from the distribution of hits and misses between those studies where sensory cueing was possible, and those where it was not. He considered that any study using a clairvoyant design, the BTP, or outside judges could not have been open to sensory cueing effects. Using a t-test to compare these overall z scores, he discovered that the studies in which sensory cueing might have occurred obtained a smaller ESP main effect than those in which sensory cueing was not possible. From this, he concluded that sensory cueing could not have been a factor in inflating estimates of ganzfeld success.

It should be noted that in the survey of the ganzfeld studies conducted by the present author, any study was counted as being open to sensory cues if the target used in the judging had been handled by either the subject or the experimenter (as in some clairvoyant designs). Honorton's categorisation is looser than that of this survey, which took into consideration any possiblity of cueing occurring, regardless of how unlikely such an occurrence might be. In ESP experimentation, the strictest possible guidelines should be observed with regard to sensory cueing. Thus Honorton's classification of which studies may have contained sensory cues may be seen to be unnecessarily lax. In the author's survey only one experiment was discovered which was considered to be free from sensory cueing possibilities (Stanford and Neylon, 1975). Thus, the author's categorisation of the data was not analysed using Honorton's method, as the data base for sensory cue-free studies was too small to allow a meaningful comparison.

Kennedy (1979b) feels that Honorton had not adequately addressed the various problems which these methodological problems create, as he had failed to address the problems arising from multiple analysis. In calculating the success-rate of the ganzfeld, and in his estimation of the effect of selective reporting, the manner in which Honorton has estimated the significance level of each study assumes that only one analysis was carried out. Kennedy (1979b, p. 397) concludes:

> If essentially the same analyses [as Honorton performed] were carried out but correcting (somehow) for the number of analyses in each experiment, the figures for the combined results would be less significant than those that have been reported. This is not to say that they would be nonsignificant, but only that in the present form they are exaggerated to an unknown degree.

The first estimates of ganzfeld replicability to take into consideration the possible influence on the replicability rate that the methodological problems, noted by Kennedy, might have had, were made by Sargent (1979), and Blackmore (1980). Both authors took the approach of basing their estimates of the success rate on a data base which excluded studies which they felt to be flawed. Unfortunately, neither Blackmore's nor Sargent's review identified which studies were judged to be flawed, nor gave any information identifying specific flaws with particular experiments.

Sargent (1979) reported that he found eight of the 26 studies Honorton reviewed to contain flaws which rendered the experiments 'methodologically inadequate' (p. 11). Once he had eliminated these studies from the data base, nine of the eighteen remaining were still judged to have significant results. Thus Sargent estimated the ganzfeld replicability level to be 50 per cent.

Blackmore (1980) estimated that the ganzfeld data base then consisted of 31 studies, of which 18, or 58 per cent, obtained significant above-chance scoring. However, of these 31 experiments, she considered only 12 to be methodologically adequate. Of these 12, six, or 50 per cent, had obtained significant results. From this she concluded that 'clearly the adequacy or otherwise of the methods used makes little difference to the apparent replicability of the technique' (p. 214). However, like Honorton, she believed that selective reporting of results could have contributed to the apparent success of the technique.

She decided to test this possiblity in a more direct manner than had Honorton, by sending questionnaires regarding any unpublished ganzfeld work to all members of the Parapsychological Association who had conducted ganzfeld experimentation, or who may have done so. The forty questionnaires which were returned revealed 32 further ganzfeld studies. Of these, twelve were reported as not completed. One of the 20 completed studies could not be analysed. Of the remaining nineteen, fourteen were judged to have adequate methodology. Of these fourteen studies, five, or 36 per cent, had significant results at the 0.05 level. Blackmore feels that this replication rate is comparable to that found by Honorton (1977, 1978) and Sargent (1979). She concludes that 'the bias introduced by selective reporting of ESP ganzfeld studies is not a major contributor to the overall proportion of significant results' (p. 217).

As has been previously noted, while multiple analyses may lead to inflated significance levels, their use does not constitute a methodological error. As also has been noted, Kennedy considered them useful, in that they could provide confidence in the reliability of the scoring procedure. Multiple analyses may also prove most useful in exploratory research (Hyman, 1983b).

Simply to eliminate any ganzfeld study which has employed multiple analyses from examinations of the technique's success rate could lead to sound experiments being discarded. As neither Blackmore (1980) nor Sargent (1979) specified why, or which, experiments were excluded from their analyses, it is impossible to determine if methodologically-sound studies were eliminated from their replicability estimates.

The obvious need is to find some method by which all the studies in a line of research may be evaluated, taking into consideration possible flaws which various of them may contain. Towards this end, Kennedy suggests:

> ...the most appropriate way to carry out analyses and draw conclusions involving entire lines of research would be to make a table ...in which all the experiments would be listed along with the presence or absence of various methodological problems (eg. improper statistics, number of analyses, possibility of sensory clues, etc.). In order to draw firm overall conclusions, all the methodological factors must be considered simultaneously, not each in isolation and ignoring the others (1979b, p. 396).

Schouten (1981) constructed such a table, in which he categorised the 34 studies which by then had been published, according to 50 different details involved in ganzfeld experimentation. In this massive undertaking he included details which related to various flaws, as well as listing many other factors about the precise manner in which the studies were conducted. The table was presented as a reference list to assist other ganzfeld experimenters in designing their studies, and also as a reminder of the various details which one should specify when writing up studies. Schouten conducted no analyses, nor drew any conclusions, on the basis of this information.

In order to draw the ´firm conclusions´, that Kennedy referred to, from such a table, some common ground would have to be found which would allow all the studies to be considered equally. Sargent (1981a) suggested a somewhat different approach to the question of analysing lines of research. He proposed that one should analyse the data ´(a) altogether, and then (b) selected with respect to specific criteria such as the possibility of sensory cueing´ (1981a, p. 431). Sargent is here suggesting that meta-analysis techniques should be employed to properly assess the ganzfeld data base. A clear, concise definition of meta-analysis is given in the Overview of the <u>Psychological Research Laboratories 1982 Annual Report</u>:

> META-ANALYSIS: ´Meta-analysis´ stresses systematic statistical analysis ´across´ studies with the studies´ outcomes as dependent variables and their designs and procedures as the independent variable (<u>eg</u>. Glass, McGaw and Smith, 1981; Rosenthal and Rubin, 1982a and b). This permits us to quantify the relationships between studies´ outcomes and factors in the experimental procedures and to evaluate their strengths (p. 37).

The problems involved in performing a meta-analysis are complex, and statisticans are still debating what methods are appropriate for conducting an analysis of this type (Hyman, 1982). The ganzfeld data base is particularly problematic, due to the variety of methods of statistical analysis used in it to establish studies' significance. For example, trying to find common ground upon which to consider three experiments, where one used a direct hit analysis, another the BTP method, and a third computed a sum of ranks test, is not a simple task. Nonetheless, in order to attain an accurate estimate of the true replicability rate for ganzfeld experiments, a meta-analysis of the studies would appear necessary.

## §2.5 Meta-analysis of Ganzfeld Studies (The Hyman/Honorton Debate)

Meta-analyses of the ganzfeld studies, to determine the true replicability rate of the technique, have been made by Ray Hyman (1983a, 1984, 1985), and Chuck Honorton (1982a, 1982b, 1983, 1985). Much of this work has consisted of unpublished exchanges between Honorton (1982a, 1982b) and Hyman (1982, 1984), which have been widely circulated, by the parties concerned, to interested others. The communications between Honorton and Hyman involve several hundred pages of detailed information regarding their analyses. Furthermore, the number of studies under consideration, the arguments put forth in support of their analyses, and their criticisms of each other's analyses have changed and developed over the years. It is quite outwith the scope of the present review to detail all the various aspects of this exchange, and, thus, of their meta-analyses. Instead, this review will focus on the most recent publication of their respective meta-analyses, presented in the Journal of Parapsychology, Vol. 49, No. 1, 1985, the entire issue of which is devoted to presentations by Honorton and Hyman. Findings from their earlier analyses will also be presented, briefly, where appropriate.

The importance of this debate to the work to be presented in this thesis is two-fold. Firstly, as previously stated, the ganzfeld technique was chosen for use in this thesis due to its high level of replicability. Thus any work addressing ganzfeld replicability is most germane to this work. Secondly, this debate, and especially the Hyman analysis, presents thoroughly many of the methodological flaws which are present in the ganzfeld literature. While some of these flaws have been mentioned in the preceding sections of this chapter, they had never been clearly delineated until Hyman and Honorton did so, during their debate.

When the first two experiments contained in this thesis were conducted the Honorton/Hyman debate had not yet begun. However, the third experiment in this thesis was conducted in 1985, by which time the debate had assumed a role of great importance to ganzfeld researchers, in particular, and to parapsychology in general. This debate, as presented in the 1985 publication, will be discussed in some detail, for reasons relating both to ganzfeld replicability, and to methodology.

Before proceeding to the Honorton/Hyman debate, however, a brief history of its origins may prove useful. Ray Hyman is a respected, and 'highly regarded critic of parapsychology' (Mishlove, 1983, p. 20). In 1981 he accepted an assignment to make a critical assessment of the current state of parapsychology (Hyman, 1983a). He thought it appropriate to base this assessment on the most promising area of current parapsychological research, and so elected to critique the ganzfeld, 'as a result of both reading some of the parapsychological literature and of talking with some parapsychologists' (Hyman, 1983a, p. 3).

Charles Honorton is a leading parapsychologist, and co-author of the first published ganzfeld study. He has been one of the most prolific ganzfeld experimenters, and is still actively involved in ganzfeld research. In 1981 Hyman requested from Honorton a copy of all known ganzfeld studies, to enable him (Hyman) to conduct as thorough an assesment as possible (Hyman, 1983a). In January 1982 Hyman received from Honorton copies of 42 studies, along with Honorton's analysis of various characteristics of them. Disagreements soon arose between Hyman and Honorton regarding each other's analysis of these studies. Inorder to correct what Honorton perceived as errors in Hyman's analysis, Honorton also conducted a meta-analysis of the studies.

The 42 studies which Honorton sent to Hyman had been conducted between 1974 and 1981. Many further studies have been published since Honorton first compiled his list. Furthermore, the list did not contain several studies, conducted between 1974-1981, which were either unknown to Honorton at the time, or which may have contained a ganzfeld component, but were not considered by him to be ´true´ ganzfeld studies. At Hyman´s suggestion, both reviewers decided to limit their examination of the ganzfeld to the 42 studies contained in Honorton´s orginal list.

The initial requirement, for both researchers, was to find a way to make an across-studies assessment of the outcomes of these experiments which would be uninfluenced by the effects of multiple analysis. To this end, Honorton (1983) employed the Bonferroni method. This method adjusts the alpha level in accordance with the number of analyses performed on the data; the alpha level used to determine significance is divided by the number of analyses performed, to obtain a revised alpha.

For example: Terry and Honorton (Experiment I, 1976) performed three different analyses on their data (direct hits, binary hits, and ´t-by-team´). Significant results at an alpha of 0.05 were obtained for two of the analyses. To adjust for the three analyses made, 0.05 is divided by three, giving a revised alpha of 0.0167. Using the revised level of significance, one of the initial three analyses remained significant. Using this method, Honorton (1983) estimated that nineteen of the 42 studies remained significant at the 0.05 level, giving the ganzfeld a success rate of 45 per cent.

Hyman (1983) has criticised Honorton´s use of the Bonferroni correction method. When employing this method Honorton made his adjustments according to the number of analyses actually reported in each study. Hyman finds fault with this approach for two reasons. Firstly, he believes the reported number of analyses does not reflect the 'implicit' number made. In other words, he implies that the number of analyses actually reported may not be the actual number of tests which were conducted.

Hyman's second criticism concerns Honorton's interpretation of the number of analyses which the authors made. Hyman believes that Honorton frequently under-calculated the number of tests conducted. For example: for the study by Braud, Wood and Braud (1975), Honorton counted three analyses; Hyman, nine. For the study by York (1977), Honorton counted one test; Hyman, eight. For Roney-Dougal (1981), Honorton counted five tests; Hyman, 531. The difference between Honorton's and Hyman's calculations of the number of analyses made is due to Honorton's counting the number of over-all psi-scoring analyses made, whereas Hyman counts **all** the tests which are possible to make in such studies.

Regarding Hyman's first criticism of Honorton's alpha adjustments, it would be poor methodology not to report all the analyses which are carried out in a study. One hopes that parapsychologists are not commonly guilty of this. Furthermore, as many of the ganzfeld studies specify using several analyses, Hyman's implication seems somewhat at odds with the published facts. Nonetheless, until researchers make a point of specifying exactly which analyses were planned, and reporting all that were actually performed, criticisms of this kind will remain valid.

Hyman's second criticism seems ill-founded. Honorton's adjustments were made only for analyses which concerned overall psi-scoring, which is the measure he is concerned with establishing. To consider all possible analyses, including those for purposes other than measuring over-all scoring, appears pointless.

Honorton (1985), perhaps in response to Hyman's criticisms of the Bonferroni method of alpha correction, also presented a meta-analysis based only on those studies which reported direct hits. He calculated the exact binomial probability and obtained an associated z score for each of the 28 studies which reported direct hit information (see Appendix 2 for a list of these twenty-eight studies). He found that twelve, or 43 per cent, of the studies obtained z scores significant at the 0.05 level. He also computed a composite z score, using the Stouffer method (Rosenthal, 1978), which gave a highly significant z score of 6.60 ($p < 10^{-9}$). From this Honorton concludes that using one analysis as a uniform index of success, the overall ganzfeld effect is still 'strong and highly significant' (1985, p. 59).

The method used by Hyman to correct for multiple analysis involved computing an effect size for each study. He used the Freeman-Tukey arc sine transformation for binomial proportions (Freeman-Tukey, 1950, cited in Hyman, 1985) on both the number of hits, and the expected number of hits. The difference between the two transformations, in degrees, gave the effect size, for which z scores were then computed. The effect size was calculated from the number of direct hits obtained in a study. When the number of direct hits was not given, his calculations were based on binary hits, or binary coding. Thirty-six of the 42 ganzfeld studies provided the necessary information to allow him to calculate effect size and z scores. These 36 studies provided the data base for his meta-analysis (see Appendix 3 for a list of these studies).

Using the above method, Hyman produced an average effect size of 5.98, which he calculated corresponded to a direct hit rate of 34 per cent, as compared to the 25 per cent expected by chance. He also calculated a composite z score of 6.27, which is comparable to that found by Honorton. However, he argues that these findings do not represent a strong significant ganzfeld effect, due to their correlation with various flaws which he identified in the data base.

Honorton and Hyman have many disagreements about what should constitute a study when an experiment has more than one condition. As some of the studies contained control conditions, only those conditions which were assessed to provide ganzfeld stimulation were considered. Conditions were also eliminated from assessment if they departed dramatically from normal ganzfeld procedure.

One example of this is the Raburn and Manning (1977) study. This experiment contained four conditions, two of which tested subjects who were unaware of the psi nature of the experiment. As this represents a radical departure from normal ganzfeld experimentation, Honorton has eliminated these two conditions from his analysis. This particular study is the only one in which the two remaining conditions were treated as separate studies, due to basic differences in their composition (ESP vs. clairvoyance).

In the author's opinion Honorton may be justified in his treatment of the Raburn and Manning study because: a) no other ganzfeld study has ever tested subjects who were unaware that they were in a psi experiment and, given the unknown manner in which psi operates, this manipulation could possibly nullify the occurrence of psi; and b) the two conditions should be treated as separate studies because they were examining two psi tasks which may be substantially different from eachother.

While Hyman accepts Honorton's classification of study units, he argues that, if the Raburn and Manning study is divided by conditions, then all of the other studies should be likewise divided. If this were done, he estimates there would be over 80 study 'units', of which 25 obtained significant results, giving an overall success rate of 31 per cent.

The author believes Honorton is justified in not sub-dividing the other studies, as the conditions which they contain do not differ greatly, either in the psi task being measured, or in the type of ganzfeld stimulus provided to the subject (unlike the Raburn and Manning study). Hyman, in counting 80 study units, is creating artificial divisions, unintended in the original studies, without offering any constructive reasons for doing so.

Hyman next raises the problem of selective reporting. He isolates three areas which could contribute to this problem: un-reported non-significant studies (the so-called 'file-drawer problem'); studies which were not completed, due to unpromising results; and work reported (most commonly very small studies) which was not intended for publication, but **was** reported subsequently, due to achieving significant results (he calls these ´retrospective´ studies). He estimates that the various factors involved in selective reporting could further lower his estimate of a 31 per cent success rate.

Blackmore´s (1980) questionnaire covered all the aspects of selective reporting which Hyman raises, and found no convincing evidence suggesting the occurrence of such practices. Hyman (1983), however, believes that Blackmore´s review may have under-estimated the true effect of selective reporting, for three reasons. Firstly, by sending her questionnaire only to members of the Parapsychological Association, she may have excluded some researchers. Secondly, as she only received responses from 47 per cent of her sample, many studies may still have remained undetected. Thirdly, she relied on the respondents´ evaluation of their work, in determining significant or non-significant outcomes. He believes that some of these evaluations would have to be revised if measures such as multiple analyses were taken into consideration.

In the author´s opinion, Blackmore´s findings successfully stand up to the criticisms offered by Hyman. Hyman´s first two points regarding Blackmore´s investigation have a measure of validity. However, with regard to the first point: the majority of parapsychological researchers who would be capable of conducting a sound ganzfeld experiment, are members of the Parapsychological

Association. Regarding Hyman's second point, it is personally thought that a person would be more likely to return the questionnaire if he in fact had conducted some ganzfeld work, thereby receiving at least some acknowledgement of his effort, than would a person who had never done such work. Hyman's third point does not apply, as Blackmore **did** exclude from her estimation over a quarter of the studies reported to her, for reasons of poor methodology. For these reasons, in considering the possible effects of selective reporting, Hyman may be seen as attempting to make the proverbial 'mountain out of a molehill'.

Honorton also believes that it is unlikely that selective reporting could result in significantly lower estimates of the ganzfeld replicability rate. His reasons for this are thoroughly presented in his 1985 response to Hyman. The main points of his arguments are: 1) publication of null results is common in parapsychology, as witnessed by many of the ganzfeld studies; 2) using a file-drawer estimate, fifteen un-reported null studies would have to exist for every reported study, to negate the known ganzfeld replication rate: given the time needed to conduct a ganzfeld study, and the number of researchers in the field, the existence of such a large un-reported data base is extremely unlikely; and 3) regardless of the significance of the outcome, free-response studies commonly have small sample sizes. The author considers Honorton's points on this issue to be sound.

Hyman (1985) next puts forth the argument that these studies have an effective error rate (eg. alpha level) closer to 0.25

than to 0.05, as generally assumed. His reasons for this are based on factors related to multiple analysis. As previously mentioned, multiple analyses will increase the effective error rate of any study which does not correct the alpha level to account for the number of analyses made. Hyman identifies six different ways that multiple testing has occurred in the ganzfeld studies:

1.) multiple indices, referring to the use of more than one of the five tests which are commonly used to analyse ganzfeld experiments;

2.) the use of alternative tests. By this Hyman refers to the use of more than one test on the same index. To illustrate the use of an alternative test he cites Raburn and Manning´s (1975) study, where both the Fisher exact test and the chi-square test (which is an approximation of Fisher´s test), were applied to the number of direct hits received;

3.) the use of multiple baselines, where psi is measured against both the theoretical baseline (MCE) and an empirical baseline (often the case where conditions are tested against each other to examine differences between them);

4.) the use of multiple dependent variables; as in Stanford´s (1979) study, where targets were matched against the entire transcript, and then against only the second half;

5.) multiple grouping. This occurs when two conditions are tested separately, as well as pooled; and

6.) when independent judges are used to score the data, along with the subjects. In this case the alpha would have to be adjusted for the multiple analyses created by the contribution of both the subjects, and the independent judges', results. Using the success rate of 31 per cent estimated from his 80 study unit analysis, Hyman posits that the ganzfeld replication rate is approaching that which would be expected by chance (given an error rate of 0.25).

These points certainly apply to the studies as published. Several studies, which Honorton (1977, 1978) had earlier classified as obtaining significant results, were re-classified as non-significant after the alpha level was corrected for multiple analysis. When listing these various errors, Hyman gave frequent referrences to their occurrence in the ganzfeld studies. Nonetheless, both of Honorton's later estimates of the technique's success rate were based on analyses which had corrected for multiple analysis, and, thereby, all the error types listed above. Thus, in Honorton's 1983 and 1985 estimates of the ganzfeld's success rate, the effective error rate has been restored to 0.05, rendering Hyman's error rate arguments non-relevant.

This is not said to demean Hyman's effort in identifying such errors. He has provided the first truly thorough analysis of the errors contained in these studies, and has carefully documented their occurrence. One hopes that his comments will be carefully considered whenever future ganzfeld research is carried out.

Other methodological factors which could lead to an inflated ganzfeld success rate estimate concern procedural flaws.

Controversy over such flaws has been the area of greatest dispute between Honorton and Hyman. Their disagreements centre mainly upon the assignment of various flaws to specific studies; but there is also some dispute over the definitions of what should constitute the various flaws, and over how best to analyse the effect of these flaws upon the ganzfeld replicability rate. The presentation of these factors here will, by necessity, be relatively brief. The interested reader is referred to the very detailed consideration of these flaws by Honorton (1982a, 1982b), and Hyman (1982, 1984), or the briefer summaries of their positions as presented in their 1985 articles.

Given that procedural flaws do exist, how should their effect upon the ganzfeld's replicability be measured? As there is no precise way to judge the possible influence of any of these factors, both Honorton and Hyman have taken the general approach of dividing the data base into successful (ie. those with overall significant outcomes) and unsuccessful (ie. those with overall non-significant outcomes) studies. They then examine the data base to determine if the flaws correlate with study outcome, using the flaws as the independent variable, and study outcome as the dependent variable. If such a relationship were established, it could be claimed that the apparent success rate of the ganzfeld is spurious, due to the procedural flaws which the apparently significant studies contain.

Hyman (1985) found six different procedural errors contained in the ganzfeld data base: 1) inadequate randomisation; 2) use of a single target set; 3) feedback; 4) inadequate documentation; 5) inadequate security; and 6) statistical errors. A summary of his definitions of these flaws, and his estimates of the frequency of their occurrence, is given below.

1.) Inadequate randomisation can refer either to the procedure of choosing a target pack, or to which of its members is to serve as the target, in a session. In his analysis Hyman considered any study to be flawed in this respect if it did not specify using a random number table (RNT) or random number generator (RNG), when selecting which member of a target pack was to be used as the target. Eleven studies, or 26 per cent, were considered adequate in this respect, and 31, or 74 per cent, were judged inadequate (this latter figure includes sixteen studies which did not provide specific information about the method of randomisation used).

2.) The use of a single target has been identified already as allowing the possible occurrence of sensory cueing. Hyman assigned this flaw to 23 studies, or 55 per cent of the data base.

3.) A flaw assignment of ′feedback′ was given when the target picture was not returned randomly to the target pack before being presented to the subject. This flaw could only occur in the 23 studies which used a single target set. Of these, 43 per cent had the flaw (24 per cent of all the studies). In the appendix to his paper Hyman (1985) adds that the flaw also was assigned studies in which there were inadequate precautions taken to prevent communication between the subject and the agent at the time of feedback. If such communication were possible, the agent could fraudulently misrepresent the actual target, so as to coincide with the subject's target choice. Hyman provides no estimate of how many studies contained this aspect of the flaw.

4.) Inadequate documentation was judged to have occurred when the published account of a study neglected to specify various factors which are necessary for assessing the adequacy of the study's procedures. Hyman does not specify which factors should be reported to avoid having this flaw, other than the subject/agent relationship, and relating this to the results, where possible. He estimates that 81 per cent of the unpublished studies (ie. studies published only as briefs or abstracts), and 38 per cent of those published contain this flaw.

5.) Inadequate security flaws were not completely defined by Hyman. The points which he did specify included: situations where there were not separate experimenters monitoring both the subject and the agent; and possible practices such as 'rolling a clay ball over the target' (Hyman, 1985 p. 28). He believed ten, or 24 per cent, of the studies had this flaw.

6.) Statistical errors were assigned when a statistical procedure was incorrectly used. This included using wrong degrees of freedom, incorrect pooling of data over trials, and incorrect application of a statistical method. Hyman found such errors in twelve, or 29 per cent, of the ganzfeld studies.

In determining whether the ganzfeld replication rate has been inflated by various flaws in the experiments, Hyman does not consider procedural flaws in isolation from the other six methodological flaws he identified. Three of the flaws, viz. alternative tests, multiple dependent variables, and independent judges, were eliminated from this evaluation, due to rare occurrence.

The remaining nine flaws are grouped into three clusters, and these clusters examined in relation to effect size and z score, by means of a factor analysis. One cluster, containing the flaws of feedback, randomisation, documentation, and multiple indices, did correlate significantly with both effect size and z score. From this cluster, the flaws of feedback, randomisation, and documentation contributed most strongly to the significance of the finding. Hyman then computed a larger factor analysis, taking into consideration such factors as number of trials per study, and year of the report. In this analysis, key loadings were effect size, z score, and the cluster noted above. He then performed a regression analysis to determine what the z score and effect size might be for studies which were free of the three flaws found to correlate with study outcome. The findings of this equation indicate that, if these flaws were removed from the data base, the expected z score, based on direct hits, would be zero. From this he concluded 'that the ganzfeld data base, despite initial impressions, is inadequate ... to support the contention of a repeatable study' (1985, p. 38).

Honorton (1985) limits his consideration of procedural flaws to the 28 studies included in his second meta-analysis, based on direct hits. He identifies two categories of procedural flaws in these studies: sensory cues, and randomisation. Sensory cue flaws include the use of a single target set, and contact between the sender and the subject experimenter prior to the judging. His definition of randomisation flaws was similar to Hyman's. Regarding sensory cues, Honorton found that, while studies which had the flaw were slightly more successful than those which did not, there was no significant correlation between a study's outcome and this flaw.

Similarly, randomisation flaws showed no significant correlation with study outcome. Honorton also examined whether the combined effect of these two flaws related to study outcome: using a multiple regression analysis he found no significant correlation. From this he concluded that 'there appears to be no systematic relationship between these indices of study quality and study outcomes' (1985, p. 72). Thus, Honorton's findings of a success rate of 43 per cent, with a highly significant effect size, appear to be unaffected by these flaws.

It seems surprising that two analyses, examining the same data base, should result in such disparate findings. What could account for these differences, and whose conclusions are most accurate? It is hoped that the following discussion will help to answer these questions.

It can be thought that, by limiting his analysis to 28 of the 42 studies, Honorton had eliminated studies which might have altered his findings. The author thinks that his choice of which of his two meta-analyses to use is appropriate. It is based on a single, uniform test and index (direct hits), as was Hyman's, and thus is more comparable to Hyman's analyses than the meta-analysis he conducted by means of alpha adjustment (Honorton, 1983). Furthermore, using the Bonferroni alpha adjustment method to analyse 47 ganzfeld studies, Honorton (1983) found no significant relationship between study outcome and cueing flaws, and/or randomisation flaws. Thus, it would appear that the differences between the size of Honorton's and Hyman's data base is unlikely to account for their different findings.

Hyman's analysis is based on a much more complex categorisation of flaws than is Honorton's. If Honorton is overlooking certain relevant flaws, the discrepancy in their conclusions could possibly be accounted for. Honorton does not include in his meta-analysis any of the six multiple analysis flaws which Hyman identified, whereas Hyman includes three of them in his. Honorton's reason for not including these flaws is that by using a single, uniform index in measuring all the studies' outcomes, he has eliminated any possible effects which multiple analysis could have on the data base.

This reasoning appears sound. As Hyman was also using a single, uniform measure of the studies' effect size, he should not have included these flaws in his analysis. By doing so he was, in effect, examining the data for flaws which he had already eliminated. The ´cluster´ of flaws which accounted for Hyman´s significantly relating flaws with study outcome included the flaw of multiple indices. However, Hyman specifies that the significance of his findings was mainly due to the other flaws in this cluster, viz, feedback, randomisation and documentation. Thus, it appears unlikely that multiple analysis flaws could have accounted for the differences in Honorton´s and Hyman´s findings.

An examination of the procedural flaws might clarify why the discrepancies in findings occurred. Hyman identifies six procedural flaws, three of which were identified as the primary factors which significantly related to study outcome (feedback, randomisation, and documentation). Honorton identified only two procedural flaws: sensory cueing, and randomisation; and neither related significantly to study outcome. It would appear that the differences in their findings stems from their analyses of these flaws.

Honorton´s definition of sensory cueing flaws includes the use of single target pools. Hyman has a category devoted solely to this flaw, which did not significantly relate to study outcome in his meta-analysis. Hyman´s feedback flaw category refers to two types of flaw: a) not replacing the target randomly into the target pool before judging (which could only occur when a single target pool was used); and, b) allowing the possibility of communication between the agent and the subject, at the time of feedback. As Hyman already has a category which encompasses single target pool flaws, it seems redundant to include these flaws in a second category. That objection aside, as single target flaws did not relate significantly to effect size in Hyman's analysis, the significant relation between feedback and effect size is most likely due to those studies which allowed possible communication between the sender and the subject at the time of feedback. Hyman does not specify how many studies contained this 'error'.

Honorton (1985) re-examined the data base to see if either of Hyman's feedback flaws related to study outcome. No correlation was found between replacing the target randomly into the target pool and study outcome. Regarding the second type of flaw, Honorton found that all the studies except for two (Honorton, 1976; Rogo _et al._, 1976), to which Hyman assigned this flaw, reported that an experimenter was monitoring the agent. The author's examination of the studies agrees with Honorton's on this point. As for the two exceptions, one of them had a significant outcome and the other a non-significant one: thus it seems unlikely that these two studies alone could have contributed much to the significance of Hyman's findings involving this flaw category. Experimenter fraud would be required for the other studies, in which the subject was monitored by an experimenter, to have contributed to the significance of Hyman's results. Given the above points, it is difficult to comprehend how the feedback flaw contributed to the significance of this finding, without resorting to the assumption that fraud has occurred.

The procedural flaw of randomisation was also contained in the cluster of flaws which related significantly to study outcome in Hyman´s meta-analysis. Honorton and Hyman´s definitions of this flaw were essentially the same, yet no significant relationship was observed in Honorton´s analysis. Hyman assigned this flaw to fifteen studies he estimated did not use a RNT or RNG for the target selection, and to sixteen studies which he believed did not specify how the target was selected.

The author, in examining the above studies, arrived at different findings. Two of the studies which Hyman classified as using inadequate randomisation, and ten of the studies which Hyman classified as not specifying randomisation procedures, **do** in fact specify using RNT´s or RNG´s for target selection. If the twelve studies identified by the author are subtracted from Hyman´s total, only nineteen, or 45 per cent, of the studies have not used adequate randomisation, as compared to Hyman´s finding of 31 studies, or 74 per cent.

Honorton also finds Hyman´s tally of randomisation flaws to be incorrect. He says that ´many´ of Hyman´s classifications are incorrect, and lists five specific examples from the 28 studies he examined. The apparent errors in Hyman´s classifications involve over a third of the studies with which he found fault. Furthermore, he has a separate flaw category for studies which failed to supply adequate documentation of their procedures. Thus, in including in his randomisation category those studies which did not report specific randomisation procedures, he seems to be penalising these studies twice for the same fault. If the studies which failed to specify randomisation procedures are eliminated from this category, only twelve, or 29 per cent of the data base, can still be assigned this flaw. Therefore, it could be argued that his analysis of this category involved assigning this flaw to nearly three times as many studies as was justified. This, again, casts doubt on the significance of his findings.

Hyman also specified inadequate documentation as contributing to the significant relationship between study outcome and procedural flaws. As defined by Hyman, this category does not seem to constitute a methodological flaw, unless one assumes that an experimenter was not reporting aspects of his study, intentionally to avoid detailing inadequate procedures. This reasoning suggests intentional dishonest behaviour on the part of the experimenter, and, as such, cannot be considered to be valid unless proof of such behaviour is offered.

It is, of course, desirable always to try to include in any published account of a study as many details as possible regarding procedures, subject population, and analyses. But many of these studies have only been published as briefs or abstracts, and it is not possible, in the space provided for such publications, to detail all the information which would be included in a full paper. Nor is an experimenter always likely to think that some detail, which to him seems trival, may be regarded as important by another.

Hyman´s (1985) article has provided a valuable service in pointing out the importance of including various details in any published account of a study. It is hoped that future studies will use his article as a guideline for what information to include in their write-ups. But, unless proof of intentional misrepresentation can be offered, should inadequate documentation be considered to be a methodological flaw? In light of the above comments discussing this flaw, it is the author's opinion that Hyman should not have included this category in his analysis. Whether Hyman's factor analysis would have obtained a significant result if this 'flaw' were eliminated from his analysis, is not known. But, it does raise further questions about the validity of his findings.

The other procedural flaw categories do not, by Hyman's analysis, significantly relate to study outcome. The author finds no fault with his definition of either the category of use of a single target, or with that of statistical errors. She does object to his inadequate security category. Here he defines as flawed any study which used a single experimenter design (ie. studies where there was no experimenter monitoring the agent, or where the experimenter acted as the agent). Honorton (1985) details how one study utilising a single experimenter design (Braud, Wood and Braud, 1975) provided more than adequate security. Again, the flaw assumes either poor experimental methodology or fraudulent behaviour by the experimenter. As Hyman offers no evidence that either of these possibilities occurred in these studies, the counting of single experimenter designs as inherently flawed is unsubstantiated.

The above discussion has detailed several criticisms of Hyman's meta-analysis. These criticisms involve Hyman's definition of various types of flaws, his assignment of flaws to studies, and the argument that half of the flaws he considered (eg. multiple analysis flaws) should not have been included in his analysis. Can Honorton's (1985) analysis be similarly faulted?

Honorton's definition of sensory cueing flaws includes two of Hyman's flaw categories: use of a single target pool, and security. This seems a logical definition, as both involve possibilites for the occurrence of sensory cueing. An earlier review by the author criticised Honorton's (1978) for being too lax in his criteria for sensory cues. In that review, Honorton had not counted studies which used the BTP as offering sensory cueing possibilities, even when use of duplicate BTP sets had not been specified in the study. In his 1985 analysis, Honorton has changed his definition, so as now to categorise these studies as flawed.

As mentioned, Honorton and Hyman used the same definition of randomisation flaws. In her review of the literature, the author assigned the same flaws to the same studies as did Honorton, in both flaw categories. Therefore, she does not find fault with either Honorton's definitions of flaw categories, or with his assignment of flaws to studies.

Honorton's reasons for not including multiple analysis flaws in his meta-analysis have been previously detailed and agreed with. The only procedural flaws that Hyman considered, that Honorton did not, were feedback, statistical errors, and inadequate documentation. Hyman's consideration of inadequate documentation as a flaw, it has been proposed, is inappropriate. Honorton agreed with Hyman's assignment of statistical flaws, but did not give consideration to these flaws in his analysis. But, Hyman found no significant relationship between statistical flaws (other than multiple indices) and study outcome. This may suggest that Honorton's exclusion of these flaws from his meta-analysis is unlikely to have accounted for the differences in their findings.

Hyman's feedback category was largely composed of flaws which could only occur when a single target pack was used. Thus the majority of Hyman's feedback flaws were included in Honorton's category of sensory cueing flaws. The other flaw which comprised Hyman's feedback category only occurred in two studies, one of which obtained a significant, and the other, a non-significant outcome. Again, it is unlikely that Honorton's exclusion of this flaw could have given rise to the difference in their findings. Therefore it would appear that Honorton has not excluded any relevant flaws from consideration that, if included, which would have altered the outcome of his meta-analysis.

Various problems with Hyman's examination of methodological flaws contained in the ganzfeld literature have been highlighted. The outcome of his meta-analysis therefore must be considered in relation to these problems. It is the author's belief that the problems inherent in his examination of methodological flaws cast serious doubt on the validity of his findings.

It is possible that some may object to the faults that have been found in Hyman's treatment of methodological flaws. If one accepted Hyman's examination of ganzfeld study flaws, could his meta-analysis then be viewed as valid? In his 1985 paper, Hyman criticises researchers who conduct factor analyses on sample sizes of thirty or less. The author was surprised, therefore, as indeed was Honorton (1985), to find Hyman conducting complex factor analyses on a sample of 36 studies. Due to the complexities of Hyman's analyses, Honorton (1985) sought the advice of a psychological statistician, David R. Saunders, regarding their validity.

Saunders' findings are detailed in an appendix to Honorton's (1985) ganzfeld meta-analysis. Saunders concluded that Hyman's use of factor analysis was inappropriate, due to the size of the data base, in both his smaller and larger factor analyses; and that Hyman's findings using these analyses are 'meaningless' (1985, p. 87). Saunders then considered the use of the regression equation with which Hyman found an expected z score of 0, for those studies that were free of the flaws found to relate to study outcome in his factor analysis. By considering only three of the nine flaw categories in this equation, Saunders found Hyman guilty of implicit multiple analysis, since Hyman's factor analysis could not be relied upon to select those three flaws for examination. Saunders concluded: 'under the circumstances, the multiple correlations cited above must be regarded as nonsignificant, and any interpretation drawn from them must be regarded as meaningless' (1985, p. 88).

Thus, Hyman´s findings may be rejected on the basis of inappropriate flaw categorisation, and/or inappropriate analysis. Furthermore, there appears to be no basis for rejecting Honorton´s ganzfeld findings of a highly significant effect size, with a success rate of approximately 40 per cent. Hence, for the reasons detailed above it is the author´s opinion that Honorton must, at this stage in the debate, be seen as providing a more accurate appraisal of the ganzfeld´s replication rate.

However, the most important contribution of the Honorton/Hyman debate does not, in the opinion of the author, revolve around the ganzfeld replicability question. She believes its true importance lies in the disclosure of the methodological problems which many ganzfeld studies contain. In his conclusion Hyman admits that, if examining the literature of another area of psychology, he probably would find the same flaws as those contained in the ganzfeld literature. But, simply being ´no worse than anyone else´ is not a situation from which parapsychologists should take comfort. It therefore is hoped that this debate will lead to the use of improved methodology in future parapsychological experimentation.

How significant is this apparent rate of success? It can be argued that if the ganzfeld truly was favourable to psi-functioning, an even higher success rate should be expected. Honorton (1976b) and LeShan (1966) have argued that the success rate of parapsychological research should be measured in the same manner as that of other social sciences. Honorton (1976b) has in fact estimated that the replicability record of parapsychology may be superior to that of other social sciences. Sargent (1981a) believes that the replicability rate of parapsychology is comparable to that of psychology. It may be argued that, due to the nature of psi phenomena, parapsychology needs a higher replication rate than does psychology. Regarding this argument, the author agrees with Sargent, who stated:

> Parapsychology does not need higher repeatability than psychology and it is grossly unreasonable to expect human beings to be more predictable in psi experiments than they are in psychological experiments (1981a, p. 433).

## §2.6 Why is the Ganzfeld Successful in Eliciting Psi?

The following discussion will highlight various aspects of the technique which may relate to its apparent success in eliciting ESP.

The ganzfeld was developed to facilitate the eliciting of hypnogogic imagery (Bertini *et al.*, 1972). Imagery has been identified as the most frequent means by which psi information enters the consciousness (Honorton, Tierney and Torres, 1974; George, 1982; George and Krippner, 1984). Thus the fact that the ganzfeld facilitates imagery production may be a primary reason for the technique's success. However, research directed towards trying to measure individual differences in imagery, or towards augmenting imagery to try to develop psi ability, has met with conflicting results (for a review of this work see George and Krippner, 1984). This suggests that the success of the ganzfeld is not due solely to the fact that it enhances imagery production.

The ganzfeld also induces an altered state of consciousness in the subject, similar to the hypnogogic state: psi functioning has traditionally been associated with altered states of consciousness (Parker, 1975b). But most of the reseach conducted in parapsychology has been done with subjects in a normal waking state: obviously, an altered state of consciousness is not a prerequesite for psi functioning. However, there is much work which suggests that altered states of consciousness may facilitate the occurrence of psi (Honorton, 1977; Tart, 1974). Honorton (1974) identified two conditions which he felt related to the success of altered states in enhancing psi effects: the lowering of externally-directed attention; and, in reference to alpha activity, ´relatively large and rapid shifts in state´ (p. 55).

Tart (1974) suggested that psi abilities may be a latent function in certain altered states of consciousness, and postulated (1977, 1978) possible routes of psi information flow, in both normal and altered states. In discussing these routes, he highlights how psi impressions or signals may not be noticed in normal consciousness, due to the many other things (eg., noise) to which our minds must be attending in order to maintain normal functioning. Here Tart was viewing psi impressions as being weaker, and of lower intensity, than the ´intense sensory/ evaluative/emotional experiences resulting from dealing with the external world´, and concluded that ´psi seldom functions very well in our ordinary state´ (1978, pp. 194-195). Tart and Honorton thus agree that in normal conscious states there is a ´signal to noise´ problem which may mask psi impressions. Altered states, which direct attention away from, and/or minimise, external noise sources, thus may be psi-conducive.

Tart (1977, 1978) identified a further reason why altered states of consciousness may be successful in eliciting psi. This argument is based on the concept that everyone has, to varying degrees, a fear of psi phenomena, and that this fear might have an inhibitory effect on psi scoring (Tart, 1984; Irwin, 1985). An altered state of consciousness may allow a suspension of fear, as the subject may not perceive himself as being confined by his normal identity. As Tart expressed this: ´Since we are obviously not "ourselves" any longer, much is permitted that might be threatening, silly, irrelevant, or forbidden to our ordinary self´ (1978, p. 201).

Three altered states have been proven to be particularly effective in eliciting significant psi effects. These are hypnosis (Van de Castle, 1969; Honorton, 1977), sleep (Ullman et al., 1973; Van de Castle, 1977), and the ganzfeld. Examination of these states by Braud (1975), and Honorton (1977, 1978), has led to the identification of various shared characteristics which may be psi-conducive. These will now be discussed in relation to the ganzfeld.

Braud (1975) identified seven major characteristics of of a psi-conducive syndrome:

1.) muscular relaxation;

2.) reduced physical (cortical and autonomic) arousal or activation;

3.) a reduction in sensory input and processing;

4.) an increased awareness of internal processes (eg, feelings and imagery);

5.) increased right hemisphere brain functioning;

6.) an altered view of the nature of the world; and

7.) psi must be momentarily important, as in fulfilling a need of the percipient.

The ganzfeld contains several of these characteristics.

Most studies give some instructions to subjects to relax whilst in the ganzfeld. As the subject is normally sitting in a reclining chair, or lying down, during the stimulus period, little muscular activity (other than that involved in speaking) is required. Thus, the ganzfeld provides a climate that is at least conducive to muscular relaxation. Providing the subject with homogeneous, unpatterned visual and auditory fields substantially reduces the normal sensory input from these senses. Braud (1978a) states that the ganzfeld is particularly effective in reducing such external perception stimulation. As the subjects´ only task is to report their imagery, feelings, thoughts, and sensations, their awareness of their internal processes is increased considerably.

The last characteristic specified by Braud also may be relevant, in that the subject´s goal whilst in the ganzfeld is to receive psi-mediated impressions. However, most ganzfeld protocols stress that active striving for psi impressions is likely to be counter-productive, and encourage their participants to take a passive role. Therefore the extent to which a desire for psi to be operating is a characteristic of ganzfeld experimentation is questionable.

The psi-conducive syndrome put forth by Braud has been demonstrated to contain several factors which are characteristic of the ganzfeld, but concentrates on identifying features which are conducive to the occurrence of psi functioning. Honorton (1977, 1978) has taken a different perspective in examining psi-conducive conditions, concentrating his examination on what is necessary for psi functioning to be **detected,** as opposed to Braud´s concern simply with factors which enhance its **occurrence.**

Honorton (1977, 1978) identified four conditions which are necessary for the detection and identification of psi impressions:

1.) the psi influence must be consciously detected, and experienced in such a manner that the receiver can, and does, attend to it.
2.) The experience must be sufficiently prominent to allow the receiver to distinguish it from the many other inputs which he is simultaneously experiencing.
3.) To be evidence of psi functioning, the experience must be stored, and reported, before any contact may occur between the receiver and the psi source.
4.) a meaningful correspondence between the experience and the

psi source must subsequently be confirmed.

Honorton stipulates that while the correspondence need not be exact or literal, it must be sufficient, over repeated trials, to eliminate chance occurrence as a reasonable explanation.

Having stipulated the necessary criteria for the detection and identification of psi experiences, Honorton (1977, 1978) proceeds to delineate four conditions which characterise psi-conducive altered states, and still allow for detection of the psi influence. These are:

1.) somatic (muscular) relaxation;

2.) reduction of sensory functioning;

3.) sufficient cortical arousal to maintain conscious awareness; and,

4.) directing attention to internal mentation processes, which will provide the psi data.

Three of these conditions are also mentioned in Braud's psi-conducive syndrome. In considering cortical arousal, Braud's syndrome only specifies a lowering of this activity. This is implicit in Honorton's model, but in stressing the need to maintain conscious awareness, Honorton is including the condition necessary for detection of the psi impression.

Drawing upon the factors necessary for detection of psi functioning and the conditions characteristic of psi-conducive states, Honorton (1978) finds five ways in which the ganzfeld fits these criteria. Specifically:

1.) the sensory 'noise' level is reduced, due to the homogeneous visual and auditory stimulus;

2.) attention is directed towards internal mentation processes, which may act to mediate psi input;

3.) the homogeneous visual and auditory stimuli could create a ´stimulus hunger´, which could act to facilitate a link between the receiver and the psi source;

4.) retetention of the psi information, by means of the receiver´s mentation reports;

5.) establishment of meaningful correspondences, between the psi source and receiver´s mentations, by objective measurement.

The above considerations are aimed at identifying factors of altered states which are psi-conducive. Another approach to determining psi-conducive factors would be to examine the various theories of psi-functioning, to see if any features contained within the theoretical models could be manipulated to produce a greater level of psi activity. Unfortunately, such an examination is outwith the scope of this thesis. However, one model bears special relevance to the ganzfeld. This hypothesis has recently attracted a great deal of attention from certain parapsychologists. If correct, it could help in resolving questions as to why the ganzfeld is so successful in elicitating significant psi-scoring.

The model being referred to is Stanford´s (1978) conformance behaviour model. This model ´views psi as somehow organizing loose, disorganized, or random processes such that their outcomes accord with the dispositions of someone or some organism which has an interest in or concern about those outcomes´ (Stanford, 1981, p. 1). The degree of randomness which a system exhibits, it is proposed, will correlate positively with the potential of that system to be influenced by psi. Thus, the greater the randomness of the system, the greater the potential for the interaction of psi influences. A ´system´ in this model may refer to a broad range of circumstances, from falling dice, to the human brain. Therefore the model may be applied equally to either organic or non-organic systems. However, as this discussion is concerned with the ganzfeld´s efficacy in eliciting psi from people, the consideration of Stanford´s model will be limited to that process.

The conformance behaviour model views the brain as a system which randomly scans its environment, on an unconscious level, for information which could help to satisfy its predispositions and/or needs. In this respect the model is said to be goal-oriented, in that the function of psi is to assist the brain in achieving an end. It is predicted that the more random (i.e. in less structured, or having fewer cognitive constraints) the brain functioning, the more psi influences are likely to be detected. The ganzfeld presents a subject with a noise source which is completely random, and, thus, homogeneous in nature. Could this increase the random functioning of the brain, thereby making the brain more susceptible to psi influences?

Various studies have investigated the influence of the auditory stimulus of the ganzfeld. Early work in this area by Habel (1975) compared the influence of different noise sources in the ganzfeld, and found no significant differences between them. Stanford (1979) also investigated the effect of different auditory sources. His study did not result in significant psi scoring, but the condition which utilised a random, homogeneous noise source (pink noise) was more successful than other noise types.

More recent experimentation has been directly aimed at establishing whether or not presenting the brain with a random stimulus, such as white or pink noise, decreases cognitive constraints, thereby allowing for an increase in random activity. Stanford and Roig (1982) conducted two studies in the ganzfeld, comparing the effect of pink noise to that of an electronic tone. These experiments were not measuring psi effects, but comparing whether cognitive constraints, as measured by performance on word association tests, were different between the auditory conditions. The outcomes of the studies offered some support for the cognitive-constraint hypothesis, with the pink noise condition showing a greater lowering of cognitive constraints, on several variables measured, than did the tone condition. However, not all of the predicted differences emerged from these studies.

Stanford and Angelini (1984) contrasted noise with silence in a ganzfeld ESP study. Contrary to expectations, no differences were found between the noise and silence conditions in regard to cognitive-constraint measurements. While not significant, a 'strongly suggestive' difference was found between the noise and silence conditions in ESP effects, with the noise condition almost reaching significant psi-missing. A further study, by

Stanford, Angelini, and Raphael (1985), again comparing noise and silence, found no difference between the two which related to cognitive constraints. However, they found that noise, as opposed to silence, did significantly influence cognitive processes as measured by between-subject variance. Specifically, extroverts and introverts differed, in that extroverts responded more favourably to the traditional ganzfeld noise condition than did introverts. These differences were not found in the silence condition. More research is needed to validate this finding.

Other findings relating extraversion to successful ganzfeld performance have been provided by Sargent's Cambridge Laboratory. However, Sargent's results have offered conflicting evidence (for a review of this work as related to extraversion see Stanford, 1984). If significant differences between extroverts and introverts, regarding their reaction to ganzfeld noise, are confirmed, this finding would have important implications regarding the general success of the ganzfeld.

These findings offer some support for the importance of the noise in ganzfeld success. Regarding the value of the noise in reducing cognitive constraints, the results offer little support for Stanford's conformance behaviour model. However, the findings regarding between-subject variance may reveal a potentially important relationship to the success of the ganzfeld.

The above discussion has examined various possible reasons for the apparent success of the ganzfeld. The psi-conducive conditions identified by Braud (1975) and Honorton (1977, 1978) may be related to ganzfeld success. However, these conditions have not been examined systematically to determine if, or how, they may do so. Thus, no firm claims can be made regarding their contribution to the psi-conducive aspects of the ganzfeld.

Stanford's work has considered certain possible success-related factors in a systematic way. However, his findings have been conflicting regarding the role of noise in the ganzfeld, and more research will be needed before conclusions may be drawn. Thus, no factors can, as of yet, be identified which positively relate to the success of the ganzfeld. To quote Stanford (from a paper presented to the 1985 Parapsychological Association Convention), 'essentially nothing is known of why ganzfeld might be favorable to ESP'.

## §2.7 Procedural Factors Related to Ganzfeld Success

It was proposed in the previous two sections that the ganzfeld has an impressive success rate, which does not appear to be influenced by various methodological flaws. The aim of this section is to investigate whether any factor(s) pertaining to the experimental use of the ganzfeld can be identified as relating to the success of the technique. The examination is necessary due to the variety of ways in which the ganzfeld may be applied experimentally. The Honorton and Harper (1974) study, presented in section 2.3 of this chapter, illustrates the 'typical' use of the ganzfeld technique. But in subsequent studies, the ganzfeld procedure has been subjected to a variety of manipulations. This examination was carried out in the hope that various experimental factors, or manipulations of the basic technique, could be identified as relating to either the success, or failure, of ganzfeld studies. If such factors were discovered, they could then be included in the design of the ganzfeld studies conducted for this thesis.

In the course of the work for this thesis two examinations of this type have been conducted. The first was made in 1980, prior to conducting Experiment I (reported in Chapter 4). The second review was carried out in 1983-84, prior to conducting Experiment III (reported in Chapter 6). The latter review was more comprehensive than the former, encompassing a larger data base, and considering more factors. Thus the presentation of the first examination will be brief, to avoid later repetition.

When this first survey of the ganzfeld literature was conducted, in 1980, Honorton (1977, 1978) had published the only detailed reviews of the ganzfeld literature. This survey was based on Honorton's 1978 review, as it contained more studies than the 1977 one. Honorton (1978) claimed to be reviewing 26 studies. The author was able to count only 25, using his references. One of his reported studies did not appear to have been published and thus was excluded from consideration, as no information regarding it was available.

The same method used by Honorton (1978) was employed to determine which studies had significant outcomes. Thus successful experiments were considered to be those which had obtained significant, above-chance psi scoring, while if a study did not result in significant psi scoring it was considered to be unsuccessful. The studies surveyed are listed in Table 2.1. This survey was a descriptive, non-statistical examination.

Table 2.1: Studies Comprising the Data Base for the First Examination of Factors Relating to Ganzfeld Success

| Successful Studies | Unsuccessful Studies |
|---|---|
| Braud, Wood & Braud, 1975 | Habel, 1976 |
| Braud & Wood, 1977 | Palmer & Aued, 1975 |
| Dunne, Warnock & Bisha 1977 | Palmer, Bogart, Jones & Tart, 1977 |
| Honorton, 1976 | Parker, 1975a |
| Honorton & Harper, 1974 | Parker, Millar & Beloff, 1977 |
| Raburn & Manning, 1977 | Rogo, Exp.1, 1976a |
| Schmitt & Stanford, 1978 | Rogo, Exp.2, 1976a |
| Smith, Tremmel & Honorton, 1976 | Rogo, Smith & Terry, 1976 |
| Sondow, 1979 | Stanford & Neylon, 1975 |
| Terry & Honorton, Exp.1, 1976 | Terry, 1976 |
| Terry & Honorton, Exp.2, 1976 | Wood, Kirk & Braud, 1977 |
| Terry et al., 1976 | |
| York, 1977 | |

The various factors examined in this survey were: type of target material; length of ganzfeld stimulation; colour of visual stimulus; type of auditory stimulus; length of the sending period; whether relaxation instructions were given prior to the stimulus period; and the use of duplicate target packs. No noteworthy differences between the successful and unsucessful studies were found in the categories of type of target material used, type of auditory stimulus, or length of the sending period. All but one of the sucessful experiments specified giving some, however brief, instructions to their subjects to try to relax whilst in the ganzfeld. Ten of the successful studies specifed the colour of the visual field presented to the subject. Of these, eighty per cent employed a red field.

The majority of the non-significant studies did not specify whether or not their subjects received relaxation instructions, and only six of the unsuccessful experiments gave details regarding the colour of the visual stimulus. Thus, for these categories, it was felt that there was not enough data provided by the unsuccessful studies to allow a meaningful comparison to be made.

In keeping with Honorton's 1977 findings, the successful studies were found to have used a longer duration of ganzfeld stimulus. The average time spent in the ganzfeld, in the nine successful studies which specified this factor, was 32 minutes. The ten non-significant studies which reported this information averaged 26 minutes. Eighty-two per cent of the significant studies, as opposed to 60 per cent of the unsuccessful experiments, utilised 30 minute or longer stimulus period durations. While these differences are not as marked as those observed by Honorton (1977), they do lend some support to the concept that the duration of the ganzfeld stimulus period should be at least 30 minutes to optimise the probability of significant psi scoring.

The author's first review may be criticised for accepting the significance levels reported in the studies concerned. Thus it did not take into account the fact that the results may have been inflated due to multiple analysis.

The second review was conducted for three reasons. Firstly, by accepting the published levels of significance, studies may have been categorised as successful when they should have been classified as unsuccessful. Thus the findings from the first survey may have been inaccurate. Secondly, the data base had grown by this time, and new relationships between success and various experimental factors might be revealed in the more recent studies. Thirdly, the first two experiments conducted for this thesis had not obtained significant scoring. By examining a larger number of factors relevant to the design of these studies, it was hoped that some factor relating to success might be revealed which was missing from the design of Experiments I and II.

By the time the second examination of the ganzfeld data base was made, the Honorton/Hyman debate had begun. In the early stages of this debate Honorton was basing his meta-analysis on 48 studies of which he had knowledge, and was using the Bonferroni method to correct for multiple analysis. Hyman's meta-analysis was restricted to the 42 studies with which Honorton had orginally provided him. His calculations of study outcome were carried out in the same manner as his 1985 analysis, which has been considered previously. As has already been discussed above, Hyman objected to Honorton's classification of significant and non-significant studies obtained from making alpha adjustments to correct for multiple analysis. As Hyman's analysis was derived directly from the raw data provided by the studies under consideration, it was not open to the same criticisms as was Honorton's. Due to the controversy surrounding Honorton's method of determining study outcome, the author's second analysis is based on Hyman's classification of significant and non-significant studies.

Six of the 42 studies in Hyman's data base did not provide the data necessary for re-evaulation of study outcome. Thus this analysis was based on the 36 studies for which such re-calculations were possible. One of the studies (Child and Levi, 1979) included in Hyman's analysis attained significant below-chance scoring (psi-missing). Due to interest in finding factors related to positive above-chance scoring (psi-hitting), as opposed to psi-missing, this study is included, for the purpose of this review, in the classification of non-significant studies.

Also included in the list of signigificant studies are four experiments which reached one-tailed significance, but not two-tailed. Hyman (1984) argues that only two-tailed tests should be used in ganzfeld experimentation. His reason for this is based on suspicions that an experimenter will use, _post hoc_, either a one- or a two-tailed test, dependent upon the direction of the results. The four experiments (Sargent, Exp. II, 1980a; Sargent, Exp. III, 1980a; Terry and Honorton, Exp. I, 1976; and Terry _et al._, 1976) involved in this instance should not, in the author's opinion, be accused of this practice. Sargent is always careful to stipulate that he expects positive results, and therefore consistantly uses one-tailed tests in his experiments. While Terry and Honorton (1976) and Terry _et al_. (1976) did not explicitly state in their reports whether they would use a one- or two-tailed level of significance, they both reported one-tailed tests, even though their results (as reported) were significant at the two-tailed level. For these reasons these four experiments will be considered to have achieved significant results. Table 2.2 presents a list of the studies which will be considered to be successful (ie, significant results) and those which will be treated as unsuccessful studies (non-significant results).

Table 2.2: List of Studies Comprising the Data Base for the Second Examination of Factors Relating to Ganzfeld Success

| Significant Studies | Non-significant Studies |
| --- | --- |
| Ashton et al., 1981 | Braud, Wood & Braud, 1975 |
| Honorton & Harper, 1974 | Braud & Wood, 1977 |
| Honorton, 1976 | Child & Levi, 1979 |
| Raburn & Manning, 1977 | Habel, 1976 |
| Sargent, Exp. II, 1980a | Palmer & Aued, 1975 |
| Sargent, Exp. III, 1980a | Palmer et al., 1977 |
| Sargent, Exp. V, 1980a | Palmer, Khamashta & Israelson, 1979 |
| Sargent & Matthews, 1982 | Parker, 1975a |
| Schmitt & Stanford, 1978 | Raburn & Manning, 1977 |
| Smith, Tremmel & Honorton, 1976 | Rogo, Exp. I, 1976a |
| Sondow, 1979 | Rogo, Exp. II. 1976a |
| Terry & Honorton, Exp. I, 1976 | Rogo, 1977 |
| Terry & Honorton, Exp. II, 1976 | Rogo, Smith & Terry, 1976 |
| Terry et al., 1976 | Roney-Dougal, 1982 |
| York, 1976 | Sargent, Exp. I, 1980a |
| | Sargent, Exp. VI, 1980a |
| | Sargent, Bartlett & Moss, 1982 |
| | Sargent et al., 1981 |
| | Sondow, Braud & Barker, 1982 |
| | Terry, 1976 |
| | Wood, Kirk & Braud, 1977 |

This analysis, conducted in preparation for Experiment III of this thesis, is intended to provide a descriptive and informative examination of factors which may relate to ganzfeld success. It is not meant to be inferential. The reasons for this are two-fold: first, sixteen of the 36 studies to be examined were published only as abstracts or briefs. Thus many of the reports did not provide information regarding the various factors which the author wished to examine. Where such details were not reported, those studies were not included in that particular analysis. Therefore, these analyses cannot be seen as truly representative of all the ganzfeld studies included in the data base of the review.

The second reason involves matters of personal decision. In many cases the information provided by the reports of these studies was vague. In these situations decisions had to be made as to how to categorise an ambiguously, or an incompletely reported, factor. For example, if a study said that a subject received 'visual ganzfeld stimulus,' does this mean that they were presented with a red visual field? In such cases a strict attitude was adopted, of assigning the study to the 'minimal' category unless knowledge to the contrary was available from other sources (either published or personal). Therefore, the above example would be categorised as not specifying the colour of the visual field. Thus, other researchers may disagree with some of the classifications which have been made. For these reasons, this analysis is not intended to provide definitive inferences.

The chi-square test for two independent samples or the Fisher exact probability test was used, depending upon the sample size of the factor under consideration (Siegal, 1956), to examine if a significant association existed between study outcome and the factor. All analyses were two-tailed. There were several occasions on which several categorisations for the same variable could be found. For example, in Habel (1976) full ganzfeld stimulation was used in one condition, but only partial stimulation in others. It was decided to treat cells which differed from each other, as in Habel´s paper, as separate experiments. Therefore, for Habel´s study, the two conditions with partial stimulation were treated as one experiment, and that utilising full ganzfeld stimulation as another. This procedure does not influence the outcome of the analysis, as no experiment was judged as having significant results in one condition and not in another; with the exception of Raburn and Manning´s (1977) study, which was treated as two different experiments for the reasons given in section 2.5.

Not one of the factors under consideration related significantly to study outcome. Nonetheless, some trends did emerge, and the factors examined will be briefly discussed to highlight these trends.

The first aspect examined was whether the use of full, as compared to partial ganzfeld stimulation related to study outcome. Full ganzfeld stimulation refers to use of both auditory and visual homogeneous fields during the stimulus period. While the majority of both significant and non-significant studies used full stimulation, only one significant study used partial stimulation (York, 1976), whereas four non-significant studies did so. While far from conclusive, this may suggest that full stimulation is more apt to produce psi-hitting than is partial stimulation.

The duration of the stimulus period has already been noted as relating significantly to study outcome (Honorton, 1977). However, Parker (1980), examining a larger data base than had Honorton, found that this relationship was no longer significant, with only a three minute, forty second difference between the mean duration of significant and non-significant studies. In this survey's data base the mean duration, in the eleven significant studies which reported this detail, was 32 minutes and 3 seconds, and that of the twenty non-significant studies, 28 minutes and one second; a finding similar to Parker's.

To further investigate the possible effects of stimulus duration on study outcome, the studies using a stimulus duration of thirty minutes or longer were compared to those using a duration of less than thirty minutes. Only one successful study (0.09 per cent of these studies) reported using a stimulus period less than thirty minutes, whereas six non-significant studies (thirty per cent) did so. Thus significant studies have tended to use a longer stimulus period than non-significant studies: the effect of stimulus duration on ganzfeld success is discussed in greater detail in Chapter 5.

The colour of the visual field presented to the subject also may be an important factor in ganzfeld success. The early work with the ganzfeld, by perceptual psychologists, showed that visual adaptation (a change in the perceived coulour) to the ganzfeld was most rapid using a red stimulus. The previously mentioned findings of Hochberg et al. (1958) demonstrated that subjects experienced a more rapid colour adaptation with a red light source than with a green one. Weintraub (cited in Avant, 1965) found that the speed of adaptation increased in accordance to the degree of purity of the red source (ie, the greater the purity, the shorter the adaptation time). These findings suggest that a red light source provides a more complete, and/or more rapid, attainment of the ganzfeld state of altered consciousness. As the inducement of an altered state may be a contributing factor to the technique's success, the colour of the light source used may, therefore, be an important factor.

To examine this possibility, the studies were classified according to those which used a red light source, and those using other sources. All of the successful experiments which reported light colour used a red visual field. Of the fifteen unsuccessful studies, ten (67 per cent) reported using a red light source, and five (33 per cent) used a visual field other than red. These figures suggest that the use of a red light source may help to optimise the conditions for significant psi-scoring in ganzfeld studies.

The type of auditory stimulus used also may play a role in ganzfeld success. Two experiments contained in the data base have examined the role of the auditory stimulus, investigating the importance of the homogeneity of the stimulus. Habel (1975) contrasted psi performance under three different auditory stimuli: white noise; a slow drumbeat; and Ravel's 'Bolero'. The overall results were non-significant, and there was no significant difference between the conditions. However, Habel stressed that the conditions under which the experiment was conducted were extremely difficult, and that morale among the experimenters deteriorated to a very low level: Habel believes that these may have been the reasons for the lack of significant scoring.

Stanford (1979) used pink noise, and an electronic organ note, as the auditory stimuli in his study, and examined the influence of creating an interruption during the stimulus. The report is not included in the data base, as it did not include the data necessary for Hyman to compute its effect size. While the results of this study were not significant, the uninterrupted pink noise did elict higher psi-scoring than did the uninterrupted organ note, and the uninterrupted pink noise produced greater psi-scoring than did the interrupted pink noise. Stanford's findings suggest that the homogeneity of the auditory stimulus may be a contributory factor to study outcome.

In this analysis those studies which employed white noise were compared to those using any other auditory stimulus. Fourteen successful studies detailed the type of auditory stimulus used, of which thirteen used white noise, and only one (Honorton and Harper, 1974) used another source. Of the unsuccessful studies, fifteen reported using white noise, while five reported using another noise source. It should be noted that, in this analysis, pink noise was classified separately from white noise. It could be argued that the difference between pink and white noise is minimal, and that they should have been classified together, as they both provide an homogeneous, unpatterned stimulus. They were classified separately because all three studies which used pink noise obtained non-significant outcomes. Thus, for the purposes of trying to isolate factors which related to study success, it seemed appropriate to separate the two noise types. However, given the non-significant outcome of this analysis, it would have made no difference to have categorised the two together.

The factors considered thus far can be considered to be those which compose the basic ganzfeld ´recipe´, and, as such, are quite relevant to this thesis´ experimental use of the ganzfeld. However, the design of Experiments I and II did not differ from the normal ganzfeld as concerns the above-mentioned factors. The other factors considered in this analysis were those which may differentiate Experiments I and II from other ganzfeld work.

There are several ways in which the designs of Experiments I and II differ from the typical ganzfeld experiment. These include: the number of subjects tested; the number of sessions each subject took part in; the number of experimenters conducting the study; the agent hearing the subject´s mentations as they were made; the length of the sending period; and the subject´s mentations not being recorded and then reviewed with the subject by a subject experimenter, during or prior to the judging.

Of the 35 studies that reported the number of subjects tested only seventeen per cent, or six studies, used fewer than ten. Of these, two obtained significant results (fourteen per cent of all the successful studies), and four received non-significant outcomes (nineteen per cent of all unsuccessful studies). The difference, of five per cent, between the significant and non-significant studies using fewer than ten subjects is minimal, and offers no suggestion as to the optimal number of subjects for ganzfeld work.

Fourteen successful studies reported the number of sessions each subject participated in. Of these, five, or 36 per cent, used a multi-session design; ie, the subjects took part in more than one session. All 21 of the unsuccessful studies reported this information, of which eight, or 38 per cent, had their subjects participating in more than one session. If this analysis is limited to include only those studies which utilised eight or more sessions per subject, the same percentage (fourteen) of successful as unsuccessful studies had this feature. Thus the ganzfeld data base provides no suggestions as to the effect a multiple-session design may have on study outcome.

Another departure from the norm concerned the length of the sending period. Only two studies, both non-significant, used the entire stimulation period for sending. However, a further two studies, one significant and the other non-significant, used a twenty minute sending period, with a variable-duration stimulus period. In both of these latter studies (Sargent, Exp. VI, 1980a; Ashton et al., 1981), information was provided which indicated that the stimulus period was of the same duration as the sending period, at least for some of the sessions in each experiment.

The approximate mean length of the sending period for the successful experiments was eleven minutes, with seven studies using ten minutes or less, and five using more than ten minutes. The approximate mean duration of the sending period for the unsuccessful studies was ten minutes, with fifteen studies using ten minutes or less, and five using more than ten minutes. This may suggest that a sending period of at least fifteen minutes will help to optimise conditions for ganzfeld success. But as the outcome of this analysis was non-significant, the results of these studies can not be seen as offerring any firm evidence as to the optimum length of the sending period, or its relationship with the length of the stimulus period.

The other three factors of special relevance to the studies conducted for this thesis all stem from the use of a single experimenter design: viz., the number of experimenters conducting the study, the experimenter also acting as the agent, and not using a subject experimenter to record and review the subjects' mentations.

Hyman (1985) has criticised single experimenter designs, on the basis that they do not offer proper security precautions. However, Hyman did not find this 'flaw' correlated significantly with study outcome. In this analysis seventeen per cent, or two of the twelve successful studies reporting the number of experimenters, used a single experimenter design. Of the unsuccessful studies, six, or 28 per cent, of the 21 experiments which provided this information, had only one experimenter. Thus, the experiments which Hyman postulated may have been open to security defects attained non-significant results more frequently than significant outcomes. These figures suggest that, far from leading to inflated significance levels, studies using a single experimenter design have tended to obtain non-significant results.

Of the eleven successful experiments which reported whether or not the agent was able to hear the subjects´ mentations, only one, (nine per cent) permitted such communication. Of the fourteen unsuccessful studies reporting this information, five, (36 per cent) allowed the agent to hear the mentation reports as they were being made. While this factor does not relate significantly with study outcome, five times as many non-significant studies incorporated this factor into their design as did significant studies.

Five experiments in the data base did not have an experimenter record the subject´s mentations. Four of these studies (Braud, Wood and Braud, 1975; Parker, 1975a; Rogo, Exp. II, 1976a; and Wood, Kirk and Braud, 1977) reported that there was no subject experimenter present during the judging. The other (Habel, 1979) did not report whether or not an experimenter was present at the judging. In the Habel, Parker, and Rogo studies, the subjects did not review their mentations, before or during the judging. In the Braud <u>et al</u>. and Wood <u>et al</u>. studies the subjects were instructed to write down their mentations immediately after the sending period, and to review these during the judging. All of these studies were unsuccessful.

Three of the above experiments offered the subjects no review of their mentations, and the remaining two provided the subjects with no record of their mentations other than what they could remember. Out of the nineteen non-significant studies reporting this information, five did not have a subject experimenter record the subject´s mentations and subsequently review them with the subject for judging. All of the fourteen significant experiments reporting this information had a subject experimenter recording mentations, and reviewing them with the subject, during the judging procedure.

The above findings could be seem to argue in favour of having a subject experimenter to record, and then review, the subject´s mentations. However, it may be that the crucial factor in this analysis is not the presence of a subject experimenter, but rather the necessity of providing the subjects with an opportunity to review a thorough report of their mentations, for the judging procedure. Given that such an opportunity is provided for subjects to review their mentations, the subject experimenter (theoretically at least) should have no influence on study outcome. But is this the case? Unfortunately, none of the studies in the data base used a ganzfeld design which provided the subjects with a thorough review of their mentations, without also using a subject experimenter, so no anaylsis could be made examining this point.

This examination of the ganzfeld literature has shown no significant relationships between the factors examined and study outcome. In considering the various ´trends´ disclosed by the analysis, the only factor which occurred suggestively more frequently in the unsuccessful than in the successful studies was the agent hearing mentations as they were being made.

It could be argued that, by looking at each factor in isolation from the others, relationships which may exist between an interaction of these factors and study outcome have been overlooked. However, the data base provided by the studies is too small to allow a factor analysis, which might disclose such interactions.

How These Factors Relate to Experiments I and II

Experiments I and II did not differ from the norm as regards the basic ganzfeld ´recipe´. Full ganzfeld stimulation was used, as it was in 83 per cent of the studies examined above. A stimulus duration of at least thirty minutes was employed, as was the case in 77 per cent of the studies in the data base of the second survey. Lastly, the visual stimulation used a red field and the auditory stimulus consisted of white noise, as did 77 and 82 per cent, respectively, of the ganzfeld data base.

One factor under consideration in the above examination concerned the practice of enabling the agent to hear the subject´s mentations whilst he or she (the agent) is sending. The reasons for doing this in Experiments I and II were derived from having the experimenter also act as the agent. Experimenter motivation has often been cited as playing an important role in parapsychological experimentation (see White, 1976c, 1977a). In both of these two studies it was thought that hearing the subject´s mentations, as they were being made, would keep the experimenter/agent very involved in the sending procedure. It also served to relay apparent correspondences between the subject´s mentations and the target to the agent/experimenter. Both of these features served to keep the experimenter´s motivation at a high level.

A second reason for conveying the subject´s mentations to the agent/experimenter was derived from not using a subject experimenter. There needed to be some means by which the subject could communicate with the experimenter, to relay any problems which might arise during the stimulus period. Furthermore, it was thought that the subjects might be more comfortable knowing that there was someone monitoring their well-being during the stimulus period. Both these ends were accomplished by having the subjects´ mentations simultaneously relayed to the agent/experimenter.

The above survey raised the tenative possibility that having the subjects hear the agents mentations, may be non-conducive to psi-scoring. Whilst this suggestion is not based on a significant difference between successful and unsuccessful studies, it nonetheless represented the strongest trend suggested by the above examination of factors related to ganzfeld success. As both Experiments I and II allowed the agent to hear the subjects´ mentations, and as neither of these studies obtained significant psi-scoring, it was thought that this may have possibly contributed to the lack of significant scoring in the first two studies. Therefore, in the third study, presented in Chapter Six, the agent was not able to hear the subjects´ mentations.

In regard to having a subject experimenter, the circumstances of Experiments I and II did not allow the possibility of having a subject experimenter. In Experiment I, all the available possible experimenters in the parapsychology laboratory were also participants. When Experiment II was conducted, the author was the only experimenter available.

The findings from the above survey suggested that, contrary to Hyman's suggestion, using a single experimenter design does not tend to lead to successful experimental outcomes. One possible reason for the above could stem from a factor under consideration in the analysis: having a subject experimenter record the subjects' mentations, and then review them with the subjects, prior to or during the judging procedure. In the typical ganzfeld experiment, an experimenter will copy the subject's mentations as they are being made, and then re-read these to the subject at some point during the judging procedure. As mentioned, the personnel was not available to allow a subject experimenter to be incorporated into the design of these studies. However, the author also felt that the use of subject experimenters was not necessarily beneficial to ganzfeld experimentation.

The use of subject experimenters could insert into ganzfeld studies three factors which could adversely influence or confound study outcome. Firstly, as pointed out by Hyman (1985), the subject experimenter may not be able to transcribe accurately all of the subjects' mentations: none of the above studies specified using a subject experimenter who was capable of short-hand writing. As the subjects may have been speaking rapidly at various times whilst making their mentations, it is possible that the transcribed mentation report did not present entirely accurate accounts of what the subjects actually said. Furthermore, a subject's speech may become slurred and indistinct in the ganzfeld. This could lead to the subject experimenter missing, or incorrectly reporting, the subject's mentations. If, as is commonly the case, the subject's only review of his mentations is via the subject experimenter's mentation transcription, a loss of information could occur. It seems logical that this could lead towards a lower psi-scoring rate, although no data exists either to support or to reject this possibility.

The second factor involving subject experimenters' possible influences entails their psi interacting in the experiment. This could occur at two points in the ganzfeld procedure. Firstly, the ESP of the subject experimenter could provide some information relevant to the target which could, unconsciously, affect the subject experimenter's transcription of the subject's mentations. Secondly, the subject experimenter could unconsciously use information gained about the target via his ESP, to 'guide' the subject towards making correspondence decisions, during the judging procedure, which the subject would not have otherwise made. Of course, it is entirely conjecture whether or not this occurs in ganzfeld studies. Even if this factor could be proven relevant to ganzfeld studies, the problem of identifying 'whose psi scoring is being measured' occurs in all parapsychological research. Indeed, it has been argued that all psi obtained in an experiment is due to the experimenter (Palmer, 1978; White, 1966a, 1977). There is, as of yet, no answer to this problem. However, the presence of a subject experimenter seems to add an additional, and unneccessary, possible psi source.

The third possible manner in which a subject experimenter might influence a studies outcome is: if the subject experimenter is present during the judging, he or she may notice correspondences between the mentation report and various pictures in the target pool, which the subject failed to notice. He could then lead the subject, either consciously or unconsciously, towards certain judging decisions which the subject would not have made if left to his own devices. This would be especially likely to occur in cases where the subject was an inexperienced judge. In such situations the subject would be inclined to look to the subject experimenter in hope of receiving some guidance regarding his judging decisions. Some experimenters have reported that their subject experimenters actually take an active role in helping the subject judge their transcripts (Sargent, 1980a). However, even in situations where a subject experimenter was trying to be as noncommittal as he could, it seems quite possible that some indication, however unconsciously offered, of his opinion regarding the subject´s judging decisions, would be noticed by the subject. This raises the question as to what influence a subject experiment might have on a subjects judging: would the subject experimenter be a better or worse judge than the subject?

The subject experimenter could be viewed as an experienced judge, in that he probably has been present at several judging procedures, and has learned by experience what may be considered to be good, or successful, judging strategies. In the majority of ganzfeld studies the subjects have had no prior ganzfeld experience, and thus may be considered to be inexperienced, or naive, judges. While little research has been done regarding the benefits of skilled (ie, experienced) versus naive judges, a few ganzfeld studies, which have utilised both subject and independent judges have shown differing results between the two. In Palmer, Khamashta and Israelson's (1979) study, two independent judges revealed a greater level of psi-hitting than the judging by the subjects. However, Sondow (1979), Sargent, Bartlett and Moss (1982), and Child and Levi (1980) obtained a greater degree of psi-scoring from their subjects' judging, than from that of their independent judges. It should be noted that the independent judges used by Child and Levi were not experienced judges, nor did they know that they were judging transcripts from an ESP study.

A further finding from the Sargent, Bartlett, and Moss study demonstrated that the results from the independent judge correlated significantly with those of experienced subjects, but not with those of naive subjects. These experiments offer little conclusive evidence regarding whether independent, skilled judges may be better judges than are subjects. Thus there is no indication that contributions from a subject experimenter would either increase or decrease the scoring rate of the subject.

The possible influences of a subject experimenter discussed above are all conjectural. Nevertheless, by incorporating a subject experimenter into the design of ganzfeld studies, the possibility of such influences being exerted exists.

## §2.8 Concluding Comments

Much of this chapter has been concerned with attempts to evaluate the body of ganzfeld studies. Several different approaches to assessing a line of research have been discussed. Regardless of what conclusions have been drawn from the various analyses considered, how useful are these approaches in evaluating a line of research?

The approach, utilised by Honorton in his earlier reviews (Honorton, 1977 and 1978), of basing evaluations of a line of research upon the studies' published results is of limited usefulness. Such an approach may allow for suggestive conclusions to be drawn. But, as the reported results of the studies may have been inflated due to various methodological flaws, no firm conclusions can be drawn from such an evaluation.

If a common index can be found by which all the studies in a line of research can be evaluated, independently from the studies' reported outcome, then some of the above problems may be solved. Specifically, flaws having to do with the statistical analysis of the study, can be eliminated as a possibly inflationary factor. If a common index is found, a meta-analysis can be conducted to determine if other methodological flaws appear to be related to study outcome. However, as illustrated by the Honorton/Hyman debate, differences of opinion in defining and assigning flaws may occur using this method. These differences may lead to substantially different outcomes, as was the case in Honorton's and Hyman's meta-analyses.

Meta-analysis may be used to examine many factors other than methodological flaws. The analyses carried out by the author which attempted to isolate applications of the ganzfeld technique which correlated with study success is one example of different ways that meta-analysis may be used. Yet, these other applications of meta-analysis are open to the same difficulties encountered by Honorton and Hyman. In the case of the analyses conducted by the author, the definition of factors examined and the categorisation of studies according to these factors is relatively subjective. Another researcher, examining the same factors within the same data-base could arrive at different conclusions.

Given the apparently subjective nature of meta-analysis, how valuable is it as a tool for evaluating a line of research. One way to answer this question is to evaluate the usefulness of Honorton's and Hyman's ganzfeld meta-analyses. As previously stated, the author believes the most important contribution of these analyses was to highlight various methodological flaws contained in the ganzfeld studies. But, this was not the intended result of these analyses. Both Honorton and Hyman undertook these meta-analyses in hopes of establishing the replicability rate of the ganzfeld. The author believes that Honorton's meta-analysis does not contain various categorisation and statistical errors found in Hyman's analyses, for reasons previously considered in detail. Therefore, it is the opinion of the present author that Honorton's estimate of the ganzfeld replicability rate is based on firmer ground than is Hyman's. However, others may, and undoubtably will, disagree with these conclusions. The Honorton and Hyman meta-analyses have not succeeded in reaching any consensus regarding their objective.

Does the Honorton/Hyman debate indicate that meta-analysis is not a particularly useful means of evaluating a line of research? This debate was plagued by two problems which greatly undermined the possible effectiveness of a meta-analysis. Firstly, the authors were apparently unable to agree upon the definitions of the factors (i.e. flaws) examined and differed substantially in their categorisation of the ganzfeld studies according to the factors under consideration. This problem of differing interpretations of the data-base is a potential difficulty in any meta-analysis, which could undermine the possible effectiveness of the analysis.

The second problem encountered in the Honorton/Hyman meta-analyses concerned the size of the data-base. The 36 studies comprising Hyman's data-base was too small to allow for a meaningful factor analysis from which overall conclusions could have been drawn. Furthermore, several of the factors under examination did not apply to enough studies to permit these factors to be included in any analysis. If meta-analysis was applied to a larger data-base, these problems could be largely overcome.

Thus, the failure of meta-analysis to provide any consensual conclusions as to the replicability rate of the ganzfeld could be due to problems particular to the Honorton/Hyman debate. If these problems could be overcome, meta-analysis has the potential to provide a productive means of evaluating a line of research.

Would a future meta-analysis of ganzfeld studies be able to overcome the problems encountered by Honorton and Hyman? The size of the ganzfeld data-base has now grow to include 72 studies as counted by the author (see Appendix I). With further ganzfeld studies being produced each year, the size of the data-base need no longer present a problem. It may be that interpretational problems could increase with a larger data-base. If this were the case then it is possible that meta-analysis, when applied to a body of research as complex and varied as the ganzfeld data-base, may never succeed in arriving at generally agreed upon conclusions (Honorton (1982a, 1982b, 1983, 1985) and Hyman (1982, 1983a, 1983b, 1984, 1985) were unable to reach agreement after having exchanged several hundred pages of discourse regarding interpretational differences). In the author's opinion, the most productive approach to answering questions such as those regarding the replication rate of the ganzfeld may lie in the production of more, methodologically sound, studies. Through further experimentation answers to such questions may become increasingly self-evident.

# CHAPTER THREE

# THE TRAINING OF ESP

## §3.1 Introduction

This chapter will review various experimental studies which deal with the development of ESP ability. Such experimentation can be generally characterised by two different approaches to ESP training. The first of these involves the utilisation of psi-conducive states of consciousness, and/or training, to develop skills which may be related to psi ability. The psi-conducive state used most commonly in ESP training research is relaxation, though work has also been done using hypnosis, and the ganzfeld. Concentration, and the ability to produce mental imagery (visualisation skills), are the skills which subjects have been trained to develop in trying to improve psi ability. The first method to use this approach was compiled by White (1964), from reports made by ′gifted′ subjects. White′s training method, ′the waiting technique′, will be used to exemplify this approach to ESP training.

The second approach is based on psychological learning theory; specifically, operant conditioning. It was first presented as an ESP training method by Tart (1966). It utilises immediate feedback, to reinforce correct ESP responses. Tart believes that, given appropriate conditions, this should develop psi ability in the same manner that other animals ′learn′ by means of feedback training.

Neither of these training approaches is mutually exclusive. Many studies have been conducted using a combination of the two, and some of these will be discussed later in this chapter.

Previous training studies have generally concentrated on learning to identify ESP-mediated impressions, **before** making a response to the target. Thus they have been primarily concerned with recognising the response as it enters the conscious mind. Such responses may be thought of as cognitive responses. The studies conducted for this thesis have been primarily centred on recognising the possible ESP content of responses **after** they have been made. This type of response may be defined as behavioural, as opposed to cognitive. Thus these experiments have been directed not towards the recognition of ESP responses as they enter the consciousness, but rather with the recognition of such reponses at a later stage, ie, once they have been formally stated. This approach was adopted due to the occurrence, noted in many studies, of various content ´errors´ in ESP responses.

Experiments II and III of this thesis were aimed at training the subject to recognise these errors, if they occurred. It was thought that if the errors could be identified as such, more of the target-related ESP content in the subjects´ responses could be recognised by them. This could result in an improvement in ESP scoring. Therefore, while presenting the approach to ESP training adopted for this thesis, the types of errors commonly found in free-response studies will be examined; where ´free-response´ is used to mean that 'the range of possible targets is relatively unlimited and is unknown to the percipient, thus permitting them to respond freely with whatever impressions come to mind' (Thalbourne, 1982, p. 28).

The contents of this chapter will be necessarily limited to consideration of factors most central to the experiments conducted for this thesis. The experimentation to be considered will be those studies which directly examined the training of ESP ability. As all the studies presented in this thesis used a free-response method, the consideration of error types will also be limited, to those commonly associated with this type of method.

Throughout history many cultures have devised means by which individuals may come to possess various psychic abilities. As it is far outwith the scope of this thesis to examine all these many approaches, the interested reader is referred to Mishlove's (1983) book Psi Development Systems. The book examines the training systems of pre-scientific traditions, current 'popular' methods for developing psi ability, and parapsychological experiments.

The final section of this chapter will examine some of the various ethical issues raised by the ESP training studies conducted for this thesis.

§3.2 The Waiting Technique

White (1964) developed a training model based on 'the assumption that the best way to discover the manner of response, most likely to succeed in ESP experiments, is to learn how it "feels" from the percipient´s point of view´ (p. 24). White published this technique because she felt that inadequate attention was being paid in recent ESP experimentation to subjects´ subjective states when making responses. In the early days of psychical research, the state of the subject was given great consideration, and described in detail in experimental reports. The early investigators indicated that they encouraged their subjects to follow a fairly ritualised, subjective procedure when making responses. Many of these ´star´ subjects stressed the importance of exactly adhering to these ritualistic procedures, in order to succeed in gaining a correct ESP impression (Sinclair, 1930/1962).

In more recent work the subjective state of the subject when making reponses has been rarely, if at all, addressed. White believes this to be an unfortuate situation, the result, primarily, of the relatively rigid nature of quantitative experimentation. Thus, as the subjective state is by nature very difficult to measure objectively, it was being ignored by experimenters working under the current objective, quantitative scientific approach to parapsychology.

To redress matters, White reviewed the early literature, examining the way in which apparently gifted subjects responded to targets. From these reports, she developed a four step method which seemed to represent the general approach taken to receiving responses by these skilled subjects. White stresses that these steps are not meant to be adhered to rigidly, but rather should be taken as general guidelines. The steps are geared towards making conscious the spontaneous, unconscious, response. To aid this, the subject must remember that he does not know, nor will be able to discover, the target identity by any sensory or rational means. He is therefore thrown back onto his non-rational resources. White hopes that by following the method's four stages, the contents of the unconscious will be made conscious, thereby eliminating the guesswork from response making.

The four steps are: 1) relaxation; 2) engaging the conscious mind, and, 2a) the demand; 3) the waiting, the tension, and the release; and, 4) the way the response enters consciousness. The details involved in each step are as follows:

1) Relaxation: this stage emphasises the need to establish a state of complete relaxation, by means of a thorough relaxation exercise. This step is most important, and considerable time and effort should be expended to ensure that the subject is deeply relaxed. It was suggested by Mrs Sinclair, one of the most reknowned gifted subjects, that a system of checks be worked out by the receiver, to ensure that a proper degree of relaxation is reached before proceeding to the next stage.
2) Engaging the conscious mind: this stage is designed to prevent the conscious mind from interfering with the unconscious psi-process. The stage is quite similar to the noise reduction theories of Honorton (1977, 1978) and Braud (1975, 1978a) presented in the last chapter. Both Honorton and Braud advocate the use of various altered states, including states of extreme

relaxation, to reduce incoming external noise. In White's model, the accomplishment of a deeply relaxed state is a prelimimary step, necessary to prepare the subject for the 'noise reduction' stage. In order to achieve a state of reduced conscious processing and activity, the waiting technique advocates focusing the conscious mind completely upon one mental image. This image can be either an object, such as a flower, or it can take the form of an image of blankness or emptiness. Whichever type of image is used by the receiver, it is important to reach a state where that image, alone, can be held effortlessly in the mind, without intrusion from other imagery, for a seemingly indefinite period. The subject would need to spend much time and patience to achieve a state whereby this degree of concentration upon one mental image can be attained.

2a) This stage is listed as a sub-stage because only two of the gifted subjects, Mrs Sinclair and Mrs Carlson, used this approach. These two receivers, having achieved the above stage, would then make a demand on their unconscious minds to let them 'see' the target in their conscious minds. The step can be seen as a release of tension, where the image the mind has been concentrating on is suddenly let go, and a demand for another image is made.

3) If step two has been mastered, a state of tension should exist in the percipient. This tension is the result of concentrating very intently on one image, while the conscious mind is probably

anxious to get on with the procedure and see the target. The object of this stage is simply to wait, letting the building tension mount within the subject. It is stressed that the stage can seem quite long to the subjects, but they are to wait, continuing to concentrate on their mental image, letting the tension mount, and resisting all urges to simply guess at the target.

4) The way the response enters consciousness: this stage can occur at any time once stage three has been attained. Sometimes an image will occur quite spontaneously, accompanied by a strong conviction that it is correct. But, if the image is not accompanied by a feeling of its correctness, various methods are employed by the percipients to determine whether or not it is the correct image. These methods are usually ones which a subject will develop only after much trial and error. Several people reported that only a fragment of the image would appear initially. In such cases Mrs Sinclair recommended that the person wait to see if the fragment develops into a more detailed image. A note should be made of the image, lest the subject forget it. The image should then be rejected, stage two returned to, and the process started over again. Through repetition of the process, the percipient should eventually achieve a state of ´knowingness´ about the correctness of some image which arises.

The above procedure is one which requires much dedication and hard work on the part of the subject. The subjects from whose experiences the technique was derived often stressed the need to adhere most carefully to the 'ritual' of the technique. White speculates that the degrees of interest and motivation necessary for a subject to endure this procedure may be a factor contributing to the apparent success of the technique. White also suggests that the experimenter should become proficient in the use of the technique before attempting to instruct others, as given the intensely subjective nature of the technique, it would be difficult and, perhaps, counter-productive for an experimenter to try to remain an outside observer in such a study.

Two attempts to replicate this method have been made. White, in an unpublished study (reported in Beloff, 1967), conducted a pilot experiment with four subjects, using the waiting technique. This study failed to produce any support for the success of the technique in eliciting significant psi scoring.

Beloff and Mandleberg (1967) ran two studies utilising the waiting technique. The first involved ten subjects. These participants attended a one hour training session every week for two academic terms, to be trained in relaxation and concentration. The actual testing involved ten sessions per subject, with four individual tests being given in each session. The subjects were limited to a twelve minute 'waiting period' (stage three), and, if they had not received an image in that time, they were instructed to guess. No significant psi scoring was revealed in any of the four tests, nor was there any improvement in scoring across the ten sessions. However, due to slightly suggestive scoring on one of the tests, a second experiment was run using only this one test.

The second study tested three subjects from the first experiment, and one of the experimenters (Mandleberg), also taking part as a subject. No time limit was imposed within which the subjects had to make their response. If no satisfactory image occurred during a session the subject could defer his attempt to the next session. In total, each subject was tested until he had made responses for ten targets. No significant psi scoring was obtained, nor was there any across-session changes in the subjects' scoring.

These experiments do not lend support to the efficacy of the waiting technique as a training technique. However, given the highly subjective nature of the procedure, and the degree of training and self-control required fully to replicate the technique, it is possible that the experiments do not represent true replications. No information is available as to the exact nature of the subject training procedure which was used by White in her pilot study. Beloff and Mandleberg specify having their subjects attend a one hour training session each week for a period of approximately twenty weeks. While this represents a great expenditure of time, both on the part of the subjects and the experimenters, it is possible that twenty hours, spread over a six month period, may not have provided sufficient training in the necessary relaxation and concentration skills.

White mentions the importance of practicing the imagery exercise (stage two) on a daily basis. Furthermore, the twelve minute time limitation imposed upon the 'waiting' stage in Beloff and Mandleberg's first experiment appears to be contrary to the instuctions for the technique. No such limitations were made in the second study, but no information is given as to how long participants were given to receive an image before a session was ended. Thus it is questionable whether these three replication attempts did replicate the advocated technique.

It seems foolish to dismiss a technique, based on methods which were apparently successful in the past, on the basis of these replication attempts (for more detailed information regarding the past experiments the reader is referred to Sinclair, 1930/1962; Warcollier, 1938 and 1963). Furthermore, this technique shares basic assumptions about psi-conducive states with ideas arising from recent research (ie, the noise-reduction theories). The technique offers the opportunity of bringing the reduction of such noise under the conscious control of the subjects, instead of having it imposed upon them by an altered state. This may be construed as either an advantage or a disadvantage.

If ideas put forth by Tart (1977, 1978), among others, regarding the fear of psi are correct, then this might be a disavantage. By having personal control over the receiving of psi imagery, the 'safety house' aspects of being in an altered state of consciousness (ie, 'it is alright to have ESP now, because I'm not who I normally or really am') are removed, and the subject must take ultimate responsibility for the occurrence of psi. However, if subjects were motivated and interested enough in using their ESP to train themselves thoroughly in the use of the technique, it is possible that they would: a) not be influenced by such fears; and/or b) their goal-oriented motivation to achieve success would over-ride any conscious or unconscious fears. More research is needed before final judgement may be passed on the efficacy of the waiting technique. But, whether or not it proves to be effective, it has drawn long overdue attention back to a potentially rich source of information; namely, the subjective state of the subject.

Morris (1977; also in Child _et al._, 1980) conducted a survey similar in concept to the waiting technique. Instead of examining work with gifted subjects, he surveyed over 70 ´popular´ books which claimed to develop psychic ability. This survey is referred to as the ´Airport Project´, as the data was derived from the type of books commonly found for sale in airport news stands. The data, collected by students from one of his introductory parapsychology classes, revealed certain consistencies in the type of advice given. This advice generally stresses the need to be confident, mature, and to have an acceptance of psi and of the consequences of acquiring psychic ability. The books then suggested routines to develop one´s ability, which entailed achieving a state of relaxation, then clearing one´s mind, and finally some directions regarding various imagery techniques. These instructions follow in general principle the routine advocated by the waiting technique. No mention in these books is made of any research to test the efficacy of these techniques in eliciting psi.

Some studies have been conducted to test the validity of the claims of groups of the type surveyed by Morris (1977). Brier, Schmeidler and Savits (1975) investigated graduates of the Silva Mind Control programme. This group offers a four day course, spread over two weekends, which is designed to develop psi capacities, among other things. The course, by means of relaxation training and auto-suggestion, claims to develop its students' ability to perform psychic diagnosis. Brier et al. examined these claims in three separate experiments. There was no evidence that any of the graduates of this course were able to give correct psychic diagnoses in any of the studies where double-blind conditions were utilised. Where double-blind conditions were not operating, the subjects' diagnostic abilities were better than would be expected by chance. The authors believed that this success was most likely due to sensory cueing, which the subjects received throughout the testing period regarding the correctness of their ongoing prognosis. Other research examining the claims of this group have also yielded non-significant results (Jacobson and Wiklund, 1976; Vaughan, 1974).

Groups such as the Silva Mind Control are very popular in the United States. While the advice offered by these groups is roughly similar to that of the waiting technique, the methods employed by the groups is not developed from the testimony of experimentally-tested subjects with proven records of success. Nor does any sound experimentation exist which supports their claims of successful ESP training. Thus it appears that these ´popular´ organisations, of the type surveyed in the Airport Project, have not yet provided constructive information which might relate to successful psi training.

### §3.3 The Immediate Feedback Training Method

Tart´s theory (primary sources: 1966, 1975a, 1975b, and 1977b) of immediate feedback to improve psi performance was developed from psychological learning theory. His method is based on the premise that psi is a latent ability, which subjects must learn to use in an experimental setting. Learning of any type:

> refers to a hypothetical change within an organism (whether animal or human) which is reflected or manifested as a change (improvement) in performance during the course of practice at some task. Almost all learning takes place in situations where the correct response is rewarded on each trial and incorrect responses are not rewarded, or may even be punished. (Tart, 1966, p. 47)

This theory was developed because, like White (1964), Tart felt that the most popular form of psi-testing at the time, card-guessing tests, was not psi-conducive. Tart believed that the fault lay not with the card-guessing test itself, but with the then-current experimental use of such tests. Specifically, since subjects in card-guessing tests did not receive trial by trial feedback as to the correctness of their response, it was impossible for them to learn to distinguish between correct and incorrect responses.

The type of learning which Tart is referring to differs fundamentally from that of the waiting technique. White's method depends upon the subject gaining a subjective understanding of what is or is not a correct ESP response. Tart's theory, on the other hand, does not believe this conscious understanding to be necessary. He proposes that psi ability, like many other abilities (eg, learning to ride a bicycle), is something which we can learn to use without being able to understand, explain, or even adequately conceive of. The feedback method was developed primarily for use with forced-choice, as opposed to free-response, methods. However, the feedback method has also been applied to many free-response studies, and so is included in this discussion.

Tart identifies several factors which can influence learning, over and above feedback. These include the subject's state of health, motivation to learn, and, most importantly, the time lapse between response and feedback. If a subject's health is adequate and there is a motivation to learn, the latter factor becomes all important. Most studies of learning demonstrate that learning is slower as the interval between response and feedback, or 'reward', increases. Tart estimates that an interval of a second or less is optimal for learning to occur, and that intervals of even a few seconds may result in a rapid decline of learning rate.

Extinction, the opposite of learning, refers to a correct response appearing less and less frequently, and finally ceasing to appear. The classical method for producing extinction of any response is to stop rewarding the response when it occurs, or to give rewards in such a way as to make them ineffective. This latter situation occurs when the response/reward interval is so long that no association between the reward and the response can be made by the subject.

The normal card-guessing test procedure is to give feedback after a fairly large number of responses have been made (25 is common); feedback is not usually provided after each response. Tart argues that providing feedback after a large number of trials is probably completely ineffective in providing the subject with any opportunity to learn to distinguish correct from incorrect responses. Tart believes that the manner in which feedback is given in ESP card-guessing tests in fact leads to extinction, rather than learning.

Research findings which demonstrate a decline in scoring across trials are quite prevalent, especially when testing ´gifted´ subjects (Palmer, 1978). This lends support to Tart´s belief that the common experimental methods of feedback in card-guessing tests lead to extinction of any ESP ability. To remedy this situation Tart suggests that: a) subjects be given virtually immediate feedback as to the correctness of their responses; b) the testing situation should be sufficiently motivating to the subjects for some ESP to be operating; and c) the mechanical equipment used in the experiment should be unobtrusive and not distracting to the subject or the agent (Redington and Tart, 1975, provide details of such equipment).

Tart's second suggestion contains an assumption crucially important to the success of the immediate-feedback training method. Specifically, some ESP must be operating when the subject is making at least some of his responses: if a subject is not using ESP when making his response, the use of ESP cannot be reinforced, and, therefore, learning to use it cannot occur.

A subject might be using his ESP to make some responses, but not others, which could be correct purely by chance. In such a case the feedback would be reinforcing some correct responses which, because they were not psi-mediated, could be seen to create some 'noise' in the system.

Tart predicts that this will lead to three possibile outcomes for studies using immediate feedback. Firstly, for subjects who use no ESP initially (ie, score at chance level), there is nothing to be reinforced, so they will continue to score at chance level, regardless of the length of the experiment. Secondly, for subjects who use only a little ESP initially, the resulting infrequency of reinforcement of ESP responses and the more common reinforcement of chance responses, may not allow learning to begin before extinction has started. In these cases there is greater reinforcement of 'noise' than of 'signal', so scoring can be expected to return to the chance level. Thirdly, subjects who use a large amount of ESP initially should receive more reinforcement for ESP-mediated responses than for chance responses. These subjects should display learning, by means of over-all increases in scoring as the experiment progresses. Tart states that future research will determine what level of psi-hitting ability will be required to draw the line between the second and the third predictions.

Tart also speculates that this theory should apply to the agent, as well as to the subject. Thus, if the agent were to be provided with immediate feedback regarding the success of his sending methods, he should be able to learn to send more effectively. As with the subject, the agent could only learn under such circumstances if the subject were making psi-mediated responses.

Many studies have been conducted to test the efficacy of Tart´s training model. As these are too numerous to be detailed here, the reader is referred to the feedback study reviews by Palmer (1978, 1982) and Mishlove (1983). The general findings of these reviews appear to have been that use of this method, with unselected subjects, has been associated neither with scoring inclines nor declines. Research with subjects selected for their apparent ESP scoring ability show that when changes do occur in the scoring pattern, they tend to be inclines. Given the previously reported tendency for psi scoring to decline, Palmer concludes ´feedback does indeed have a tendency to stabilize ESP scoring and perhaps to enhance it in some cases´ (1978, p. 187).

But do the scoring tendencies noted above reflect an improvement in ESP ability? Palmer (1978) raises the possibility that the stabilising tendencies of immediate feedback may reflect nothing more than heightened motivation, due to scoring continuing to be above chance. He further speculates that more definite scoring increases may be obtained if the subjects were to be given more training in detecting internal cues. Mishlove (1983) also sees the lack of training, related to internal cue detection, as a possible problem with Tart´s model.

In Tart´s initial presentation of the feedback method, no details were provided regarding **how** a subject would learn. The overall impression from his early writings on this method was that the learning process would be a largely unconscious one. This position is somewhat reversed in Tart´s later writings. He specifically addresses the criticisms raised above in a paper published ten years after his earliest feedback publications (Tart, 1977b). In considering the possible effects of motivation he notes that when the scoring of a subject declines, it will very rarely improve again, regardless of various incentives which may be offered. This is to be expected in learning theory, as the ability will have become extinct. It also seems to support Tart´s concept that lack of feedback can lead to extinction of ESP scoring ability. If this be the case, it can argued that, as learning theory predicts that stabilisation or inclines in scoring will occur, it is unlikely that such findings in immediate feedback experiments are due purely to heightened motivation.

Whether or not such inductive logic proves valid, Tart emphasises the need for subjects to be motivated for success in the task. He specifies that the task of learning from immediate feedback is a demanding one for the subject, and strong motivation will be needed to persevere with the training. The difficulty the subject will experience comes from his trying to identify the internal cues which accompany a psi-mediated response, and differentiate them from those attending non-psi-mediated responses. To be successful in this task Tart identifies ten factors which the subject should possess:

> (a) high (but not excessively high) motivation, (b) high general learning ability, (c) absence of specific conscious or (inferred) unconscious resistances to psi, (d) good ability to discriminate contents of the experiential field, (e) good ability to separate experience-as-perceived from experience-as-interpreted, (f) good memory skills, (g) ability to quiet one´s mind, (h) non-attachment, ability to drop strategies that are not adaptive in spite of emotional investment in them, (i) low levels of maladaptive strategy boundness in the specific sense of not mechanically avoiding guessing what has just come up as the previous target, and (j) ability to ignore sensory distractions. (1977b, p. 405)

Thus Tart´s theoretical approach now appears to be directed towards the subject gaining a conscious recognition of the internal cues which accompany a psi-mediated response: ie, ´deliberate, conscious control of psi´ (1977b, p. 403).

Tart believes that his theory is compatible for use with various psi-conducive procedures, including those such as the ganzfeld and hypnosis. He also states that it might be beneficial to combine the use of immediate feedback with the waiting technique. Regarding this suggestion, this author believes that any form of immediate feedback would be disruptive to the concentration which is vital to the success of the waiting technique.

Some studies have been conducted using immediate feedback with other apparently psi-conducive states. The immediate feedback reviews previously recommended will provide information about these. For the purposes of the present review the major studies which were aimed directly at **improving** ESP ability will be briefly presented. Many of these studies incorporate features found in the waiting technique.

## §3.4 Training Studies which use a Combination of Approaches

Of particular relevance to this thesis is a study by Braud and Wood (1977), which examined the role of immediate feedback in the ganzfeld. In that study the effects of receiving immediate feedback were compared to results from a control group, in the ganzfeld but with no feedback. Fifteen subjects each were assigned to feedback, and no feedback, conditions. Each subject participated in six sessions, consisting of one pre-test, four training, and one post-test session. In all sessions the mentations of the subjects were relayed to the agent, via an intercom, during the 35 minute ganzfeld stimulus period. The pre- and post-test sessions were identical to each other, and to each condition. In these sessions, the agent was not aware of the target until the last five minutes of the stimulus period, when the sending then occurred. The onset of the five minute sending period was signalled to the subject by a bell sounding, which was recorded on his pink noise tape.

During the four training sessions, two targets were viewed by the agent, both for fifteen minutes, during the first thirty minutes of the stimulus period. As in the other sessions, there was a final five minute sending period, of a third picture. Only this final sending period was considered in the overall scoring. The feedback group received immediate feedback via a tone of slightly greater intensity, but of similar composition to the pink noise, immediately upon making a mentation which the agent judged to correspond with the target. This feedback was provided during the two fifteen minute sending periods, but **not** the final five minute period. The subjects in the no-feedback condition experienced identical ´training´ sessions, except that they were given no feedback during the course of their mentations. All subjects learned the identity of all three target pictures during the judging period at the end of each session, so that delayed feedback was received by all.

Three measures were taken of overall scoring. One was based on a rank-ordering of the target pictures. The other two were based on coding for the BTP; one derived from the coding for the mentations for the entire stimulus period, and the other on the coding for the five minute sending period (referred to as the ´exposure period´). In the pre-test sessions neither the feedback nor control group demonstrated extra-chance scoring by the two coding analyses. However, in the analysis based on target ranks, the control group yielded significant psi-missing ($p < 0.008$, two-tailed), while the feedback group scored at chance; the difference between them was significant ($p < 0.05$, two-tailed). For the post-test session the feedback group showed significant above-chance scoring, using the exposure period coding analysis, while the other analyses were non-significant. The pre- to post-test change in scoring rate was significant ($p < 0.02$, two-tailed). For the control group, all of the post-test analyses were non-significant. However, there was a significant change between the pre- and post-test scoring as measured by target rankings ($p < 0.05$, two-tailed). All three analyses revealed inclines in scoring between the pre- and post-test sessions for the feedback group, though only one of these increases was significant.

For the control groups, excepting the significant improvement shown by target rankings (from psi-missing to chance scoring), the two coding analyses both demonstrated a slight decline in scoring. The authors discussed possible interpretations of these results, favouring the hypothesis that the improvement in the feedback group reflected a learning effect attributable to immediate feedback.

It is hoped the reader will forgive such a detailed description of a relatively complex study. But if the results of this study are accepted, it presents a strong case in favour of using the ganzfeld in conjunction with immediate feedback as an ESP development technique. However, it is the author's opinion that these results are inflated, due to mutiple analysis, for which no corrections were made in the reported analyses.[1] The findings in the feedback

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1. Both Honorton and Hyman re-analysed the outcome of this study for their respective meta-analyses. As the study did not report direct hits, Honorton did not include it in his direct hit meta-analysis. He did judge it to be significant using the Bonferroni alpha correction method, which in the case of this study required correcting for 26 analyses. In making this correction he

group are only marginally significant ($p < 0.05$, two-tailed). If corrected for multiple analysis they would cease to differ significantly from chance. The interpretation of these findings is also confused by the psi-missing of the control subjects in the pre-test session. The ´incline´ which occurred in their scoring between the pre- and post-sessions, was considerably greater than that of the feedback group; as demonstrated by graphs presented in the original paper. Thus, it could be argued that the no-feedback, control group also showed an incline in scoring, comparable to the feedback group. Due to these considerations, this author does not think that the Braud and Wood study has provided convincing evidence for the efficacy of increasing scoring by providing feedback in the ganzfeld.

Tart´s (1977b) consideration of factors related to successful learning with immediate feedback contains concepts which this author feels do not operate effectively in the ganzfeld. Specifically, Tart stresses the importance of good memory skills, good ability to

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combined the coding scores of the exposure period for both the pre- and post-sessions, as he was interested in overall effect, not scoring differences between sessions or conditions. This author does not believe he was justified in using the coding for the exposure period instead of the coding for the overall session, which is the measure generally used when evaluating overall effect. The correctness of this may be argued, as Hyman (1982) and Honorton (1982b) have done, since the authors specified that they believed that most target-related information would be revealed in the exposure period. Hyman did not classify the study as having a significant outcome when computing his meta-analysis, which was based on the overall session coding.

discriminate contents of the experiential field, and good ability to separate experience-as-perceived from experience-as-interpreted. The altered state produced by the ganzfeld varies from individual to individual, but it is generally similar to the pre-sleep hypnogogic state, which may be characterised as ´experientially a pre-sleep stage of drowsiness with hallucinatory images´ (Parker, 1975b, p. 105). Memory impairment is common whilst in the ganzfeld, which is why a review of mentation prior to judging is such an important part of the judging procedure.

Vogel, Foulkes and Trosman (1972) have classified the hypnogogic state according to the ego´s degree of control over the direction of thought and reality contact. Two of the stages mentioned represent states which appear to be contrary to the factors mentioned above: namely, a ´destructuralised ego state´, in which thought is characterised by bizarre, irrational and acausal imagery, and reality contact becomes impaired; and, ´restructuralised ego state, where thought content is more realistic but contact with reality has been lost´. To carry out an examination of internal cues in the manner suggested by Tart would require a firm reality contact, and quite rational thought processes. Thus it would appear that Tart´s factors require an ability, to examine internal cues, which would be lacking in the state induced by the ganzfeld.

Regarding the efficacy of other psi-conducive and training techniques when combined with immediate feedback, Tart suggests:

> that a combination of hypnosis for quieting the noise of ordinary consciousness and producing increased attention to the experiential field, combined with White´s "waiting technique," would be particularly fruitful additions to immediate feedback training. (1977b, p. 403).

A training technique utilising this combination was produced by Ryzl (1962, 1966). His procedure was developed before either White or Tart had published their training methods. Thus it does not represent the exact formula advocated by either White or Tart. However, many of the features of both White´s and Tart´s models are incorporated in it.

Ryzl´s training method involves five general stages, described below.

1) Psychological preparation of the subject prior to hypnosis. This stage consists of:

   a) familiarising the subject with the hypnotic procedure;

   b) developing the subject´s trust in the experimenter; and

   c) convincing the subject that ESP does exist, and that if he follows the training method exactly, he will acquire ESP ability.

2) Induction of the hypnotic state: this stage is designed to enhance the subject´s suggestibility as much as possible. The subject will be hypnotized many times, during which his suggestibility will be increased. Of primary importance to this stage is the necessity to train the subject to have very clear and distinct mental imagery. The subject should not proceed to the next stage until he has developed the ability to

experience very clear mental imagery of any 'picture' which the experimenter might suggest. It is necessary for the subject to be able to hold this imagery in his mind for as long as the hypnotist wishes.

3) Utilisation of the hypnotic state in the induction of ESP: this stage develops the subject's ability to gain ESP impressions while hypnotized. Initially the subject, while hypnotised with his eyes closed, is asked to visualise objects which are placed on a tray in front of him. He is given various instructions to make this easier, such as mentally looking at the object from various angles, or trying mentally to touch it. Sessions of this type are continued until the subject is able to visualise, by means of ESP, the objects placed in front of him. The most difficult task of this stage is to teach the subject to distinguish ESP imagery from other imagery. This is achieved by providing the subject with immediate feedback as to the correctness of his response. By this means the subject will learn, by experience, to identify subjective criteria with which to make the distinction.

4) Steps in the development of the subject's growing abilities: once stage three has been achieved, the subject is presented with increasingly complex and difficult tasks. The targets will be moved further away. Controls will be gradually added which will mitigate against any possibility of sensory cueing. The nature of the task may vary from simple visualisation of the target, to precognitive and/or retrocognive clairvoyance

tasks, and telepathic thought perception. Ryzl notes that initially the subject´s perceptions will be inaccurate in some respects. He lists eleven possible sources which may give rise to these errors. The subject is trained to recognise the errors when they occur, and to overcome them. This, and the previous stage, will require much hard work on the part of both the subject and the experimenter. But if each persists, the subject eventually should perfect his ability.

5) Conscious mastery of the ESP faculty: during all the previous stages, the subject was in a hypnotic state and completely under the experimenter´s control. In this stage the subject´s dependency upon the experimenter is gradually reduced. The subject is taught to induce states of self-hypnosis, and, thereby, to be able to use his ability independently of the experimenter.

Ryzl´s training method would require a great deal of time and effort on the part of both the subject and experimenter (ie, the hypnotist); he states that the training may take years to complete. Ryzl reported success with about ten percent of the approximately 500 subjects trained using this method. As the training was conducted while he was living in Czechoslovakia, the majority of his subjects have not been available for testing by other paraphyscologists. Nor has Ryzl trained any further subjects using his method, since his defection to the United States over fifteen years ago.

One subject whom Ryzl trained, Pavel Stepanek, demonstrated reliable ESP, under experimental conditions, for over ten years before his ability declined. Pratt (1973) provides a review of the 27 different studies conducted with Stepanek by western researchers, many of whom visited Prague to work with him. Yet, as no research was carried out with Stepanek by other researchers **before** his having been trained, it is difficult to assess whether or not Ryzl´s training was responsible for his apparent ability. However, at one point when Stepanek´s performance seemed to decline, Ryzl put him through some retraining and his high-scoring ability returned.

Attempts at replicating Ryzl´s work have been unsuccessful (Stephenson, 1965; Beloff & Mandleberg, 1966; Haddox, 1966; Fourie, 1976). Honorton and Krippner (1969) reviewed three of these replication attempts, and noted various ways in which they failed to take into account all of the potentially important aspects of Ryzl´s method. All of the studies worked with a much smaller number of subjects than the 500 trained by Ryzl. Beloff and Mandleberg (1966) worked with twenty subjects, while all the other replication attempts tried to train fewer than ten. As Ryzl reported that only ten percent of his subjects responded to training, this alone could account for the failure of the replication studies.

Ryzl put great importance on the relationship between the hypnotist (he acted as such in his studies) and the subject. Fourie (1977) attempted to replicate this specific aspect of the training, which he thought the other studies had failed to do. However, this special subject/experimenter relationship may be an ´unreplicatable´

phenomena, by anyone other than the orginal author and subjects. Furthermore, Ryzl never reported how long training should continue, when faced with an initial apparent lack of success. Many specific details such as this are missing from Ryzl's reports, and such ommissions make replication attempts difficult, if not impossible.

The concept of imagery conveying the psi information is central to the Ryzl method, as it is to the waiting technique. While this appears normally to be the case, experimentation examining possible relationships between psi and imagery have received inconsistent results (see George, 1981; and George and Krippner, 1984, for reviews of this literature). George (1981) states that the inconsistency may be due to the questionable validity of the measurements of imagery normally used. Furthermore, most research has concentrated on examining the role of the vividness of imagery. George notes that training to develop vivid imagery is usually intensive, and may take years, as opposed to the much shorter periods alloted such training in experimentation.

Several studies have been conducted examining imagery training with a view to developing psi abilities. George (1982) conducted an experiment which utilised a relatively intensive imagery training programme. In his study twelve subjects took part in one session a week for a six week period. During each session, the subjects would first take part in a progressive relaxation exercise, then receive twenty minutes of imagery training, and finally would take part in a psi test. They were also given several 'homework' imagery exercises, to be completed before the next session. The overall results showed no significant psi scoring, nor was there any significant fluctuation in psi scoring across sessions. However, there were some indications that imagery functioning improved over the sessions. It was also discovered that subjects who spent more time practicing their imagery training homework displayed better psi scoring on a free-response task. However, as the scoring of these individuals did not improve across sessions, George hypothesised that the scoring differences were more likely to be related to motivational than imagery-related effects.

Other imagery training work has been carried out by Morris and his collegues. The first in their series, conducted by Mockenhaupt, Robblee, Neville and Morris (1977), was a pilot study, with a single subject. This subject took part in approximately two sessions a week for a total of sixteen sessions. Each session consisted of five separate trials. The subject would go through a process similar to that of the waiting technique. He would first relax by means of a relaxation exercise. He then would clear his thoughts, whilst mentally reaching out to the agent. When he felt ready, he would signal for the trial to begin. The agent would then view a slide for a four minute period, during which time the subject would make a verbal mentation report of all his ongoing imagery.

At the end of the four minute mentation period the subject would judge two slides, one of which was the target. Immediately upon reaching a decision, the subject would receive feedback as to the correctness of his response. He would then proceed to the next trial in the session, in the same manner. At the end of each session the subject, agent, and experimenter would discuss various factors, often of an introspective nature, which may have influenced the outcome of the trials. The overall results of this study revealed no significant psi scoring, and no mention was made of scoring patterns across trials.

Morris, Robblee, Neville, and Bailey (1978) reported two further projects investigating the role of imagery and psi. In the first, one subject took part in twenty sessions of the same basic design as that of the previous study, with the exception that each session consisted of only four trials. This study combined the use of feedback with a subjective introspection period. The agent was instructed not only to concentrate on the target, but also to draw it, and to use body gestures or any other appropriate means of expressing its contents. The agent was able to hear the subject's mentations as they were being made, via an intercom. The study stated that at the end of each trial, the subject would check his imagery with the target to 'assess which of his impressions if any were accurate, and what feelings were associated with those impressions' (Morris _et al_., p. 144). The results from this eighty-trial study were not significant, with no across trial improvement in scoring.

The second project screened for subjects who showed promise, in terms of imagery and psi ability, and who had a positive attitude towards the project. The screening consisted of two sessions, each of the type described in the first project. From this screening six subjects were selected to complete four testing sessions, of the same design as the pre-test screening sessions. The results from the study showed significant overall psi-hitting ($p < 0.02$ two-tailed). However, contrary to expectations, the scoring was higher for the first two sessions than for the second two, with the difference in scoring rate between the two session groups being significant ($p < 0.05$ two-tailed). Thus, the study offered no evidence that any ´learning´ had occurred, although it did indicate that the general procedure is psi-conducive.

An experiment designed to test the effectiveness of various mental development techniques was conducted by Morris and Bailey (1979). This study utilised one preliminary and four testing sessions, of two trials each, with each of eighteen subjects. The preliminary session consisted of a ten minute progressive relaxation exercise, followed by a four minute mentation period, which corresponded with the projection of the target slide in a different room. There was no agent in the study.

After the four minute imagery-generating period, the subject was requested to draw each image, as the experimenter re-read his mentations to him. The subject was then shown two pictures, one of which was the target, for a five second period, and was requested to draw roughly each of these pictures. The subject would then be allowed to view each picture for as long as needed, and would rate each picture according to its correspondence to his imagery. He then received feedback as to the correct identity of the target.

After a short rest period a second trial, identical in design to the first, would take place. Each subject participated in four test sessions, using the same procedure as the preliminary session. After the first test session, all subjects were asked to practice progressive relaxation and mind-clearing exercises, once a day, at home. After the second test session, half the subjects were given a simple concentration enhancement technique to practice at home every day, while the other half were given a simple visualisation enhancement technique to practice. No overall evidence of significant ESP scoring was obtained. Hypotheses of improvement across sessions in ESP scoring, and of improvement in the abundancy of imagery, were not supported. Cross-session scoring displayed a slight decline, although the imagery abundance did improve slightly. Those who received visualisation exercises showed a greater increase in imagery abundance than did those receiving concentration exercises, but not significantly so.

Morris (1980) has reported another study comparing the effects of visualisation and concentration exercises on psi performance. Initial sessions, similar to previous procedures, involved eight minutes of progressive muscular relaxation, followed by three minutes of mental relaxation. There followed a four minute imagery period, after which the subject would sketch his impressions and then judge two slides, one of which was the target, for correspondences to his mentations. At the completion of the judging procedure, feedback would be given as to the identity of the target. There were two trials per session.

The study included two preliminary screening sessions. Subjects were chosen to participate in the formal study on the basis of their overall apparent maturity, their approach to having psychic ability, their success in generating apparently psi-related imagery, and their ability to generate and report imagery. Eleven selected subjects then participated in a further three pre-training sessions, similar to the screening sessions.

Before participating in the three pre-training sessions, each subject received instructions on how to put himself through the progressive relaxation procedure which he would undergo at the beginning of each session. The subjects were given a week in which to develop their skill at using this exercise. Half the subjects were then given further training in visualisation enhancement techniques, while the other half were given training in concentration enhancement techniques. This training, developed from the Airport Survey (Morris, 1977), was given to the subjects over a ten week period. After completion of the training programmes, each subject participated in three test sessions.

The overall results, including the screening, pre-, and post-training sessions, showed significant psi scoring ($p < 0.05$, two-tailed). The rate of psi-hitting declined across sessions, but there was no significant difference between the pre- and post-training sessions. A very significant difference was found when examining the performance of the visualisation, versus the concentration, training groups. The visualisation group all either improved or maintained their level of psi-hitting, from the pre- to post-training sessions. The psi-hitting of all those receiving concentration training declined from pre- to post-session, and this decline was highly significant ($p < 0.005$, two-tailed). Morris believes that this difference does not necessarily argue for the superiority of visualisation over concentration training in enhancing psi ability. Rather, he states:

> the concentration exercises may have been harder to do, requiring more discipline with less immediate experiential reward, so that participants had more feelings of failure with the exercises, less motivation to do them on schedule, and consequently, less expectation of improvement during the post-training sessions. (1980, p. 3)

From this Morris concludes that while visualisation training shows promise, and deserves more attention, it may be the lack of concentration skills which is the ´crucial aspect of the failure of parapsychology to devise procedures by which to accomplish its goals.´

This perspective would support the views put forth by White from her study of the waiting technique, and may account for the failure of the two replication studies of that technique. While visualisation was an important part of the waiting technique, the ability to concentrate exclusively upon the mental image, to the exclusion of all other images, was the crucial factor to the technique´s apparent success.

The feedback method would also require a high degree of concentration, to learn how to distinguish between psi-mediated and other internal cues. However, as none of the Morris training study series employed immediate feedback, the studies do not offer information directly relevant to Tart´s training method.

## §3.5 The Training Approach Used in this Thesis

The attempts at ESP training discussed thus far have all focused on learning to identify internal cues which signal a ESP-mediated response. This approach is relevant to one of the training experiments contained in this thesis, and will be further discussed when that experiment is presented, in Chapter Five. However, the primary goal of the two training experiments undertaken for this thesis was to train subjects to better recognize possible response errors which commonly occur in free-response ESP mentations.

The errors which are being referred to are those which result in a misinterpretation of these responses. Previous research has demonstrated that certain ´transformations´ commonly occur when an apparently ESP-originated response is made. That is to say, the response, be it verbal, and/or drawn, will rarely be an exact replication of the target. The degree of transformation between target and response can vary from slight differences, to large variations which may completely mask the true identity of the target. Thus the ESP content of some responses may be unrecognisable as such.

In the two training studies conducted for this thesis, attempts were made to train subjects to better recognise such errors. It was felt that if these errors could be recognised, the subjects would then be better able to ´see through´ the error content, or transformations, of their responses. If this were accomplished scoring rate could increase, due to the extraction of a greater amount of target-related information from ESP responses. Thus the primary goal of the experiments was to obtain a greater amount of target-related information than was normally retrieved from ESP responses.

As mentioned in the first chapter of this thesis, it is not possible to clearly differentiate between psi-originated and non-psi-originated responses. For the purposes of the studies conducted for this thesis, responses which **may** have contained transformation errors were loosely defined as any response which appeared to have some connection with a possible target pictures. This broad definition was adopted to help subjects develop a sensitivity to the many different forms in which possibly psi-originated responses may appear, due to transformation of the initial target information.

The manner in which the studies tried to achieve this end will be discussed in the presentation of each experiment. The only other sources, of which the author is aware, that address overcoming these errors are: those previously mentioned when discussing the waiting technique, where subjects would simply wait until a feeling of ´correctness´ occurred about one of the images; a very general consideration given to the topic by Ryzl; and a ganzfeld study by Sondow (1979). Ryzl proposed correcting errors by providing the subjects with immediate feedback about the incorrect image, and then gradually leading them to the correct image by asking them to concentrate on visualising those aspects of the target which are being incorrectly reported. The Sondow study was not primarily concerned with training (see discussion in the introduction to Chapter 5).

The approaches taken both in the waiting technique and by Ryzl are concerned with identifying correct as distinct from incorrect responses, as the impression enters consciousness. The author´s approach differs from this, as there was no attempt to train subjects to differentiate correct from incorrect responses as the impression was consciously recognised. Rather, the aim of Experiments II and III was to train subjects to recognise potential ESP information, which might otherwise go unrecognised.

## §3.6 A Description of Transformation Errors

As mentioned in the introduction to this chapter, Warcollier (1938, 1948/1963) has compiled an extensive list of the type of errors under consideration here. Warcollier believes that these errors arise either from the subject´s subconscious interacting with the target information, or from the agent. Warcollier (1938) identified three general classifications of the transformations which may occur to target-information during ´transmission´. (Warcollier adopted a transmission model of psi-functioning: eg, psi information is somehow ´transmitted´ from one source to another. The term ´transmission´ is used for convenience, and is not meant to infer that psi-functioning does involve a transmission of any sort.) These three classifications contain many variations, the most common of which are noted. The classifications are:

**1) When the form of the target is contained in the response, but**

**not its idea or meaning.**

An example of this can be found in Mrs Sinclair's (Sinclair, 1939/1962) work when (p. 85), in response to a target drawing of a fishing hook, she drew a stem in the shape of a hook, with a small flower on the end, which was not dissimilar from the barb of the fish-hook. Thus, the response of a flower to a target of a fish-hook bore tremendous similarity in form, but did not contain any information as to the idea or meaning of a fish-hook.

This category may also include situations where a target appears to have been broken down into its components and rearranged. Thus, a square may become unconnected right angles (Warcollier, 1948/1963, p. 32). It may also occur that the target is conveyed in its basic form, but various parts have been left out, or changed in such a way that it is not recognised as the target by the subject (Warcollier, 1948/1963, p. 36).

Certain elements of the target also may duplicate themselves, and may then reorganise themselves into a new meaningful whole, which bears little resemblance to the orginal target (Warcollier, 1948/1963, pp. 40-43). Of the various errors identified by Ryzl, the only one which is of the type considered in the studies reported here falls in this category. He described it as: 'Mistakes in interpretation: The subject may see a scene correctly but misinterpret its meaning' (1966, p. 507). The same error type is noted by Targ and Puthoff (1977, p. 160), when they express interest in 'the general analytic confusion about the meaning of the pictures, in contrast to the correctly perceived patterns'. While this error type is more commonly noticed than the others, the author does not believe that this represents a greater occurrence of it. Rather, this type of error is the most easily discernable, in drawing experiments. Thus it is more likely to be noticed, which is probably why it is commented upon most frequently.

**2) On some occasions both form and meaning may be transmitted, but incompletely.**

Thus Mrs Sinclair (p. 88) once drew a twig of holly in response to a target of a reindeer. The holly twig resembled the horns of the reindeer in form. As Mrs Sinclair associated both holly and reindeer with Christmas, her response contained something of the meaning of the target also. In this example the meaning was conveyed by means of a personal association of Mrs Sinclair´s.

Another example of this classification given by Warcollier (1938, p. 41) contained a general association. Here the target was a post card showing a pond, an island, and distant trees, with swans in the foreground. The subject drew the trees and pond perfectly. However, the shape of the island was indistinct, and he had an idea of animals, which he took for dogs. He then added a boat to the pond. Thus the swans were interpreted by means of a general association with animals and floating objects.

The response may contain only a small detail of the target but be quite accurately represented, although it might be enlarged upon or placed in a different context. Warcollier (1939/1963, p. 56) cites an example of this: the target was a complex picture, for a travel agency, of ancient Egyptians travelling down the Nile in a boat. One subject received imagery centred around a snake, which was pictured as a detail in the picture. This subject also received correct colour, but no other target-related imagery. Another subject, given the same target, responded that he saw imagery of a gondola (similar in shape to the boat in the target picture), and of a pagoda. This subject's response contained not only a fairly accurate 'form and meaning' representation of the boat, but also possessed information regarding travel and the foreign nature of the target (although these features were incorrectly identified).

**3) This classification refers to responses where the idea or meaning of the target is present, but the form is lacking.**

Examples of this from Mrs Sinclair's work (pp. 70-71) include a target of a running fox, and a response of a hunting horn and two crossed guns; and a target of a car, with a response of a hub, with spokes radiating from the centre, which is labeled 'it revolves', and then a drawing of a conical shape labeled 'horn'.

Thalbourne (1981, p. 7) provides another example of this type, where the target was a bat (the animal) and the response was a drawing of a squash-racquet, labelled 'a bat'. In this example the literal meaning of the word representing the target drawing was perceived, but it bore no relationship to the actual meaning of the target. If the target contains, implicit or implied, a sense of movement, the response may bear no resemblence to the target in form, but may convey a similar sense of movement (examples are contained in Warcollier, 1939/1963, pp. 47-54).

The three general classifications given above contain a large variety of the different types of transformation errors which may occur. The categories are given as general guidelines, and may overlap to varying degrees. Often only a part of a target may be perceived. This part is again liable to all the various transformations described in the above classifications.

Many different examples of transformations are contained in the work of various drawing experiments. Warcollier (1938, 1948/1963), aside from providing many examples of different transformations, also identified ways in which 'paranormal mental imagery reveals characteristics like those found in normal forms of experience', and noted how 'the laws of normal and abnormal perception seem to apply to telepathy' (1948/1963, p. 27; see also Hastings, 1976). Other particularly rich sources of illustrative examples of these transformations can be found in Sinclair's (1939/1962) Mental Radio, and Ullman, Krippner, and Vaughan's (1973) Dream Telepathy.

The specific form that transformations may take may be influenced by numerous factors. Some of these factors include personal memory, personal associations, general associations, and emotional factors. These influences will be discussed in greater detail in Chapter Five.

## §3.7 The Training of ESP: Ethical Considerations

As has been pointed out in the first section of this chapter, no reliable method for the training of ESP has yet been discovered. Even work with gifted subjects obtains results which are riddled with errors, and many trials are required to obtain relatively small statistically-significant levels of ESP scoring. Given this state of affairs, concerns regarding the ethical problems entailed in developing ESP ability do not appear to be of immediate importance. It is not surprising, therefore, that very little has been written about the possible consequences of successfully learning how to develop psychic abilities. However, such a lack, with reference to ethical considerations, seems inappropriate.

When a training study is embarked upon the experimenter must have some foundation for believing that the work will, at the very least, reveal some aspect relevant to the questions involved in developing psi abilities. And there of course is the ever-present possibility that, at any time, a means will be discovered which enables people to learn to reliably and consistently use their ESP much as we use our other senses. What are the implications of this possibility?

In considering these implications, the first problem centres on the unknown limitations of ESP ability. We do not have any true knowledge of what these abilities may in fact entail. It is possible that the ability is not capable of being truly developed in the same way as are other abilities. If this is the case, then ESP will remain an elusive, unknown quantity which is ´coaxed´ into making an occasional appearance in laboratory settings, and, occasionally, spontaneous appearances. However, the other extreme is equally possible: that ESP abilities can be developed to a level that at present seems confined to the realm of science fiction.

Given the unknown nature of psi, it is not possible concretely to delineate the possible ramifications of ESP training work, nor the ethical questions which may arise. Nonetheless, ESP development remains an area of active research among parapsychologists. Furthermore, the popularity of various organisations which claim to develop psychic ability, among other human potentials, demonstrates that the general public is interested in acquiring psychic skills. Thus, at the very least some speculation upon the possible effects of psi training would seem to be prudent.

The potential uses and influence of ESP are enormous. ESP may have major effects upon people on both an individual, and a societal level. Like so many human facilities, its influences may have the potential for being manipulated both in ways which could be conceived of as being beneficial or 'good', and/or detrimental, or even 'evil'. A detailed review of these factors is beyond the scope of this thesis. A broad perspective of possible ESP influences, and relevant ethical considerations, is presented in Elgin's (1976) excellent paper 'The Ethical Use of Psychic Energy'. For the purposes of this chapter the discussion of ethical considerations will be limited to those factors which the author believes to be relevant to her work.

The goal of the experimentation undertaken for this thesis was to enable subjects to recognise ESP information contained in their responses which they might not otherwise have recognised. There was no attempt to increase the amount of ESP which they obtained. Thus there was no attempt to develop the subjects' ability to obtain ESP responses, nor to enable them to differentiate ESP impressions from others as such impressions enter consciousness, as do most other training approaches. This research was aimed simply at making subjects more aware of the possible ESP content of their experimentally-produced responses. These aims were described fully to all potential subjects before they were allowed to take participate in a study. The subjects were people who were either interested in experiencing ESP, and getting to know more about it, and/or those who believed they had experienced ESP in other situations, and were eager to learn more about their experiences.

All three experiments were undertaken employing the ganzfeld technique. When speaking with subjects about the experimental goals it would be pointed out that it was the ganzfeld stimulus that was conducive to the occurrence of psi imagery. It was stressed that as they were unlikely to find themselves in a ganzfeld environment (eg, with halved ping pong balls taped over their eyes, etc.) outside of an experimental session, it was unlikely that they would experience an increased amount or awareness of ESP in their day-to-day lives.

The primary reasons for giving this information to subjects were to allay any fears which they might have regarding ESP, especially fears concerned with developing an ESP ability which they could not control, or which might provide them with information that they did not want. Thus the ganzfeld was presented as a ´safe-house´ where they could feel free to have psi experiences, without fear of these experiences intruding into their normal, everyday lives.

This approach to ESP training eliminates most of the difficult ethical questions which arise from developing a subject's ability to have or be aware of ESP. As there was no training to teach the subjects to develop their ESP ability per se, the author did not have to be concerned with the way in which newly-aquired ESP skills might affect their lives. The author feels that this approach is justified, in that there is no evidence that the ganzfeld does develop ESP ability, or that ganzfeld experience results in a greater awareness of ESP outside of the experimental setting.

Several of the subjects reported never having had any prior ESP experiences. Therefore the possible impact of having such an experience was an ethical concern of these studies. A main factor in evaluating the potential impact of an ESP experience was the subject's attitude towards having such an experience. All of the subjects were very interested in experiencing ESP. Those who had not had prior experiences were participating in the experiments mainly because they wished to have such an experience.

Most of the subjects were either personal friends of the author, or referred to her by friends. Whilst no specific measures were taken to ensure that they were possessed of stable, well-balanced personalities, the apparent mental state of potential participants was taken into consideration when deciding whom to have as subjects. People who appeared to be somewhat mentally unstable, or who gave the impression of being inordinately concerned about possible psi influences, were not chosen. Given this general precaution, there is no evidence that a subject has ever had an experience in the ganzfeld which had either a negative or profound impact on his life. With this in mind, and in view of the participants´ eagerness to have ESP experiences, it was not considered likely that the subjects might have an ESP experience in the experiments which could be in any way detrimental to their well-being.

Nor did the author have ethical worries about her experimental procedure. Even at the time the first study was conducted, the ganzfeld technique had been used in well over a thousand experimental sessions. The ganzfeld is widely perceived as being a pleasant and enjoyable experience. Furthermore, the process of verbalising one´s ´stream-of-consciousness´, as is done in the ganzfeld, is thought to be an interesting and engaging task. The author is unaware of anyone having ever reported having had a particularly unpleasant experience whilst in the ganzfeld. Such an occurrence certainly has never been reported in any published study.

The subjects were all instructed that they could stop the ganzfeld stimulation at any time, for whatever reason they wished. (This occurred only twice in the 142 sessions conducted: once due to a subject not feeling well; and once due to the subject feeling that she was too preoccupied with other concerns to properly relax and ´get into´ the ganzfeld experience.) Thus it appears that the ganzfeld is a procedure which holds little possibility of the subject having an experience which could be construed as unpleasant or negative. From an ethical standpoint, the author believes that the ganzfeld is a procedure which, for both the subjects and experimenters, has been accurately described by Sargent (1980a, p. 103) when he stated: 'I know that Ganzfeld psi testing is great fun and extremely rewarding...'.

# CHAPTER FOUR

## EXPERIMENT I: A THREE PERSON STUDY OF PSI IN THE GANZFELD [1]

### §4.1 INTRODUCTION

This experiment was conceived as a pilot study to introduce the author to the ganzfeld technique. A primary goal was to evaluate, on a first-hand basis, the efficacy of the technique in eliciting positive psi scoring. Also, as the future experiments for the thesis were to be concerned with the development of psi ability utilising the ganzfeld, it was deemed necessary to have personal experience of all the different experimental aspects of the technique. Specifically, knowledge of the ganzfeld from the perspective of the experimenter, the subject, and the agent was required. The use of a multiple-session design was also necessary, for two reasons. First, the author wished to gain as much experience as possible with the ganzfeld. Secondly, as future experiments were planned which would incorporate a multiple-session design, assessment was required as to whether or not repeated experience of the ganzfeld would result in boredom, on the part of either the subject or the agent.

Another area of investigation concerned the pictures which would be used as target material. Prior findings (a complete review

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1. This study has been published as a research brief (Delanoy, Parker and Wilson, 1981): it is reproduced in Appendix 4.

of these lies outwith the scope of this work: reviews have been published by Carpenter [1977], and Palmer [1978]) have indicated that a subject's choice of target may be influenced by his preference (or lack of such) for it. Williams and Duke (1980) demonstrated that subjects' ESP scoring was significantly higher when they liked the target, than when they did not. Similar findings have been reported by Schmeidler (1964), Hebda, Velissaris, and Velissaris (1974), Nash and Nash (1969), and Rao (1962). However, in a second experiment Rao (1963) found a significant reversal of his original results. This relationship was further explored in Experiment I, by comparing subjects' target preference ratings with the order in which they were ranked, and then with psi scoring.

In this pilot study the only hypothesis was that significant above-chance psi scoring would occur. The planned analyses were:

1) The primary overall psi scoring analysis would be a sum-of-ranks (Solfvin, et al., 1978). Following Sargent's (1980a) suggestion, the full rank data would be provided, which would allow other researchers to examine the results, using any analyses they chose. For the purposes of evaluating the line of ganzfeld research, this sum-of-ranks analysis should be used to represent the study's outcome.
2) A secondary overall ESP scoring analysis would be conducted, based on the binary hit rate.
3) The scoring of each subject was to be examined by means of a sum-of-ranks, to determine if any subject performed significantly

better than the others.

4) To examine for possible target preference effects, the preference ratings given to the higher ranked pictures (ranks 1-3) would be compared to those of the lower ranked pictures (ranks 4-6), by means of a Mann-Whitney U test.

5) If the above analysis yielded a significant result, it would raise the possibility that the rank given to the target was influenced by the subject´s preference for that picture. To check for this possibility, the rating given to the target picture when it was alloted a high rank (ranks of 1-3) would be compared to that allotted a low ranked (ranks of 4-6) target, using a Mann-Whitney U test.

## §4.2 METHOD

### Design

To enable the author to experience all areas of the experimental ganzfeld situation, a three-participant (of which she was one), thirty-session design was adopted, whereby the experimenter would also serve as a subject, and as an agent. Each participant underwent ten ganzfeld sessions as the subject. As well as acting as the subject, each also acted as the agent for ten sessions, five for each of the other two participants. In the sessions where the participant was the agent, he was also responsible for acting as the experimenter; in scheduling the session, readying the experimental equipment for the session, putting the subject into the ganzfeld, selecting target material, and signalling the end of the session.

## Participants

The three participants were the author, Adrian Parker, and Kathy Wilson. Due to the many roles which each participant had to enact, the author was fortunate to enlist the assistance of two co-participants who had considerable experience in parapsychological research. Dr Parker's Ph.D. research was concerned with examining experimenter effects in parapsychology, and he also had had prior experience with the ganzfeld (Parker, 1975; Parker et al., 1977). Miss Wilson was a fellow post-graduate investigating parapsychology at the time of this study, although she had had no experience with the ganzfeld. The author had been a subject in one previous ganzfeld session. All of the participants were very interested in taking part in the experiment, and expectations of success were high.

## Targets and Target Selection

Each participant selected pictures for the ten target packs which would be used when he or she was the agent. Each target pack consisted of six pictures, chosen to be as different from each other as possible in terms of content, colour and form. The pictures used were postcards, art prints and/or cut-outs from magazines. Duplicate sets were used by the subject and the agent, so that no sensory cues could be passed from the agent to the subject by means of the target pictures. No target set was used in more than one session.

Selection of the target picture for each session was determined by means of a random number generator at the beginning of each sending period.

Setting

The experiment was conducted in three rooms in the Psychology Department of the University of Edinburgh. The Parapsychology Laboratory, a large, sunny room, was used by the subject for the judging of the target pack. A small room, located off one end of the lab, served as the ganzfeld stimulus room. The agent's sending room was a classroom adjacent to the lab, at the opposite end from the stimulus room.

The experiment was conducted during the spring and early summer of 1980.

Apparatus

The ganzfeld stimulus room contained a large, comfortable, reclining chair, on which the subject lay during the stimulus period. It also contained a desk, upon which was a flexi-pose lamp fitted with a 60 watt red light bulb. A tape recorder, which relayed white noise through headphones to the subject, was also on the desk. A microphone was suspended over the subject's head, to relay the subject's mentations to a second tape recorder.

The sending room contained the second tape recorder. The subject's mentations were recorded on this recorder, which also simultaneously relayed, through headphones, the subject's mentations to the agent. A small portable random number generator was also in this room. Prior to beginning the experiment, the random number generator was tested by an electrical technician, to ensure randomness.

Procedure

The subject would be offered refreshments upon his arrival for the session. When he was ready to begin the ganzfeld stimulus period, the experimenter would take him to the stimulus room. The subject would be seated in the reclining chair and offered a choice of either green- or red-tinted, halved ping pong balls, each fitted into a goggle-type mask made of foam. The mask would be fixed to the subject's face by means of surgical tape, which could be removed painlessly from the subject's skin. The mask was fitted so that the subject experienced a homogeneous visual field.

The red light was positioned at a distance of approximately one to two-and-a-half feet from the subject's face, the distance being dependent upon the subject's preference. The headphones were then fitted on the subject's head and the volume of white noise adjusted to be loud, but still pleasant. When the subject indicated that he was ready for the stimulus period to begin, the experimenter would turn on the white noise tape, and immediately make his way to the sending room. The subject remained in the ganzfeld for thirty minutes, during which time he would say aloud all thoughts, sensations, imagery, and/or emotions which he experienced. The end of the thirty minute stimulus period was signalled to the subject by means of a ringing telephone.

Immediately upon leaving the subject the experimenter would note the time, and then proceed to the sending room. There he would determine, by means of the random number generator, the target picture for that session. He would then turn on the tape recorder, which was recording and simultaneously relaying the subject's mentations to the agent.

The experimenter then adopted the role of the agent. He would now remove the target designated by the RNG from the target pack, and concentrate on sending the chosen target picture to the subject for approximately 25 minutes.

When he observed that the end of the subject's thirty minutes of ganzfeld stimulation had nearly been reached, the agent would leave the sending room, leaving the agent's sending materials in the room, and slip the subject's duplicate target pack under the door of the lab, where the judging would take place. He would then go to a telephone on a lower level of the building and phone the extension located in the lab, close to the sending room. The volume of the telephone's bell had been adjusted so as to be loud enough to be heard, over the white noise, by the subject. The agent would allow the phone to continue ringing until the receiver was picked up by the subject. The agent would then hang up, without exchanging any communication with the subject.

Upon hearing the ringing of the telephone the subject would remove himself from the ganzfeld. He would pick up and replace the telephone receiver, to break the connection, without communicating with the agent. He would then retrieve the duplicate target pack from under the door, and proceed with the judging of the six pictures.

The subject received no specific judging instructions. As there were no means by which the subject could review his mentations, his judging was based upon his memory of his experiences whilst in the ganzfeld. The subject would rank-order the pictures, according to their degree of correspondence to his remembered experiences in the ganzfeld. When the subject had completed the judging he would contact the agent, who was waiting in the sending room. The agent would not give the subject any feedback as to the identity of the actual target at this time.

When all thirty sessions had been completed, each participant rated, on a 1 to 10 scale, the six pictures in each of the ten target sets which which he had judged as subject, according to his personal preference for the pictures. The pictures in each target set were considered independently from those in other sets when the preference ratings were made. At the time of making the preference ratings, the subjects had not yet received feedback as to the identity of any of the target pictures. After the subjects had completed their preference rating of the pictures, they were given feedback as to the identity of the various target pictures. Thus it was not until all the testing sessions had been completed that anyone other than the agent knew the identity of the target picture for any given session.

## §4.3 RESULTS

All of the following analyses were pre-planned, except where otherwise stated.

The primary measure of overall ESP scoring was a sum of ranks (Solfvin et al., 1978), where p = 1/6. The mean chance expected (MCE) sum of ranks was 105, the obtained sum of ranks, 97. The difference between the two is not significant (corrected for continuity, z = 0.80: n.s.). A secondary analysis, examining the binary hit rate (p = 1/2) by means of a sum of ranks, also was not significant (MCE sum of ranks = 45, obtained sum of ranks = 43; z = 0.55: n.s.).

The scoring was fairly evenly distributed between the participants. No individual participant deviated from chance scoring (p = 1/6, MCE sum of ranks = 35; Delanoy, sum of ranks = 30, z = 0.83: n.s.; Parker, sum of ranks = 34, z = 0.09: n.s.; Wilson, sum of ranks = 33, z = 0.46: n.s.). The distribution of rankings, by individual participants and overall, is presented in Table 4.1.

Table 4.1: Target Distribution According to Assigned ranks, Listed by Subject, and Overall

| Target rank = | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Subject: | Delanoy | 2 | 3 | 2 | 1 | 0 | 2 |
| | Parker | 3 | 0 | 1 | 4 | 0 | 2 |
| | Wilson | 2 | 3 | 1 | 1 | 0 | 3 |
| | Overall | 7 | 6 | 4 | 6 | 0 | 7 |

To examine whether subjects' ranking of the target packs was influenced by their liking for the pictures, the preference ratings given to the pictures receiving a high ranking (ranks 1-3) were compared to those receiving a low ranking (ranks 4-6). The higher-ranked pictures received preference ratings significantly higher than the lower-ranked pictures: Mann-Whitney U test; sample 1 =

30, sample 2 = 30, U = 243, z (with tie correction) = -3.07, $p = 0.001$. Thus, the subjects did give higher ranks to pictures which they preferred, to a significant degree. This could indicate that the ESP scoring may have been biased by whether or not the subject liked the target for any given session.

To examine this possibility, a Mann-Whitney U test was used to compare the preference ratings given to the target picture when the target received a high (ranks 1-3), versus a low (ranks 4-6), ranking. This analysis proved not significant (sample 1 = 17, sample 2 = 13, U = 100, z (with tie correction) = -0.33: n.s.), indicating that the ESP scoring had not been biased in this manner.

Shortly after this study had been completed, Sargent (1980a, Exp. VI) published an experiment of a similar design, in which he was investigating the role of the agent. Sargent's study prompted a post hoc anaylsis, to see if any agent effects may have influenced the scoring. Sum of ranks analyses were performed on the basis of the ranking of the targets according to who was the agent for each trial. Again, the target rankings were relatively evenly distributed between agents, with no agent scoring significantly above chance ($p = 1/6$, MCE sum of ranks = 35; Delanoy, sum of ranks = 34, z = 0.09: n.s.; Parker, sum of ranks = 30, z = 0.83: n.s.; Wilson, sum of ranks = 33, z = 0.46: n.s.). Nor was there any marked difference in the scoring patterns between the subject/agent pairs. The distribution of rankings for agents and each of their subjects is given in Table 4.2.

No increase in scoring across trials was predicted in this study, as no feedback, which may have allowed the subjects to develop successful scoring strategies, was given to the participants. However, as a further ganzfeld experiment was planned which would utilise a multiple-session design to improve subject scoring across trials, post hoc analyses, examining whether there was a scoring incline or decline across sessions, were performed on the data.

Table 4.2: Target Rankings Listed by Agent And Subject

| Target Rank = | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Agent / Subject: | | | | | | |
| Delanoy / Parker | 2 | 0 | 0 | 2 | 0 | 1 |
| Delanoy / Wilson | 1 | 1 | 1 | 0 | 0 | 2 |
| Parker / Delanoy | 1 | 2 | 0 | 1 | 0 | 1 |
| Parker / Wilson | 1 | 2 | 0 | 1 | 0 | 1 |
| Wilson / Delanoy | 1 | 1 | 2 | 0 | 0 | 1 |
| Wilson / Parker | 1 | 0 | 1 | 2 | 0 | 1 |

These analyses correlated the subjects' performance with session number, using the Spearman rank-order correlation coefficient. An overall correlation between the mean rank assigned to the target by all subjects for each trial, with that trial number, was not significant (Rho = 0.05, N = 10, Df = 8, t = 0.16: n.s.); and similar correlations, between trial number and the rank given to the target by each subject, were similarly not significant (in all cases N = 10 and Df = 8: Delanoy, Rho = 0.04, t = 0.12: n.s.; Parker, Rho = 0.52, t = 1.71: n.s.; Wilson, Rho = -0.29, t = -0.86: n.s.).

## §4.4 DISCUSSION

The lack of significant psi scoring was a great disappointment to all the participants. The other analyses shed little light on why significant psi-hitting was not achieved. The target preference analyses demonstrated that preferred pictures received significantly higher rankings than the less well liked pictures. This preference biasing effect may have negatively affected the psi scoring, if the target pictures had received a lower preference rating, when assigned lower rankings, than when they received higher ranking. However, unlike other findings (Schmeidler, 1946; Hebda, Velissaris, and Velissaris, 1974; Williams and Duke, 1980), this biasing did not relate to psi scoring. Thus it appears that the lack of significant psi scoring in this study is not related to whether or not the subjects liked the target picture.

The lack of any apparent agent effect, or scoring incline/decline, was not surprising. None was predicted nor anticipated. The post hoc analyses were made mainly to ensure that these had not been factors in the obtained scoring. As no agent effect, nor any scoring incline or decline across sessions, was observed, it is doubtful that these factors influenced the study's outcome. Tart's (1966) immediate-feedback training method postulated that by receiving immediate feedback as to the effectiveness of various sending strategies, the agent may learn to improve his sending performance. Such feedback was provided in this study, as the agent heard the subject's mentations, as they were being made. However, as no scoring inclines were observed, there is no evidence that the agents were able to learn to send more effectively.

The participants had all started the study with high hopes for success, and all enjoyed their experiences in the ganzfeld. Until the actual analysis of the results was completed, the subjects were hopeful that extra-chance scoring had occurred. However, as the sessions progressed, it became apparent that certain aspects of the methodology could be perceived as having a possible negative effect on the ESP scoring.

These factors are not of the type that can be criticised on a purely technical level. In those respects the experiment was generally sound, providing the basic ingredients of a typical ganzfeld ´recipe´ (ie, full visual and auditory stimulation, red visual field, white noise, and stimulus duration of thirty minutes). It also contained a proper method of randomization, although it´s security precautions would have been greatly improved had the subject´s target pack not been slipped under the door by someone (ie, the agent) who was aware of the identity of the target. Rather, the possible shortcomings which will be identified belong generally, to the relatively intangible area of parapsychology which concerns the general state of mind of the subject. For example, most parapsychologists are careful to create a pleasant, comfortable experimental environment for their subjects, and the importance of a friendly, warm experimenter has also generally been accepted as an important part of psi-conducive experimentation. Yet such subjective qualities are difficult to measure quantitatively, and their precise role in psi experimentation has not been established. Thus the importance of these factors is generally a matter of common sense, intuition, and speculation.

One way in which the subjects' state of mind may have been adversely influenced involved the manner in which the end of the stimulus period was signalled to the subject. The ringing of a telephone was used as it was thought to be a simple way to end the stimulus period, which would not allow any sensory cueing to occur.

However, in pratice this method proved to be unsatisfactory. The effect upon the subject was similar to that of being suddenly awakened from a pleasant dream by the jarring ring of a telephone. Upon hearing the ringing, the subject had rapidly to extricate himself from the goggles and headphones and make his way to the phone. This created an abrupt change in the subject's state of consciousness, and was generally perceived by the participants to be an unpleasant experience.

The unpleasantness which the phone ringing created may have negatively affected the subjects' ESP scoring. The conscious or unconscious 'waiting' for the phone to start ringing may also have had an inhibitory effect on the receiving of target-related psi impressions during the stimulus period. Another possible outcome may have been to leave the subjects in a frame of mind ill-disposed to the judging task ahead of them. The sudden removal from the comfortable, relaxed state induced by the ganzfeld may even have made them subconsciously resentful of the judging procedure.

Another aspect of the methodology which may have had an effect on the psi scoring was that the subjects were not able to review their mentations before the judging. This meant that they had to rely upon memory to recall what they had experienced whilst in the ganzfeld. This lead to the possibility of the subjects not remembering all of their mentations, particularly those experienced during the beginning of the stimulus period. Furthermore, it made an accurate interpretation of the mentations they did remember quite difficult. The subjects tended to have a clearer memory of those mentations which had some emotional meaning for them, and/or those which were unusual or surprising in some respect. These factors may have influenced the subjects' judging; but whether such an influence would aid or hinder significant psi scoring has not yet been determined.

It can be argued that the judging may have been improved by these factors. Sargent (1980a, p. 74) stated: 'psi-hitting is generally associated with spontaneous and bizarre mental activity.' Thus, as the subjects reported being more likely to remember unusual or surprising (ie, bizarre) imagery, a selective memory factor, favouring psi-hitting, might have been operating.

Research also has suggested that more target-related mentations are received during the latter part of the stimulus period than in the beginning (Sargent, 1980a). This opinion is obviously held by Braud, as his ganzfeld studies typically utilise only the last five minutes of the stimulus period for sending. Thus, forgetting, or placing less emphasis on the mentations received early on in the session, may not have negatively affected the scoring. However, research in this area is still in the preliminary stages, and no firm conclusions can yet be made regarding whether mentations produced later in the stimulus period have a greater psi content than those produced earlier.

There is also evidence which suggests that not reviewing mentation records before judging may detrimentally affect the scoring rate. The degree to which the ganzfeld alters the subjects´ state has been found to correlate with ESP scoring (Palmer _et al._, 1977; Palmer _et al._, 1979; Sargent, Exps. I-III & Exp. V, 1980a). These findings suggest that a high degree of an altered state tends to correlate with psi-hitting, and lower shifts in state are correlated with psi-missing (this suggestion was first made by Palmer _et al._, 1977). As a subject´s memory is likely to become less accurate as the degree of altered state increases (Parker, 1975; Vogel _et al._, 1972), the subject would be least likely to remember those impressions which occurred when his state was most altered (_ie_, when he possibly was most receptive to psi influences). This may therefore suggest that a negative effect on scoring occurs if mentations are not reviewed before judging takes place.

It would seem that the safest course for the present is to try to weigh all of one´s mentations equally during the judging. This was not possible in Experiment I, and may have contributed to the lack of significant ESP scoring.

A further part of the experimental design which may have influenced the scoring concerns the lack of trial-by-trial feedback.

In this study the subjects did not receive any feedback as to the success or failure of each trial until all the testing had been completed. This was done because two of the participants felt that their motivation, and therefore their performance, might be negatively affected if they were not scoring well, and were aware of the fact. They were similarly worried that if they were aware of scoring successfully, they might feel under great pressure to continue doing so, and this also might negatively affect their subsequent performance. In retrospect this seems to be possibly misguided reasoning. A more positive, and productive, attitude would have been to realise that with feedback after each trial, one would be able to recognise successful, and unsuccessful, judging strategies, and adjust one's judging accordingly.

The above discussion regarding factors which may have detrimentally influenced the study's outcome is speculative in nature. It is equally plausible that these factors exerted no influence upon the subjects' performance. If this were the case, then this study provides no support for viewing the ganzfeld as psi-conducive technique.

The use of target sets selected by three different people gave rise to some unanticipated observations. The target sets were selected by each participant so as to contain pictures which they believed would make effective target pictures from the perspective of both the subject and the agent (each of whom selected the pictures which they would be sending). This resulted in each participant chosing pictures which appealed to them for a variety of reasons.

One participant tended to chose pictures which he perceived as containing interesting, strong imagery. This participant thought that such targets might create an equally strong impression upon the receiver. In fact, the other participants reported finding some of these pictures unpleasant and commented that they would not be surprized if they avoided, on an unconscious level, receiving such imagery. Another participant often chose targets which he thought to be amusing. However, the other participants, having different senses of humour, often perceived the pictures in a very different manner from that intended by the agent. The third participant tended chose pictures which he thought conveyed relaxed, pleasant scenes. These pictures frequently portrayed people whom he perceived as attractive. The other participants reported finding many of the scenes rather bland and uninteresting. Furthermore, the other participants proved to have a very different concept of what constituted an attractive person.

These observations demonstrate that different people appear to have different ideas about what constitues a good target. To date, very little research has been conducted examining what makes a good target. However, as the selection of target pictures is a potentially important component of any free-response study, how might a researcher best chose target pictures in order to obtain pictures which would appeal to the largest possible number of people?

Ideally, having a large number of subjects screen a large number of pictures, rating them for general characteristics such as perceived pleasantness, interest, and preference, would allow a researcher to eliminate those pictures which appeared to differ from the mean rating in relation to any given characteristic. The remaining pictures could then be grouped into target sets so that all the pictures in any given set received similar characteristic ratings. This procedure would ensure that the targets chosen would appeal to the greatest possible number of subjects, and would ensure that each set contained pictures which were perceived as being relatively equal in terms of the characteristics being examined.

Unfortunately, such an undertaking is outwith the means and scope of this thesis. For the purpose of the future studies of this thesis (Experiments II and III), the author decided to select target sets according to a few general principles, suggested by some of the comments made by the participants in the present experiment. In applying these principles to future target selection the author would seek to be as objective as possible, while acknowledging that by necessity many of her decisions would be highly subjective.

The guidelines to be applied in Experiments II and III are as follows. Firstly, pictures would not be selected if the author perceived them to be unpleasant or threatening in any way. Thus, portrayals of war scenes, human or animal deprivation, and possibly scary science fiction scenes were not included in any target sets. Secondly, pictures which contained a potentially erotic component, such as a girl in a bikini or paintings or statues containing naked figures, were also excluded due to possible differences in perception by subjects of different sexes and/or differences in subjects' sexual perferences. Thirdly, due to differing religious affiliations among subjects, no overtly religious themes were contained in the pictures. Finally, while pictures should be generally perceived as interesting and distinctive, these features should not be idiosycratic to the author or reflect her personal preferences.

A major goal of this study was to familiarise the author with the ganzfeld technique. In this respect the experiment was a success. The ganzfeld technique was found to be fun, and an enjoyable experience, whether viewed from the perspective of the subject, the agent, or the experimenter.

As subjects, the participants found the ganzfeld stimulus period to be relaxing and comfortable. It was interesting to pay attention to the many thoughts and images which are constantly crowding one's mind, but seldom attended to. Furthermore, the pleasure of the experience did not diminish with repetition.

The role of the agent was also perceived as enjoyable. A major contributing factor to this was hearing the subject's mentations, as one was sending. This provided a source of instant feedback to the agent, which had the effect of keeping one thoroughly absorbed with the sending process throughout the stimulus period. The change of target material, and mentation content, with each session, ensured that the agent did not become bored as the sessions progressed.

From the perspective of the experimenter, the ganzfeld was found to be a simple technique to work with, which kept the experimenter's motivation and interest at a high level. The experimenter knew that the subject and agent would enjoy their roles in the study, and that they were unlikely to feel that they were being imposed upon by taking part in the experiment. Furthermore, the experimenter received frequent feedback as to the apparent success of the technique in eliciting psi. Even though no evidence of ESP was obtained, it seldom occurred that a session did not yield some mentations which appeared to correspond to the target. While such correspondences may have been chance occurrences, they nevertheless served to reinforce the experimenter's belief in psi, and the technique's ability to produce it. Thus the experimenter's motivation was reinforced throughout the experiment, and each session was approached with a genuine sense of excitement and interest.

## CHAPTER FIVE

## EXPERIMENT II: THE TRAINING OF PSI IN THE GANZFELD [1]

### §5.1 Introduction

#### The Problem of Transformation Errors

Transformation errors which may occur in ESP responses have been considered in Chapter 3. Whilst no ganzfeld experimenter has provided as detailed a consideration of these errors as has Warcollier (1938, 1948/1963), the occurrence of these errors has nonetheless been noted in ganzfeld work. Terry and Honorton (1976) have commented that psi influences ´frequently occur as bits and pieces of the stimulus, distorted and transformed by the cognitive processes of the subject´ (p. 215). Rogo (1976b) identified three types of errors which a gifted subject he tested commonly made (Rogo, Exp. II, 1976a):

1) fragmented assimilation; where the subject focused on a part of the theme;

2) global impressions; where the general theme is represented, but with no specific reference to actual parts of the target; and,

3) symbolic representation of the target; which contains no specific references to either the actual content of the target or to its general theme.

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1. This study has been previously published (Delanoy, 1982). A copy of the paper is reproduced in Appendix 5.

Palmer et al. (1977) have similarly noted several types of imagery errors which are characteristic of how ESP manifests itself in free-response experimentation:

> 1. Images that were related to elements of the picture in ways not readily identifiable, especially formal correspondences ... (ie, correspondence in shape or form).
> 2. Images that corresponded to isolated fragments of the picture, but not to the picture as a whole or to its general theme. (p. 138)

These 'errors' in ESP responses are not normally regarded as errors per se. Rather, they are usually viewed as resulting from the mental processing of the psi impression, which occurs at some point between the receiving of the influence and conscious awareness of that influence (as pointed out in the above Terry and Honorton quotation). It should be mentioned that, like Warcollier (1948/1963) and Hastings (1976), neither Rogo (1966b) nor Palmer et al. (1977) considered the 'error' factors listed above, as such. Rather, they were delineating various response characteristics found in their research. Nonetheless, these response characteristics can result in psi-related information not being recognised.

Palmer et al. (1977) found that independent judges obtained differing results when judging the same data set. They determined that the two response characteristics listed above were partially responsible for the difference in judging outcome. That is to say, one judge was perceiving various correspondences which were escaping the notice of another judge.

Given the common occurrence of such response characteristics, it seems likely that various judges would notice varying degrees of correspondence between responses and target pictures. To date, seven ganzfeld experiments have reported results which were judged by more than one person (Child and Levi, 1980; Dunne et al., 1977; Palmer et al., 1977; Palmer et al., 1979; Palmer et al., 1980; Stanford, 1979). Four of these studies reported on whether or not scoring varied between judges. Palmer et al. (1977) obtained significant psi-missing from the judging of independent judges, whereas the scoring based on the subjects' judging did not differ significantly from chance. The study also observed a significant difference between the two independent judges when specifically examining the data for displacement.

Palmer et al. (1979) had the results of their study evaluated by the subjects, and then by two sets of independent judges. They found a significant difference between the subjects' judging and that of both sets of independent judges. The two sets of independent judges obtained results which differed from each other, but not significantly so. The two remaining studies, Sondow (1979), and Child and Levi (1980), did not obtain significantly different results between the subjects' and the independent judges' judging, although some differences between the judges were noted.

These studies emphasise the differences which can occur when different people judge the same set of data. Nor are such differences surprising, given the complexity of free-response judging procedures. The response errors which occur in free-response studies may greatly contribute to these differences, as noted by Palmer <u>et al.</u>, (1977). The degree of transformation of the ESP response which occurs may render it recognisable to some judges, but not to others.

One study has been conducted specifically to address this problem. Sondow (1979, p. 124) noted that '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.'

To further examine this issue, Sondow conducted a ganzfeld experiment aimed at 'increasing the recognition, after the fact, of a psi influence on seemingly independent thoughts' (p. 124). To accomplish this, she incorporated two conditions into her study. One, the association condition, required the subjects to make any associations to their mentations which occurred to them. Thus, after having made their mentation reports whilst in the ganzfeld, the subjects would review their reports, adding any personal (idiosyncratic) or general (consensual) associations which they had to various mentation items.

The second condition, feedback, consisted of giving the subject feedback as to the correct target identity as soon as the subject had completed the judging of the target pool. The experimenter and subject would then review the subject's mentation report, looking for correspondences to the target which might help the subject to learn to recognise psi-mediated responses.

Twenty subjects, ten in each condition, participated in five ganzfeld sessions each. The association group received no feedback as to session outcomes until they had completed all five sessions. The feedback group received feedback after each session, in the manner described above.

The overall results revealed highly significant psi-hitting ($p < .0004$, two-tailed). An examination of the scoring, by condition, demonstrated that the association group was entirely responsible for the significant psi scoring, with the feedback group scoring almost exactly at chance, the scoring difference between the two conditions being significant ($p < 0.02$, two-tailed). The data from this experiment was also analysed by two independent judges. The results, based on their analyses, revealed no significant psi scoring, either overall or for each condition. However, when given the associations made by the subjects in the association condition, a significant degree of psi-hitting ($p < 0.02$, two-tailed) was obtained. Thus, it appears that the subjects' associations provided enough additional information to change non-significant to significant judging.

An across-session analysis by condition revealed that the scoring of the association group declined slightly across sessions, whilst that of the feedback group remained relatively stable. Thus, neither of the two conditions provided any indication that either treatment (feedback or association) could aid in psi learning. It should be mentioned that the feedback given in this study was not immediate, as was the case in the Braud and Wood (1977) study. Thus, the feedback condition in this study does not fulfill the necessary conditions, specified by Tart´s (1966) feedback method, required for learning to occur.

Sondow´s study was the first to be specifically aimed at trying to decrease the effects of the ´error´ content in ESP responses. Her results have been criticised by Sargent (1980b), who faulted various procedural aspects of her experimental design. He also raised the possibility that the results based on the subjects´ judging could be explained by greater length of time spent on the judging in the association condition. Sargent also noted that due to the many analyses carried out on the data, the finding of the independent judges could be spurious, due to over-analysis.

In defending her study, Sondow (1980) argued that the procedural flaws noted by Sargent were unlikely to have accounted for her results. The use of mutiple analyses was defended on the basis of the study being exploratory (employment of multiple analysis in exploratory studies is most useful, in Sargent´s (1980a), and, others´, opinion). Sargent (Exp. V, 1980a) also noted that it is the usual practice in his ganzfeld experiments to ask the subject to consider his associations to his mentations whilst judging.

Multiple-Session Experiments to Test for Learning

A multiple-session design was employed in Experiment II of this thesis, to enable examination of cross-session scoring patterns. If subjects were able to learn to recognise ESP responses, despite various transformations, it was anticipated that their scoring would improve as their proficiency in recognising such transformation 'errors' increased.

The use of a multi-session design also raised the possiblity of another form of learning occurring: through repeated experience of the ganzfeld, the subject might become aware, either consciously or unconsciously, of certain internal cues which may possibly accompany or signal an ESP response (Honorton, 1977; Tart, 1977b).

Six previous studies have employed multi-session designs, consisting of a minimum of five ganzfeld sessions, in which learning via internal cues might have been possible. They are: Delanoy _et al_., 1981 (Experiment I of this thesis); Rogo, Exp. II, 1976a; Sargent, Exp. VI, 1980a; Ashton _et al_., 1981 (also reported as Sargent, Exp. IV, 1980a); Braud & Wood, 1977; and Sondow, 1979. Of these, one ( Rogo, Exp. II, 1976a), reported a decline in scoring across eight sessions. Braud and Wood (1977) reported a scoring incline, but this was credited to the use of immediate feedback, a procedure not employed in the other studies. Sondow (1979) reported a scoring decline in one condition, but not the other. No across-session scoring effects were found in Delanoy _et al_. (1981). The other two studies do not report across-session scoring. Sargent (1980a) comments that the Ashton _et al_. (1981) study was conducted in part to examine whether 'learning appeared to take place with sufficient practice' (p. 47), but no results relevant to this possibility were reported. Thus there is no evidence to suggest that repeated exposure to the ganzfeld is, of and by itself, likely to lead to improved psi-scoring.

General Aims and Rationale of Experiment II

Sondow's (1979) results are indicative of the possible usefulness of trying to increase the subject's awareness of the potential ESP-related information contained in mentations which may be transformed and/or otherwise unrecognisable. Experiment II represented an attempt to investigate this possibility further. Specifically, it was hoped that via a detailed judging procedure, followed by an introspective examination of the mentation report and the target picture by the subject and the experimenter, the subject would learn to recognise ESP imagery which had been transformed and thus was not readily recognisable.

In order to accomplish this it would first be necessary to elicit responses which contained ESP-related information. The ganzfeld was chosen as the procedure to be used, due to its apparent success in eliciting ESP (Honorton, 1977, 1978a; and as discussed in previous chapters).

Two other factors have been frequently associated with psi-hitting: the personality trait of extraversion (Sargent, 1981b; Palmer, 1977, 1978) and belief in, or experience of, ESP (Palmer, 1977, 1978). This latter condition is commonly referred to as being a 'sheep', as compared to a 'goat', - someone who has not had, and does not believe in, ESP experiences. It was hoped that by testing extraverted sheep, in the ganzfeld, the possibility of eliciting ESP resonses would be maximised.

If internal cue learning were to occur in the second experiment, it was hoped that it could be differentiated from transformation-error learning by examining the introspective reports. If, as the sessions progressed, the subjects´ responses contained a greater amount of ESP-related information, or if greater emphasis seemed to be placed on target-related responses, this would most likely be due to learning via internal cues, as these effects could not be explained by learning to recognise, after the fact, transformation errors. If error recognition was responsible for scoring inclines, this would be readily identified in the course of the introspective discussions.

It is also possible that these learning factors may interact. Thus, learning to identify internal cues, due to feedback after the judging, followed by a detailed discussion relating mentational items to the target, could improve awareness of certain internal cues, as hypothesised by Sondow (1979). Such an effect was not anticipated, as none was observed in Sondow´s study. However, if a combination of these two learning factors was at work, this also should be discernable by examination of the responses.

Improved psi-hitting across sessions may be due to learning by the agent rather than the subject. Tart´s feedback training method (1966) raises the possiblity that, if given immediate feedback as to the effectiveness of various sending strategies, the agent might learn sending techniques which improve the subject´s ESP scoring. Experiment II was designed so as to provide such feedback to the agent.

As will be further discussed in the next chapter, the precise role or influence of the agent in ESP experimentation is largely unknown (Palmer, 1978). However, it is possible that different agents, using a variety of sending methods and having differing relationships with the subject, may have different influences upon the subject's ESP scoring (Carpenter, 1977). Thus, the use of different agents could lead to variability in the subject's scoring which would not be present if only one agent was used. In an attempt to eliminate any possible 'agent-variance' effects, only one agent was to be employed in this study. This would also increase the possibility of an 'agent-feedback-learning' effect occurring, as the agent would experience many sending periods, all with immediate feedback. It was thought that, due to receiving immediate feedback, the agent might be able to identify certain sending strategies which appeared to be associated with target-related responses.

## §5.2 Experiment II: Specific Goals and Planned Analyses

The role of the agent, and possible information about sending strategies which he might reveal, were viewed as secondary goals, arising from the design of this study. The primary goal of this study was to teach subjects to identify, and correct for, transformation errors.

The main hypotheses were that above-chance ESP scoring would be elicited, and, that scoring would improve across sessions. It was further proposed that information relating to the occurrence of transformation errors in ESP responses might be obtained. From this information, strategies to attempt to overcome such errors could be developed. It was also anticipated that information relating to the efficacy of various sending strategies might be gained by the agent.

The information gathered from subjects and agent would be subjective and generally unquantifiable in nature. Therefore, no direct analyses of these factors were to be made. However, it was anticipated that such information would provide data for future research. The planned analyses (all were two-tailed) were:

1) Overall ESP scoring would be determined by means of a sum of ranks (Solfvin _et_ _al_., 1978). This analysis was to represent the study for the purpose of evaluating the ganzfeld line of research.

2) The overall scoring of each subject would be analysed by means of a sum of ranks (Solfvin _et_ _al_., 1978).

3) Across-session scoring would be examined by means of a Spearman rank correlation coefficient, correlating session number with the rank alloted to the target.

4) The scoring of each subject would be examined for across-session scoring trends by means of a Spearman rank correlation coefficient, as in analysis 2.

## §5.3 Method

### Design

The study used the ganzfeld technique in a multi-session design, whereby each subject experienced twelve ganzfeld sessions. The experimenter would be the agent in all sessions. The agent was to note any sending strategies which seemed associated with target-related responses by the subject. At the conclusion of the judging procedure of each session, the experimenter and subject would review the session, paying particular attention to response/target correspondences contained in the subject's mentations, and to his subjective experience of these responses.

Subjects

Six selected subjects participated in the study. They were chosen on the basis of: above-average scoring for extraversion, as measured by the Eysenck Personality Inventory (Eysenck and Eysenck, 1964); and belief in, and experience of, ESP, as measured by the Thalbourne and Haraldsson (1980) Sheep/Goat Scale. No subjects were accepted if they scored above the population average on the lie scale of the Eysenck Personality Inventory.

The subjects, four males and two females, varied in age from 21 to 45. Five of them were students; two were undergraduates, and three, post-graduates. The subjects were recruited by two means. Four were personal friends of the author, who had expressed interest in her work. The other two regularly attended fortnightly seminars organised by the Parapsychology Laboratory at Edinburgh University, through which they learned of the study. All of the subjects had a warm, friendly relationship with the experimenter, but none were especially intimate friends. All were very eager to participate in the study.

The experiment took place between November 1980 and April 1981. The sessions for the first three subjects were conducted between November 1980 and February 1981. The testing of this group was interrupted by the Christmas holiday. The last three were tested during March and early April 1981, with no interruptions. The first three subjects averaged between one and two sessions per week.

The last three participated in two sessions per week.

Targets and Target Selection

The target pool consisted of thirteen target sets, comprised of six pictures each. The pictures were art prints or magazine pictures. The six pictures in each set were chosen to be as different from each other as possible in terms of colour, form, and content. The guidelines for selecting target pictures presented in the Discussion section of the previous chapter, were applied when the experimenter chose the pictures to be used. Duplicate sets were provided for use by the subject, and by the agent, to avoid the possibility of sensory cues being left on the target by the agent.

Target selection for each session was determined, prior to the start of the study, by a number taken from a random number table by a person not otherwise connected with the study. The target set used for each session was chosen so that the agent would not have recently viewed that target pack. This was done to avoid having the agent become overly familiar with the target sets. The target packs were also selected so that no subject encountered the same set more than once.

Setting

The study was conducted in the large Parapsychological Laboratory in the Department of Psychology at the University of Edinburgh. The same small room as in Experiment I was used as the ganzfeld stimulus room. However, this time an area of the laboratory was used by the agent from which to send the target.

The agent, taking all sending materials with her, left the lab before the subject completed the stimulus period. She would wait, either outside the lab or in an adjacent room, for notification by the subject that the judging was completed.

The judging was conducted in an area of the lab near to the stimulus room. This area was located at the opposite end of the room from where the sending had taken place.

Apparatus

As in Experiment I, the ganzfeld stimulus room contained a comfortable reclining chair, and a desk upon which was located a flexipose lamp and a tape recorder. A microphone was suspended over the reclining chair, in which the subject lay during the stimulus period. Halved ping pong balls, embedded in a foam mask, were taped over the subject's eyes so that a totally homogeneous visual field was observed. The mask was attached to the subject by means of surgical tape, which could be easily removed without pain to the subject. The red light was provided by a 60 watt bulb. This was shone into the subject's face from a distance of approximately one-and-a-half to three feet, depending upon the subject's preference, to provide the totally homogeneous red visual field.

The tape recorder relayed via headphones a recording of white noise to the subject. The tape began with relaxing music played at a low volume, over which was taped a brief message to the subjects, instructing them to relax, and reminding them to verbalise all imagery, feelings, and sensations which they experienced whilst in the ganzfeld. The music and recorded message lasted for three minutes. At the completion of the message, a 32-minute-long recording of white noise was played. The volume of the tape was adjusted, according to subject preference, so as to be loud, but still pleasant. The end of the stimulus period was signalled to the subjects by means of an announcment recorded on the tape.

The desk in the lab at which the judging was performed had on top of it a second tape recorder, blank sheets of paper, pens, and, in a drawer, the subject's duplicate target pack. This tape recorder was connected to the microphone in the stimulus room, and recorded all of the subject's mentations. A long lead was also connected to the recorder, which simultaneously conveyed the subject's mentations to the agent, who was located at a different desk, located at the far end of the lab.

Procedure

The subject was offered refreshments upon his arrival for the session. He would then chat with the experimenter about general topics for approximately fifteen minutes to half an hour. When the subject was ready to start the session, the experimenter would lead him to the stimulus room. Once the subject was lying in the reclining chair the experimenter would affix the ganzfeld mask to him, and adjust the headphones, in the manner previously described. When the subject indicated that he was ready for the stimulus period to begin the experimenter left the room, turning on the white noise tape as she did so.

Prior to the subject's arrival, the experimenter would have chosen which target set was to be used for that session, and would have obtained the target slip from the person who performed the target randomisation. These were placed in a hidden location, unknown to the subject. The experimenter did not open the target designation slip, which had been sealed by the randomiser, nor did she look at the contents of the target pack, at this time.

Immediately upon leaving the stimulus room, having started the subject's white noise tape, the experimenter would turn on the tape recorder in the lab which recorded the subject's mentations. She would then retrieve the target sets and target designation slip, placing the subject's target pack in the drawer in the desk where the judging was to be performed. She would then go to the area of the lab from where the sending was to take place, open the target designation slip, and remove the designated target from the target set, without looking at the other pictures in the pack. She then put on the headphones which relayed the subject's mentations. These procedures took less time than the three minutes of music and instructions which preceded the white noise on the subject's auditory recording. The experimenter/agent would then send the target for a period of approximately 28 minutes.

During the sending period the agent would note all responses made by the subject which appeared to be possibly target-related. She also noted what sending strategy was being used when obviously target-related responses were made by the subject. When the sending period had ended, the agent left the lab, taking all the sending materials, including the target, the target set, and the target designation slip with her. At no time during the stimulus period, or subsequent to the completion of the judging procedure, was there any contact between the subject and the agent.

The recorded message, announcing the end of the session to the subjects, also instructed them to remain in the ganzfeld until they felt ready to perform the judging. They then removed the goggles and headphones and proceeded to the lab. There they would rewind the tape containing their mentations, and remove the duplicate target pack from its drawer.

Prior to starting the first session, all subjects had received general instructions about how to perform the judging. These instructions included advising them to examine each of the six possible target pictures in detail, and to consider any associations which they may have had to each of the pictures. They also were to replay the tape containing their mentations, stopping the tape after each response. Each response, or mentation item, was to be examined for any possible correspondences with each of the six target pictures. The subjects were to consider various associations which they had with the responses in evaluating possible correspondences. A running tally of the number of correspondences noted with each picture was to be kept. Having judged all their mentation responses in this manner, they were to rank-order the six pictures according to the pictures´ correspondence to their responses.

When the subjects had completed the judging process they summoned the experimenter. Feedback as to the identity of the target was then given subject. The experimenter and subject then reviewed the subject's mentations. The subject would point out what correspondences he observed, as would the experimenter. These correspondences were carefully examined, in terms of what type of transformation errors they might contain, and what, if any, experiential factors the subject could relate to them. Any other characteristics which seemed to differentiate target-related responses from others were discussed. The experimenter took notes about what was said. Occasionally the discussion moved too rapidly for the experimenter to take accurate notes. When this was so the conversations were tape-recorded, and notes on them would later be made by the experimenter.

These discussions usually continued for from fifteen to 45 minutes. It should be noted that the experimenter was careful to avoid discouraging the subject, if the correct target had not been chosen, or if the subject had failed to notice correspondences which the experimenter had noted. This was accomplished by frequently stressing that this was an exploratory study, designed to learn about the factors which we were discussing. Thus it was not important whether or not the subject scored a 'hit': what was was identifying the ways and means by which target-related responses revealed themselves. It was further stressed that this type of learning could be a slow process, but they were likely to get better as their twelve sessions progressed. These discussions were always presented as a learning experience for the experimenter. Motivation was kept high by the experimenter frequently expressing genuine, enthusiastic interest in, and curosity about, the various factors which were being discussed.

## §5.4 RESULTS

### Statistical Analyses

1. The 72 sessions comprising the study were examined for overall scoring by means of a sum of ranks. This analysis obtained non-significant results (MCE sum of ranks = 252, obtained sum of ranks = 267, z = -1.00: n.s.).

2. The twelve sessions completed by each subject also were examined by a sum of ranks. Two subjects displayed significant extra-chance psi scoring, one psi-hitting (MCE sum of ranks = 42, obtained sum of ranks = 29, z = 2.11, p = 0.034, two-tailed), and one psi-missing (obtained sum of ranks = 58, z = -2.62, p = 0.008, two-tailed). The ranking of the data, overall and by subject, is presented in Table 5.1.

It was observed that there appeared to be a difference in scoring trends between the first three subjects tested and the last three. *Post hoc* sum of ranks analyses were conducted comparing the scoring of the first group of subjects tested to that of the second group. When combined, the scoring of the first three subjects showed significant psi-missing (MCE sum of ranks = 126, obtained sum of ranks = 151, z = -2.39, p = 0.016, two-tailed). The last three subjects' combined scoring did not significantly differ from chance, but was in the psi-hitting direction (obtained sum of ranks = 116, z = .93: n.s.). The difference between the two subject groups is significant: z = -2.35, p = 0.018, two-tailed (the formula for this analysis is presented in Solfvin *et al.*, 1978). It should be noted that the differences between the two groups is largely due to the two subjects who scored significantly. Deleting their scores from that of the others, the two remaining subjects in the first group scored non-significantly in the psi-missing direction (MCE sum

Table 5.1: The Number of Times Each Rank was Assigned to the Target Picture*

| Target Ranks= | 1 | 2 | 3 | 4 | 5 | 6 | Sum of Ranks | Associated z Scores |
|---|---|---|---|---|---|---|---|---|
| Ss. | | | | | | | | |
| A | 2 | 2 | 0 | 4 | 3 | 1 | 43 | -0.08 |
| B | 1 | 1 | 2 | 2 | 3 | 3 | 50 | -1.27 |
| C | 1 | 0 | 1 | 2 | 2 | 6 | 58 | -2.62** |
| D | 3 | 4 | 4 | 0 | 0 | 1 | 29 | 2.11*** |
| E | 2 | 2 | 0 | 4 | 4 | 0 | 42 | ---- |
| F | 2 | 2 | 0 | 3 | 3 | 2 | 45 | -0.42 |
| over-all | 11 | 11 | 7 | 15 | 15 | 13 | 267 | -1.00 |

* A rank of one was given to the picture which had the greatest degree of correspondence to the mentation report.

** p = 0.008, two-tailed

*** p = 0.034, two-tailed

of ranks = 84, obtained sum of ranks = 93, z = -1.02). The two remaining subjects in the second group tested scored nearly at chance (obtained sum of ranks = 87, z = - 0.29), with the difference between these groups being non-significant (z = -0.52).

To correct for multiple analyses, the obtained number of significant outcomes was compared to the expected number of significant outcomes given the number of analyses conducted.[1] Seven pre-planned analyses were conducted on the ranked data. Using an alpha of 0.05, one analysis in every twenty conducted should be significant by chance alone. Conducting seven analyses, less than one analysis (35 percent of one analysis) should, by chance, be significant. Given the findings of two significant outcomes, neither of which is marginally significant, it is unlikely that these results arose from multiple analysis errors. Six post hoc analyses were also made. Adding these six analyses to the seven already conducted, a total of thirteen tests were made on the data. Using an alpha of 0.05, 65 percent of one analysis would be expected to be significant by chance. Whereas, four of these thirteen tests obtained significant outcomes. Again, it is unlikely that these results are due to multiple analysis (see footnote on p. 20).

3. To examine whether scoring improved across sessions, a Spearman rank correlation coefficient was employed, to correlate the rank assigned to the target, with session number. Testing for overall scoring inclines was accomplished by adding the ranks assigned to

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1. The Bonferroni method (Rosenthal, 1978), discussed in Chapter 2, was not used to correct for multiple analysis, as it is believed to be insensitive. An example of the possible use of the method will best demonstrate why this is felt to be so. If twenty analyses were carried out on the same set of data, with an alpha of 0.05 used to establish significance, and every analysis obtained an alpha of 0.05, it could safely be argued that these obtained results represented a strong effect. Using the method employed in this chapter to correct for multiple analysis, one of the twenty

the target by all subjects for each session. This yielded a non-significant outcome (N = 12, Rho = 0.32).

4. Correlations for individual subjects were carried out by correlating the rank given to the target with the appropriate session number. Only one subject obtained a significant correlation (N = 12, Df = 10, Rho = 0.6187, t = 2.49, $p < 0.05$, two-tailed), albeit not in the hypothesised direction. This significant result was due to a decline in the subject's scoring across sessions. Indeed, five of the subjects' scores tended to decline, rather than incline, across sessions. The subject's, whose target ranking showed a significant decline across sessions, ESP-scoring was exactly at chance expectancy (as determined by the sum of ranks analysis). Table 5.2 presents the ranks assigned to the target according to session number.

In examining for scoring inclines, seven tests were conducted. One was found to be significant. Using an alpha level of 0.05, there is a 35 percent chance that one analysis would be significant. Thus, one can not state with certainty that this outcome is valid.

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significant outcomes would be expected by chance at the 0.05 level. The probability of getting more than one significant outcome could be calculated by using the binomial test, and the majority of the twenty results would still be considered to display scoring which significantly deviated from chance expectancy. However, using the Bonferroni method (where the alpha is divided by the number of analyses made to obtain a revised alpha), the revised alpha level of significant deviation from chance would be 0.0025. Therefore not one of the above 20 outcomes would be judged significant. Thus, use of the Bonferroni method may have resulted in a very inaccurate portrayal of study outcome.

However, it is 65 per cent more likely to be genuine, than due to multiple analysis.

Table 5.2: Ranks Assigned to the Target in Each Session Listed by Subject and Overall

| Session Number= | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Rho** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ss. | | | | | | | | | | | | | |
| A | 1 | 2 | 5 | 4 | 6 | 5 | 4 | 4 | 1 | 2 | 5 | 4 | 0.083 |
| B | 5 | 2 | 4 | 5 | 4 | 3 | 6 | 5 | 6 | 1 | 6 | 3 | 0.107 |
| C | 4 | 6 | 1 | 6 | 6 | 5 | 6 | 4 | 3 | 6 | 5 | 6 | 0.142 |
| D | 3 | 1 | 2 | 2 | 3 | 1 | 2 | 3 | 2 | 1 | 6 | 3 | 0.252 |
| E | 2 | 4 | 1 | 1 | 5 | 4 | 2 | 4 | 5 | 5 | 4 | 5 | 0.619* |
| F | 6 | 4 | 1 | 5 | 5 | 4 | 5 | 6 | 2 | 2 | 1 | 4 | -0.371 |
| Over-all | 21 | 19 | 14 | 23 | 29 | 22 | 25 | 26 | 19 | 17 | 27 | 25 | 0.323 |

* $p < 0.05$, two-tailed

** in all cases $N = 12$ and $Df = 10$; all figures are corrected for ties

It should be noted that these analyses were orginally computed by hand. The analyses were re-checked during the writing of this thesis, using a computer statistical programme ('Statmen', devised by the Dept. of Psychology, University of Edinburgh). While the outcome of the computer analyses usually confirmed the orginal results, three errors in the initial computations were discovered. In the hand-computed analyses of the scoring inclines across sessions, no significant results were found, using a two-tailed test. Due to this computational error, the significant decline found using the computer package, and reported in the above paragraph, was not reported in previously published accounts of this study (Delanoy, 1982; Thalbourne, 1981; and Stanford, 1984). The two other errors concerned the post hoc analyses reported below.

Two final post hoc analyses were conducted at the suggestion of Michael Thalbourne, a colleague of the author with whom she was conducting a study examining the relationship of extraversion and the sheep/goat effect (Thalbourne, Beloff, and Delanoy, 1982). While all my subjects were 'extraverted sheep', Thalbourne thought that it would be interesting to examine whether there was any correlation between ESP scoring and the degree of extraversion and 'sheepishness'. Accordingly, Pearson product-moment correlations were conducted, correlating subjects' ESP rank scores with their extraversion and sheep/goat scores. A significant relationship between degree of extraversion and ESP score was found ($r = 0.74$, $n= 6$, $p = 0.047$, one-tailed), but not between ESP scores and the Sheep/Goat Scale scores ($r = -0.46$). These results were reported by Thalbourne (1981). A subsequent re-analysis of this data has shown the initial analyses to be incorrect, with neither factors correlating significantly with ESP scoring (correlation with extraversion scores, $r = 0.69$; with sheep/goat scores, $r = -0.52$).

Other Findings

The findings reported in this section are based on the discussions which took place between the subject and the experimenter at the conclusion of each ganzfeld session, and on observations made by the agent about successful sending techniques. These findings are all based on informal, subjective observations.

No attempt was made to collect the data in a quantifiable manner. It was felt that more information would be gained if the subjects did not feel constrained to try to fit their experiences to a standardised set of questions. Furthermore, given the number of sessions completed by each subject, it was feared that the subjects would become bored by repeatedly answering the same questions. It was also thought that if the subject's experiences did not match the questions asked, the subject might become frustrated and disheartened with the introspective process which these discussions required.

Nor was there any attempt by the experimenter to quantify the findings after the informal discussions had been completed. To avoid having the discussions biased by the experimenter's own observations, they would have had to be conducted by some other person. This would have eliminated an important part of the discussions, which entailed the experimenter pointing out correspondences which the subject had not noticed. Furthermore, it would have required tape recording all the discussions, having these tapes transcribed by someone not otherwise connected with the experiment, and finally having independent judges examine the transcripts for information related to transformation errors and experiential factors. The personnel and expense which this procedure would involve were not available to the experimenter. Thus, these findings represent the general experience of most of the subjects as related to, and perceived by, the experimenter.

It was intended that these discussions would focus primarily on transformation errors contained within the responses, **after** the responses had been made. However, as the sessions progressed it became apparent that various factors relating to the **making** of responses were having a potentially negative effect on psi-scoring. It soon developed that a substantial proportion of the discussion period was spent considering these.

These factors appeared to be having as great an effect on ESP scoring (or perhaps it should be said ´on the apparent lack of ESP scoring´) as were the transformation errors. Indeed, in some instances they appeared to be responsible for the occurrence of transformation errors. For these reasons, the factors will be presented here in some detail.

Considerations Arising from Subjects´ Experiences

While listening to subjects´ mentations during the sending procedure, the experimenter noticed two factors, related to the making of responses, which appeared to be interfering with the receiving of target-related impressions. The first of these involved the subjects´ treatment of vague, unclear, and/or incomplete imagery. It was noted that when subjects mentioned such imagery, there was a general tendency to quite rapidly re-identify the image as a recognisable, familiar object. Thus, when vague or unrecognisable imagery was experienced by the subject, there appeared to be a rather immediate reaction to try to ´make sense of´ the image.

One example of this involved a target picture consisting of a simple line drawing of an extended golf umbrella, against a plain green background. The colours of the panels of the umbrella were red, white, yellow and blue. The subject, who shall be referred to as subject C, had mentioned the various colours in the target, but not in relation to any specific object. He then stated that he saw a 'floating, half-circle' which he immediately identified as 'having lines in it, segmented-like'. His next comment was 'I can't make out what it is...[short pause]...oh, it's the dome of a church'. The subject did not connect these features with the target during the judging period.

All of the subjects displayed this tendency to try to identify unclear or unrecognisable imagery as some recognisable object. This could give rise to the type of transformation error where the shape or form of the target is correct, but its meaning or idea is lost. Errors of this type will be referred to as 'mis-naming errors'.

In order to avoid mis-naming errors, all subjects were given instructions derived from the waiting technique. First they were instructed to try simply to describe, as best they could, whatever imagery they were experiencing, without trying to make sense of it and identify it in terms of known, recognisable objects. They were instructed to 'throw away' an image as soon as they had described it, and to allow new impressions to enter their minds. However, most of the subjects experienced difficulty in clearing their minds of the initial impression. If these impressions were not mentally discarded, they commonly would develop into known objects, and thus may have led to the occurance of misnaming errors.

Various strategies were developed during the introspective discussions to overcome these errors. In situations where an impression was initially unrecognisable and/or unclear, but later developed into a clear and/or identifiable image, the subjects were instructed that when judging these images they should be treated as two separate responses, which were not necessarily related. This would force the subject to pay attention to the vague/unclear response, without regard for the recognisable image which it developed into. Also, the importance of making drawings of unclear shapes during the judging was stressed. The process of drawing a form appeared to help the subjects to view the shape in a more analytic manner, without being influenced by the idea or meaning which they might otherwise have attached to it.

These instructions were not oriented towards trying to stop the subject from making mis-naming errors. Rather they were directed towards aiding the subject to recognise the possible occurrence of a mis-naming error during the judging process, and, by giving equal weight to unclear or unrecognisable imagery, to try to correct for the possible influence of a subsequent mis-naming of the image.

All the subjects tried to follow these instructions, with varying degrees of success. One, who shall be referred to as subject D, developed a strategy of almost never naming objects, as such. Rather, he would try to describe whatever he was experiencing solely in terms of its shape, or geometric components. Some examples of his mentations are: ´an upturned U shape´; ´a triangle with a line coming from all three apexes'; 'something oval, with the widest part at a right angle to the bottom, with something sticking from it.' He thereby would frequently avoid any reference to the meaning or idea of the impression. This strategy effectively eliminated any personal emotions, memories, and/or associations from his consideration of his responses during the judging procedure. The strategy was successful for subject D, as his ESP scoring was significantly above that expected by chance.

The one subject, C, who significantly psi-missed, initially had great difficulty describing his unclear imagery without reference to recognisable objects. For example, he would report: 'the vague image of a house'; 'a tree coming out of the mist'; 'two rectangular shapes together like a step'. His reaction to the instructions to try to verbalise only the shape or form of an image, without any reference to a known object, was gradually less and less to report vague imagery. Although he tried to report shape alone, he found it difficult to do so without reference to some object, such as the step in the above example, or **'the branch of a tree** in a V shape' (author's emphasis).

The other subjects' reactions fell somewhere between these two extremes. If, in a previous session, a mis-naming error had occurred which they had failed to recognise during the judging procedure, they usually would pay particular attention to their vague or unrecognisable imagery in the following session. However, this process seemed to require more effort from the subjects than simply describing an impression in terms of a familiar object. And, of course, much of the unclear imagery which was received had no obvious, or other, relation to the target. Thus they generally would tend to become lazy when next making their responses, and resume using known objects to help clarify unclear imagery.

Another potentially psi-inhibitory tendency identified involved the long following of one associative chain of thought whilst making responses. The session when the target was the golf umbrella will again be used in illustration. As noted, subject C identified the shape of a dome of a church. This image was then followed by a long sequence of events, all revolving around a church. First the church was described in detail. It was then stated that a sermon was in progress, so the clergymen and congregation were described. Finally the sermon was said to be ending, which was followed by a description of the clergymen leading the congregation out of the church and down the stairs in front of the building. The experimenter breathed a sign of relief when the subject did not then proceed to describe the surrounding neighbourhood, weather, and traffic conditions. The sequence of mentations took the subject about fifteen minutes to convey.

The above example highlights how one response could lead to a long chain of associated thoughts. This type of response sequence will be referred to as ´associative ramblings´. When subjects were involved in an associative rambling, there would be frequent pauses in the responses, during which the experimenter received the impression that the subjects were mentally ´looking around the scene´ to see what other details they had not yet mentioned. Having left a particular topic, by the reporting of unrelated imagery, subjects tended to return to the orginal associative rambling whenever there was a lull in the appearance of new impressions. The topic of these sequences varied from the relating of childhood memories, to fairy tale-like fantasies. Unfortunately, associative ramblings rarely had any connection with the target.

All the subjects tended to engage in associative ramblings during their first sessions. Two were especially prone to this, devoting almost the entire stimulus period to exploring various details of the story which they were creating. To help them overcome this tendency, subjects were instructed to question whether a string of related images was arising due to a normal associative train of thought. If the images were perceived as part of such an associative process, the subjects were to try to make their minds blank, or mentally to ask for new images to appear. However, to avoid the subjects becoming frustrated if some imagery would not go away, it was stressed that persistent trains of thought should be followed to their natural conclusion. When, with experience, they had learned that associative ramblings were not leading to target-related information, all of the subjects were able to cease this practice.

The subjects also identified two aspects of the receiving of impressions which they felt were not conducive to receiving target-related impressions. The first of these involved subjects actively trying to 'send their mind' to either the agent or the target, in an attempt to 'see' the target picture. This was attempted in a variety of ways, from mentally visualising the scene surrounding the agent and gradually trying to focus in on the target (a medical student even tried picturing himself inside the agent's head, traveling around the physiology of her visual system), to willing one's self to see the target or gain information about it, without any specific mental imagery. These attempts were often described by the subjects as frustrating, when they could not succeed in visualising the target, or if they felt the imagery which followed was unlikely to be target-related. This latter aspect involves the next area which the subjects identified as not being psi-conducive.

The subjects initially tended to disregard imagery which they believed to be derived wholly from recent personal concerns or experiences. Such recent personally-derived impressions were perceived by all as not containing target-related information. Some reported that they did not bother even to report this type of imagery. In addition, they frequently reported being frustrated by the continual appearance of such imagery.

It should be noted that the subjects had received instructions regarding these two factors prior to their first session, and were frequently reminded of the instructions during their early sessions. The instructions consisted generally of stressing the need to relax totally, and not to try to 'do' anything whilst in the ganzfeld. The subjects were told to simply let the imagery 'come to them'. They were further instructed to report **all** received impressions, regardless of how mundane or personally derived they seemed. These instructions did not include items of a very personal nature which they might not have wished the agent to hear. The subjects were instructed that if such items occurred, they were simply to make some veiled reference to them, which they would recognise during the judging procedure, but which would have no obvious meaning to anyone else.

Regarding imagery of recent personal experiences, the experimenter would give an example from a session in which she was the subject (during the previous experiment reported). In that session she kept visualising the shops she passed whilst walking home, and wondering about what she was going to buy for her supper. She quite disregarded all these impressions during the judging procedure, thinking they were due to her being hungry during the stimulus period. However, the actual target contained a picture of various shop fronts, including various food stores.

The subjects, with one exception, eventually abandoned actively trying to receive target information, and started to pay more attention to their mundane, everyday imagery. The ceasing of these ´activities´ was not due to the experimenter´s instructions; rather, the subjects had come by experience to realise that the outcome of engaging in these practices often left them feeling frustrated. This was perceived as being detrimental to the ´ganzfeld state of mind´, as it often disrupted any sense of alteration of state which they had achieved. It should be stressed that providing instructions regarding these factors did not alter or influence the subjects´ behaviour. It was not until they had come to realise, from personal experience, that these strategies were not conducive to receiving ESP-related impressions, that they were willing to abandon them.

The responses made by the subjects contained many examples of transformation errors of the three types described by Warcollier (1938, 1948/1963). An example of the occurrence of Warcollier's first error type, in which the form of the target is present but the idea or meaning is lacking, has already been presented (the golf umbrella, interpreted as a segmented, floating half circle). The significant psi-hitting of subject D, who made most of his responses without reference to the idea or meaning of his impressions, demonstrates how such references are not necessary components of target identification. In the case of subject D, the general elimination of components related to meaning appeared to be quite conducive to psi-hitting. Thus, for this subject, the idea or meaning of responses can be interpreted as conveying non-essential, and possibly even misleading, information.

Other subjects did not find the elimination of meaning to be helpful. The main reason for this concerned the difficulty of identifying form components. Whilst any given picture, and many of the responses, could be viewed solely in terms of its shape and form, often many of the same types of shapes were contained in one or more different pictures in the target pack.

The number of possible shapes contained in any given response could also be quite vast. To illustrate this the picture of the golf umbrella will again be used. This was probably the most simple, uncomplicated picture in the entire target pool. Yet its shape components could be viewed as including: an upside down U; a half-circle; a scallop-shaped line; triangles (the segments of the umbrella); lines radiating out from the centre of a circle; a straight line with a curve at one end (the handle); a hook shape (the handle); or various combinations of the above. Most pictures, and responses which relayed visual imagery, contained many more shapes than this example.

Most subjects who tried a judging strategy, based only on shape and form correspondences, were greatly frustrated by the very large number of possible correspondences which could be found between their responses and **all** of the possible target pictures. Subject D was an obvious exception to this, as was subject A. In the case of the latter, he eventually came to believe he was receiving information about all six of the pictures, due to various shape correspondences. Subject A believed himself to have psychic abilities: being able to find correspondences between his responses and every one of the six pictures in the target pack greatly reinforced his belief. However, it contributed little to the findings of this study.

For most of the subjects, determining which shapes should be related to which pictures presented an insurmountable obstacle.

In contrast to the situation where subjects tried to describe vague impressions in terms of recognisable objects, imagery occasionally was perceived which could **only** be described in terms of certain form characteristics. Such imagery was normally relatively clear and well-defined, and did not tend to transform into another more recognisable object, as did the unclear form images. In these situations, in which no meaning or idea could be attached to the form described in the responses, the subjects would try to determine which of the six possible targets appeared to be most related to the form. In most examples of this type of response only one relatively simple shape would be contained in the response. When this occurred the frustration encountered when the response could be viewed as containing many shapes, as described above, was avoided. In judging such simple form responses, the subjects found it useful to try to view the pictures in respect to the shape and form of their primary components, without consideration of the meaning of components.

Warcollier´s second category of transformation error, where both form and meaning may be incompletely transmitted, was the most frequent error source in this study. An example of this involved a target picture of Edinburgh Castle. The photograph of the Castle had been taken from below the cliffs upon which it sits. The subject described a ´cliff face, cracked and seamed´; the cliffs were described as ´in a semi-circle, around something central...like a hill, but not a peak, [like] a plateau´. The subject, B, further described the hill as being in a U shape, with the cliffs at the curved bottom of the U, and the hill decreasing in height on both sides, progressing down the sides of the U shape. He then identified a ´dark, heavy shape´ on the plateau: this was further described as a ´fort´.

Anyone familiar with Edinburgh Castle will immediately recognise the above as an accurate description of its location, and of the hill upon which it is built. Furthermore the similarities between a castle and a fort are obvious. But subject B scored a direct miss in this session, giving the target picture a ranking representing the least possible degree of correspondence. When questioned as to why such apparent correspondences were not noticed, subject B responded that the imagery received did not look like the Castle scene, with which he was quite familiar: as the subject knew the target scene so well, it was never examined in any detail during the judging procedure.

Many other illustrations of this type of mis-interpretation could be given. In the above example the subject failed to recognise the target for two reasons. The first is entirely due to the occurrence of this type of transformation error: while the idea and shape of the target were contained in the response, the representation of these differed to a great enough degree to render the target information unrecognisable. The second reason involved the subject's familiarity with the target, which made it difficult for him to evaluate the target in an objective manner.

The golf umbrella session can provide another example of the occurrence of this type of error. The subject in that session also received imagery of a 'teardrop', and later, of 'tears'. Whilst these images do not convey the meaning of rain, they do represent the idea of it. The subject reported that the possible connection between rain and tears never occurred to him, as he did not associate rain with sadness.

Also in this session, subject C made a response of ´a business man with a brolly in his case´. Here the idea of the umbrella is wholly represented. However, due to the discrepancy in appearance and size between a golf and a businessman´s umbrella, subject C placed little emphasis upon the correspondence, reporting that he had very different associations with the two type of umbrellas. He said he owned a golf umbrella, but he would never associate himself with a business man. Thus he did not view this as a particularly strong correspondence. It is interesting to note that this subject, who significantly psi-missed, had placed the umbrella in a briefcase. A typical depiction of a businessman with an umbrella would involve having the man holding a full-sized, black umbrella. Could the atypical placing of an umbrella in a briefcase represent an unconscious attempt to avoid the target?

Both of the above examples serve to illustrate one area which caused many possible target-related responses to go unnoticed. Subjects appeared to have difficulty judging objectively pictures and responses with which they had personal associations. If a response or a picture evoked a specific emotion in a subject, or if it was tied to a particular context or experience, the subjects appeared to have difficulty in judging the item, outwith the personal meaning it held for them. It should be noted that this is not meant to infer that all personal associations lead to a misinterpretation of a response. There were occasions on which personal associations helped lead the subject to make correspondences which were not noticed by the experimenter, who had no knowledge of the subject's associations. To aid subjects in overcoming possible errors derived from this factor, they were instructed always to try to consider their responses, and the pictures, both with and without reference to any personal meaning which the item might hold for them. However, the subjects had difficulty considering such items outside of their personal context, even when errors deriving from this factor were pointed out to them: this was one area in which very little learning occurred.

A final error type connected with the second category of Warcollier's transformations involved an accurate portrayal, in both shape and idea, and/or in meaning, of a relatively small or insignificant component of the target picture, which would be overlooked during the judging procedure. This was a common occurrence during the early sessions. When errors of this type arose, the importance of thoroughly examining each picture, and noting all its details, however insignificant, would be re-emphasised. The subjects readily adopted this procedure, and correspondences of this type were seldom missed in the later sessions.

The last category of transformations which could give rise to errors of misinterpretation concerned responses in which the idea or meaning of the target was present, but the form was lacking. One example of the occurrence of this error type involved a session where the target was a picture of a parrot dressed in pirate clothes (eyepatch, peg-leg, etc.). The subject received imagery of a deserted island, a beach, and surf breaking on the shore. He also mentioned childhood images of digging in the sand, and a line from a R. L. Stevenson poem about a child digging in the sand with a spade (Stevenson also wrote Treasure Island). The subject also made a response concerning problems in South African diamond mines, followed by remembering that the family of a friend owned a gold mine. Another image made was of an old-fashioned sailing ship. Thus, many images were received which related to typical 'pirate' activities (ships; and digging for treasure in sandy beaches on deserted islands). However, only the sailing ship was seen by the subject as relating to the target, and it was judged to be a weak correspondence.

Sometimes the mentation would contain no specific reference to the meaning or idea of the target, but would have conveyed some more abstract sense of it. For example, subject F once correctly identified a target on the basis of a general feeling of desolation which the target aroused in him, a feeling which he had felt conveyed to him by the imagery which he experienced. On another occasion, subject A remembered feeling during the stimulus period that he wanted to see a bird, although such imagery never occurred to him. In this session a bird was the central component of the target picture, and the subject correctly identified it on the basis of the feeling of wanting to see one.

Other examples of this error type occurred when the response contained references to the movement or activity implied in a picture. Thus a target of a train received imagery of revolving circles; and imagery of a bird in flight was made when the target pictured an aeroplane. One might also classify responses which contained references to target-related colours in this category.

The subjects experienced little difficulty in correcting for initial errors arising from overlooking movement, activity, and/or colour correspondences. However, they found it difficult to identify errors such as that described in the pirate parrot example, where the idea was indirectly conveyed, with incorrect formal representations. The importance of considering general or consensual associations was stressed as a way to overcome such transformations, but most subjects were still unable to ´see through´ such responses.

A final area which may have negatively influenced judging outcome involved subjects liking certain pictures in the target pool more than others. Not surprisingly, the subjects observed that they would pay more attention during the judging procedure to pictures for which they had a personal preference. Pictures which had no particular appeal, or those with which the subject was quite familiar and had a relatively neutral emotional response to (as in the case of the Edinburgh Castle target), tended to be overlooked. This resulted in the subjects overlooking correspondences with targets which were not of intrinsic interest to the subject. Another outcome was that preferred pictures tended to receive a higher ranking than non-preferred pictures (more correspondences were observed in preferred pictures, due to their receiving greater consideration during judging).

A similar tendency existed in relation to responses. Mentation items which the subject liked, either because they represented a pleasant association, and/or memory, or which the subject found interesting (due perhaps to the bizarre or unusual content of the response), were given greater consideration, during the judging, than were less interesting, more mundane items. This tendency would occasionally result in target-related information going unnoticed.

To aid the subjects in overcoming personal preference effects, examples of these errors, taken from their own sessions, were pointed out to them. The importance of ignoring personal preference for and/or interest in particular pictures, and responses, and of attempting to give equal consideration to all response items, and pictures, was stressed. Subjects generally tried to adhere to this judging strategy, with some success. However, as demonstrated by the Edinburgh Castle example, which occurred in subject B´s eleventh session, subjects appeared occasionally to forget the importance of this strategy.

Thus far, most of the strategies developed to aid the subjects in overcoming possible error sources have entailed their engaging in various analytical procedures. Some of these strategies proved helpful in aiding the subjects to recognise correspondences which may have otherwise gone unnoticed. But what of situations where the subject had an intuitive feeling favouring one particular target, or instances where the subject, upon initially viewing the targets, ´recognised´ one of the pictures as the target? In the vast majority of cases, reliance upon intuition or a sense of recognition proved misleading. Most subjects soon learned that such reactions to certain pictures should not be allowed to sway their judging. They realised that a careful analytical consideration of their mentations, and the pictures, was more likely to result in successful target identification than was a judgment based on personal, intuitive reactions.

Agent Observations

The primary concern of the agent, aside from the sending of the target, was to make note of any response made by the subject which appeared to be related, however remotely, to the target picture. The mentation items thus noted by the agent would be discussed with the subject, after the judging had been completed.

A secondary concern of the agent was to note what sending technique or strategy she was using when a particularily strong correspondence was elicited from the subject. She also noted instances in which the subject's response seemed specifically relevant to a thought or action in which she was engaged. It was thought that as the 72 sessions progressed, the agent might be able to identify certain strategies, or sending techniques, which appeared to coincide, more often than others, with the subject making a target-related response. It should be stressed that these observations were of secondary importance to the experimenter /agent. No effort was made to follow any specific sending 'routine'; nor were the various sending techniques varied in any systematic manner.

No specific method of sending was identified as relating to the occurrence of target-related responses. However, the agent did note that target-related responses often were made when her attention had been momentarily, and unconsciously, distracted from the sending procedure. For example, in one session the target was a large picture of an American Flag. The agent had been concentrating on the target but her mind had momentarily wandered from the task. She was looking out of the window, not thinking of anything in particular, when the subject reported: 'a square piece of material hanging from a tree...pilgrims and pilgrim fathers...a thistle [Scotland's national emblem], a Russian eagle'. This was observed to happen with such frequency that the agent started to purposefully let her mind wander away from the target, but the tactic did not prove successful. This may suggest that, if such mental wandering does correspond to the subject's making target-related responses, it has to be a genuinely unconscious act on the part of the agent.

The subjects' responses occasionally appeared to coincide temporally with the thoughts of the agent. Thus, whilst the agent was mentally picturing an eagle's eyes the subject reported 'two shrouded eyes'. In another example from the same session (in which the target was a picture of an eagle flying with outspread wings), the agent was thinking that an eagle was the national emblem of the United States, when the subject reported: 'the word "American" comes to mind'.

It should be noted that such correspondences did not always reflect upon the target. For example, on one occasion the agent looked at her watch to note the time, whereupon the subject mentioned a clock with a second hand, and embarked upon a long sequence of associative rambling. On another occasion the agent was feeling hungry, and thinking of the sausage roll she would eat when the session was over, when the subject reported an image of ′a sausage; a sausage roll, actually′. Such non-target-related correspondences did not occur with great frequency, but were common enough to encourage the agent to try to keep her attention restricted to target-related thoughts.

## §5.5 Discussion of Experiment II

The eliciting of significant above-chance overall psi scoring, as anticipated by the use in this experiment of extraverted sheep, and the ganzfeld, was not achieved. Thus, this study provides no support for regarding either the ganzfeld or extraverted sheep as psi-conducive components in ESP experimentation. However, this study contained several factors which may have possibly contributed to the lack of overall significant psi-hitting. These factors include subject selection, study design, and certain procedural problems which arose during the running of the experiment.

### Subject Selection

The subjects who participated in this study were selected on the basis of their possessing certain traits, normally thought to be psi-conducive, to a greater degree than the population average. The mean population score on the Thalbourne/Haraldsson Sheep/Goat Scale is 8+, out of a possible score of 20. The scores of the subjects who participated in this study varied from 10 to 19. Thus the subjects generally can be viewed as being extreme sheep.

Palmer (1978), reviewing the sheep/goat effect, noted a high between-subject, and low run-score, variance among extreme sheep in forced-choice studies. He had earlier suggested (Palmer, 1972) that extreme sheep produce the most reliable, and strongest, ESP scores; but that they score both above and below chance, thereby producing a cancellation effect, resulting in a low run-score variance. An alternative explanation for these variance effects is suggested by a study by Stanford (1964), who found that the scoring of extreme sheep demonstrated a within-run decline, whereas that of other subjects inclined.

In Experiment II of this thesis, the ´second least extreme´ sheep (sheep/goat score of 12) also produced the only significant psi-hitting. The three most extreme sheep (scoring between 16-19 on the sheep/goat scale) all scored in the psi-missing direction, one to a significant degree (his sheep/goat score was 17). Thus some support for Palmer´s cancellation effect can be found in this study.

In relation to Stanford´s findings, the least extreme sheep in Experiment II demonstrated a significant scoring decline across trials, while all but one of the subjects´ scores tended to decline across sessions (the subject whose scores inclined, non-significantly, had a sheep/goat score of 12). As all the subjects were extreme sheep, and most had a scoring decline across-session, the results display effects similar to those found by Stanford. However, the most extreme sheep demonstrated less of a scoring decline than the others. This is the reverse of what would be expected if scoring declines were associated with degree of sheepishness, as suggested by Stanford's findings.

Palmer (1978) also notes that the evidence that extreme sheep tend to have lower mean scores than moderate sheep is only suggestive, and that there are significant results which do not support this effect (McBain et al., 1970). Also, both Palmer and Stanford's findings were based on the results of forced-choice studies. As free-response tests present a less mundane, intrinscally more interesting task to subjects, findings based upon forced-choice tests may not equate to those of free-response studies. None the less, it is still possible that the use of extreme sheep in this study, in an attempt to maximise psi-hitting, may have been counter-productive.

Thalbourne (1981) has found that the sheep/goat effect tends to be nullifed if the subject and agent are good friends. Most of the subjects were friends of the agent and over the course of the twelve sessions a close relationship was developed with all of the subjects. This may have also contributed to the lack of significant overall scoring by sheep in this study.

Sargent (1980a, p. 95) suggests 'that "conventional" psi-influential trait-variables may be more important in terms of magnitude of effect in altered state settings than in waking-state experiments.' Certain possible explanations have been given above as to why the testing of sheep in this study may not have contributed to positive psi-scoring. Do similar findings exist in relation to extraversion? In examining extraversion/ESP correlations, Sargent (1981b) found that in free-response studies there was a significant, positive ESP/extraversion correlation in eight of the reported thirteen analyses, giving a replication rate of 61.5 per cent. In forced-choice studies, the ESP/extraversion correlation replication rate was only 22.5 per cent. Thus, it appears that free-response studies do lend themselves to ESP/extraversion correlations.

Sargent has been the only experimenter to examine the relationship of extraversion to ESP in the ganzfeld. His monograph (1980a) reported five studies which looked for ESP/extraversion correlations. Four of these studies reported finding correlations in the expected direction. However, Stanford (1981b) points out that these ESP/extraversion correlations may be confounded due to extraversion influencing subjects' judging proficiency. Stanford specifies that an extravert may be more motivated to judge carefully, may more fully utilise cues given by a subject experimenter, and may be more talkative and probing with the subject experimenter, thus eliciting more cues from him, than an introverted subject.

To what degree free-response studies, and Sargent's studies in particular, may have been influenced by extraversion/judging factors is a matter of speculation. However, Sargent (1980a) has stated that his subject experimenters take an active role in the judging process, going so far as to 'suggest mentation/picture links to subjects' (p. 98). Thus, Sargent's work certainly has the potential for having been confounded by extraversion/judging factors. Indeed, many of the errors which the subjects in Experiment II made during the judging might have been corrected for if a subject experimenter had aided them in recognising mentation-picture correspondences.

Thus, while Sargent's results do give support to a positive relationship existing between ESP scoring and extraversion in the ganzfeld, these findings may be confounded. Experiment II did not find a significant ESP/extraversion correlation. However, the most extreme extravert, with an extraversion score of 20, significantly psi-hit, where one of the two least extreme extraverts, with an extraversion score of thirteen, significantly psi-missed. But, given the lack of an overall significant ESP/extraversion correlation, and the small number of subjects tested, the findings from this study offer no real support for an ESP/extraversion relationship.

Thalbourne, Beloff, and Delanoy (1982) used the same extraversion and sheep/goat scales utilised in this study, to examine the relationship of these personality variables to ESP in two studies testing 187 undergraduates at the University of Edinburgh. The first study revealed that, as hypothesised, extraverted sheep scored higher than introverted goats, to a marginally significant degree ($p = 0.058$, one-tailed). These findings were not confirmed in the second study,due to extraverts having non-significantly lower ESP scores than introverts. However, a <u>post hoc</u> analysis disclosed that ESP scores did correlate significantly with the sheep/goat scale ($r = 0.30$, $n = 86$, $p = 0.005$, two-tailed). Thus, in this second study, testing a subject population similar to that of this study, the Eysenck Personality Inventory (EPI) did not prove to be a reliable predictor of psi. It should be noted that Sargent utilised the Cattell 16 Personality Factor Questionnaire (Cattell, Eber, and Tatsuoka, 1970) in his studies. Sargent (1980a) has also argued that Cattell´s 16 PF has a superior validity and reliability to that of the EPI. Thus, Cattell´s 16 PF may provide a better indicator of extraversion/ESP effects than the EPI.

Study Design

The ways in which the design of Experiment II differed from that of other ganzfeld experiments have been previously highlighted in Chapter 2 of this thesis. One of the factors noted there, not using a subject experimenter, has special relevance to this study. Various objections to the use of subject experimenters have been noted previously. In addition to these, there were two further reasons for not having a subject experimenter. First, no one was available to act as a subject experimenter. Secondly, the primary goal of this study was to train subjects to recognise, and learn how to correct for, various transformation errors which commonly occur in free-response data. It was felt that a subject experimenter could prove to be a confounding influence, as the subjects would try to gain information from him/her as to the correctness of their judging. Even if the subjects did learn to recognise the transformation errors, such learning might not be revealed by the data if initial scoring was inflated, due to input by the subject experimenter. There was also the possiblity that the subject experimenter could learn better judging strategies as the sessions progressed. Thus the scoring might have improved across sessions due, to some indeterminable degree, to learning on the part of the subject experimenter. Finally, as posited in Chapter 2, it is possible that the ESP of the subject experimenter would have interacted with that of the subjects, to an unkown degree. By not having a subject experimenter it was assured that any improvement which did occur would be due solely to subject learning.

Contrary to expectations, the scoring in this study tended to decline across sessions; significantly so for one subject. This could indicate that twelve sessions were too many, and the subjects were growing bored with the session procedure. Or perhaps some of them may have realised that they were scoring at chance-level, as the sessions progressed. This may have resulted in a lessening of enthusiasm and/or motivation.

All of the six subjects felt that they had displayed ESP in the study. The hopes of continuing to do so helped to keep them highly motivated. At the end of their twelve sessions four of the six subjects offered to take part in further ganzfeld experiments. Three of these were in fact eager to participate in a similar study again. It seems unlikely that subjects would volunteer for further experiments if they were not still enthusiastic about the experimental technique, and were not still motivated to do well.

The two remaining subjects, one of whom significantly psi-missed, both believed themselves to be quite psychic, prior to the start of the study. While their belief in their ability had not changed, they both felt that the ganzfeld was not conducive to their displaying their ESP ability. Thus, while lessened motivation and enthusiasm may have been a factor in two subjects, the remaining four did not appear to been so affected.

It should be noted that the experimenter also quite enjoyed conducting this study, and felt that interesting information was being obtained from it. Her enthusiasm and motivation did not diminish as the sessions progressed.

One factor which may have related to the tendency for scoring to decline could be due to the subjects' becoming experienced in the ganzfeld technique. None of the subjects had had any experience with the ganzfeld prior to the experiment. By the conclusion of the study each subject had experienced twelve ganzfeld sessions and could be classified as experienced subjects. Sargent (Exps. III, V, and VI, 1980a), Ashton et al. (1981), and Sargent et al. (1981) have tested experienced subjects, and noted various performance differences between them and naive subjects. Of particular relevance to this study are their findings relating to stimulus duration and extraversion.

Regarding stimulus duration, Sargent noted that a normal 35 minute stimulus period seemed rather long to experienced subjects. Subjects were thus allowed to end the ganzfeld stimulus when they wished in two studies (Ashton et al., 1981; and Sargent, Exp. VI, 1980a). The first of these studies (Ashton et al., 1981) revealed that experienced subjects tended to end the stimulus period prior to the usual 35 minutes. The mean stimulus duration for each of the four subjects in their experiment was between 23 and 31 minutes. The overall results of the study were significant. A highly significant correlation ($p < 0.006$) was found between stimulus duration and psi-scoring, the highest correlation being found for the subject with the shortest stimulus duration. The study suggested that experienced subjects would become more quickly habituated to ganzfeld stimulation than naive subjects, and therefore would require a shorter stimulus period. The authors concluded that a stimulus duration of around 25 to 26 minutes was optimal for experienced subjects.

Sargent Exp. VI (1980a) also allowed experienced subjects to terminate the stimulus period when they wished. His study did not obtain a significant correlation between psi scoring and session duration. Specifically to examine the duration question in greater detail, Sargent et al. (1981) compared the performance of experienced and naive subjects using both fifteen and 30 minute stimulus durations. His study yielded no significant overall ESP scoring, nor were there any observed differences between the two stimulus durations.

Thus the work examining optimal stimulus duration for experienced subjects has yielded inconsistant results. Nonetheless, if the subjects felt that the stimulus duration was too long after they had become experienced in the ganzfeld, this could have contributed to a scoring decline. However, only one subject actually said that the duration was too long. This subject, A, showed the smallest degree of decline of any of the five subjects whose scoring did so. It should also be noted that Rogo (Exp. II, 1976) observed a scoring decline with an experienced subject who participated in sessions using short, variable stimulus duration. His finding also suggested that length of stimulus duration/experienced subject factors are not necessarily connected with subject performance. Thus, there is no firm evidence to suggest that an interaction between stimulus duration and subject experience may have been a factor in the scoring decline obtained in this study.

As regards a possible experienced subject/extraversion effect, in his Exp. III Sargent (1980a), testing experienced subjects, failed to replicate the extraversion/ESP scoring effect which he had observed in his first two experiments: the correlation obtained in his third study was in the opposite direction (rs = −0.01) from the findings of his previous two. This result is particularly surprising as the subjects in his Exp. III had also participated in his Exp. I and/or Exp. II. In a later study (Sargent _et al_., 1981), a significant ESP/extraversion correlation was obtained with naive subjects experiencing 30 minutes of stimulation (rs = 0.67), but not with experienced subjects (rs = 0.18). Sargent (1980a) has drawn the tentative conclusion that while extraversion may tend to be a key variable in influencing the psi scoring of naive subjects, it does not appear to be an important influence on that of experienced subjects.

Considering Sargent´s preliminary findings in relation to the findings of Experiment II of this thesis , if extraversion tends to influence the scoring of naive subjects more than experienced ones, it should have had a stronger influence on the subjects´ initial sessions. As they became more experienced the extraversion influence may have decreased, possibly resulting in a decline in scoring. As one subject did display a significant scoring decline, and the scoring of four others tended to decline, these results may offer some tentative support for Sargent´s conclusion. However, this possibility is speculative, as more research is needed before a firm conclusion regarding an experienced subject/extraversion effect can be arrived at.

## Procedural Factors

Regarding the lack of overall significant scoring, and the *post hoc* discovery of significant scoring differences between the first and second three participants in my study, several factors relating to the running of the sessions can be identified which may have contributed to these findings. The sessions of the first three subjects (subjects A, B, and C) were interrupted for a four week period due to the Christmas holiday and academic scheduling. Thus the sessions of these subjects were spread over a fifteen week period, compared to a six week period for the last three subjects.

Furthermore, the sessions of the first three subjects were plagued by mechanical difficulties. During these 36 sessions four tape recorders, two microphones, and three sets of earphones ceased to function. It also occurred that the recordings of the subjects´ mentations would, for no obviously explicable reason, become inaudible in places on the tape. The electrical technician in the Psychology Department often could find no reasonable explanation for the equipment failure. On several occasions he was able to identify the source of the trouble, but could not understand how the specific fault had developed. Several scheduled sessions had to be cancelled at the last minute due to these failures. Also, the start of a session frequently was delayed due to equipment being replaced, or the technican hurriedly repairing some minor fault. In the sessions of the last three subjects, there were no mechanical problems.

Any possible effects that the spreading of the sessions over a longer period of time, and all the mechanical problems, might have had on the ESP scoring is a matter of pure speculation. However, it is possible that the greater length of time between sessions experienced by the first subjects may have negatively affected their scoring, with less continuity between sessions leading to not remembering various error sources identified in previous sessions. Also, the persistent mechanical failures may have had a demoralising effect on the subjects. The occasional losing, due to inaudible recordings, of parts of mentation reports, making a review of such mentations impossible, also may have detrimentally affected performance.

Another reason for the second three subjects attaining a higher degree of ESP scoring than the first three could be related to learning on behalf of the agent/experimenter. Tart's (1966) theory regarding agent learning may have been a factor, although it should be stressed that the agent was not able to identify any specific sending strategies which appeared to be more related to ESP-elicitation than others. Sargent (1980a) examined the study outcomes of five experimenters who had reported a series of ganzfeld studies (the work of Rogo was excluded, as Sargent did not feel his studies utilised a valid ganzfeld design). He found that there was no evidence of declining levels of significance for any of the experimenters, and that three, Honorton, Stanford and himself, did not obtain significant overall ESP-scoring outcomes until their second experiments. He concluded that his examination ´suggests (a) a possible "experimenter learning effect" and (b) that experimenters who have tried once to elicit overall significance in Ganzfeld psi studies and have failed to do so should, perhaps, try again!´ (1980a, p. 101).

In the present study the author was not aware of any learning as such occurring on her behalf. However, the lack of mechanical difficulties in the last 36 sessions did result in her feeling more relaxed and competent during these sessions.

## §5.6 Conclusions

The discussions between the subjects and experimenter yielded some interesting information regarding subject strategies during both the making of responses, and the judging of their responses and the target pictures. This is one area about which very little has been written in current ganzfeld research. Given the importance of the subjective experience and perspective of the subject in ganzfeld studies, this apparent lack of consideration of these factors is most surprising. White (1964) has argued in favour of greater reporting of subjective information. It is hoped that this study will contribute to a greater understanding of subjects' subjective experiences, and problems which they may encounter, in ganzfeld sessions.

The only thorough account of judging instructions published thus far is that by Palmer et al., 1979 (most experimenters provide no details as to judging instructions). The findings from Experiment II give support for the validity of Palmer's instructions. All the different types of correspondences which Palmer asked his subjects to consider; literal, formal, thematic, emotional, and symbolic, did occur in this study. It's findings, and those of Sondow's (1979), stress the importance of having subjects consider their associations with their responses, and with the target pictures. However, Experiment II disclosed that simply instructing subjects to look for these types of correspondences did not ensure that they a) would do so, and/or b) readily could do so. The findings suggest that most subjects experience some difficulty in identifying at least some of these correpondence types, and that some type of formal training, in which the subjects review mentation records and the related target pools with an experienced judge, may be helpful in aiding subjects to overcome these difficulties.

Regarding the receiving of impressions, this study demonstrates how subjects will try out various 'receiving' strategies (ie, actively trying to 'make contact' with the agent, and not mentioning mentations which they think irrelevant) regardless of instructions to the contrary. The other two main problems associated with the receiving of impressions involved the subjects trying to make sense of unrecognisable imagery, and following associative ramblings. All of these potential problems were solved by having the subject and the experimenter review the mentation reports with reference to the target picture. Training such as this might prove a valuable addition to studies which are testing naive or relatively inexperienced subjects, who have not yet been able to identify these potential 'trouble spots' through their own experience.

Another finding regarded the differences between subjects. Whilst many of the subjects experienced difficulty in the same areas, they displayed many individual differences in how they reacted to and solved (or attempted to solve) these problems. The judging strategies developed to overcome transformation errors differed markedly between subjects. What worked for one person, did not necessarily work for another. Sargent (1980a) has also observed such differences in his experienced subjects, commenting that 'with experience, different types of subjects may adopt different strategies for developing psi in Ganzfeld' (p. 95). This suggests that when working with inexperienced subjects, a general set of instructions may be of value, in making them aware of the various types of correspondences to look for. However, until they have learned, through experience, what particular judging strategies are most useful to them, such instructions may not greatly influence their judging.

## CHAPTER SIX

## EXPERIMENT III: TRAINING IN THE GANZFELD

## AN EXAMINATION OF SUBJECT AND AGENT MENTATION

### §6.1 Introduction

The use of free-response methodology in conjunction with psi-conducive states, such as the ganzfeld hypnogogic state, has done much to improve the reliability of psi scoring by unselected subjects. Most attempts to apply these paradigms to a training situation have involved a repeated-measures design, whereby the subjects are intended, through repeated experience, to learn to differentiate between psi and non-psi responses, by becoming aware of ´cues´ of which they are normally not conscious. However, for this type of learning to occur, the subjects must first be able to recognise correspondences between their experiences while in the psi-conducive state and the target material. That is, they must be able to recognise correspondences during the judging process. It has been this experimenter´s experience (in Experiments I and II) that the subjects´ ability (or lack thereof) to recognise such correspondences has been a major obstacle to their psi-learning success.

The data attained by the use of free-response methodologies may contain information which could greatly assist subjects in recognising psi-mediated responses during the judging. If certain categories or types of mentation were found to be psi-related more often than other types, this information could prove most useful to subjects trying to develop their psi ability. Yet the wealth of data from free-response studies has not yet been made full use of in this manner.

Mentation reports of course have been examined in many studies. However, these examinations have usually been confined to subjects making overall judgements about the whole of their mentation report, by means of pre- and/or post-session questionnaires. The type of information gained from such questionnaires is too global to be of any real use in a training setting. Hence, while information gathered from these questionnaires may help to identify general characteristics of mentation reports which appear to be psi-conducive, they do not provide the specific information necessary to aid subjects in the judging of their responses. Thus, while bizarre and spontaneous imagery; abundance, clarity, and ease of obtaining imagery; and auditory imagery, are all general characteristics of mentation reports which have been frequently associated with psi-hitting in the ganzfeld (Sargent, 1980a), there is no evidential basis for instructing subjects to give greater weight in their judging to these types of imagery. In order to offer such judging advice to subjects, characteristics of specific mentation items or responses would have to be found to be related to psi-hitting.

A few experiments have asked their subjects to examine each individual mentation item for certain characteristics. Sargent, Barlet, and Moss (1982) asked their subjects to check through their mentation reports and make note of any items which seemed particularly clear or strong, and of surprising or unusual items. The unusual items showed higher scoring than non-unusual responses, particularly in naive subjects, but the difference was not significant. However, the analysis was confounded by the discovery that several experienced subjects did not bother to report their more mundane mentations, even though they had received instructions to do so. This resulted in the mentation reports of the experienced subjects being biased towards unusual items. With regard to clarity, naive subjects scored significantly better when imagery was unclear, rather than clear ($n = 12$, $t = 2.67$, $p < 0.02$, two-tailed). Experienced subjects demonstrated the opposite; that significantly more of their clear imagery contained target-related information than would be expected by chance ($n = 15$, $t = 2.44$, $p < 0.05$, two-tailed). A further analysis showed that while naive and experienced subjects tended to score in a similar manner with unclear imagery, their clear imagery ESP scoring differed significantly ($n = 27$, $t = 2.52$, $p < 0.02$, two-tailed), with clear images appearing to mediate psi-missing for naive, and psi-hitting for experienced subjects.

Milton (1984), using a method of examining mentations similar to that of Sargent _et al_., found a significant relationship between surprising imagery and psi-hitting (Wilcoxon's test method: $n = 21$, $T = 57$, $p < 0.05$, two-tailed). In a later experiment Milton (1985a) discovered that fleeting imagery related significantly to psi-missing ($n = 17$, $T = 26$, $p < 0.02$, two-tailed). These experiments have started to examine mentation imagery in a way which may provide useful insights, relevant to the training of subjects to improve their ESP-scoring.

The study reported in this chapter (Experiment III) examined fifteen different types of mentations (eg, bizarre, fleeting, and auditory imagery) to determine if any response type related significantly to psi-hitting. If certain mentation types, relating significantly to successful ESP scoring, can be identified, subjects could then be instructed to give greater emphasis to such responses during the judging procedure. Thus if, for example, auditory imagery was found to relate significantly to psi-hitting, subjects could be instructed to pay particular attention to such imagery during judging. This could be a valuable aid to subjects, by helping them to identify and differentiate psi- from non-psi-mediated responses.

Another area of inquiry which could provide help to subjects in their judging involves the importance of weak and strong correspondences. As discussed in Chapter 5, few experimenters have presented details of subjects´ judging instructions. Two exceptions to this are Palmer et al. (1979) and Sargent (1980a). Both of these studies´ judging instructions stressed the need to differentiate between responses, according to the apparent strength of the observed correspondence. Whilst it may seem to be common sense to give greater weight to apparently better correspondences, this author is unaware of any work having been done which justifies this conclusion. The fact that the ESP content of responses often appears to be transformed to a potentially unrecognisable degree, has been discussed at length in Chapters 3 and 5. If, due to transformations, the ESP content of a response is 'masked', potentially 'strong' correspondences may not be recognised as such. This argues against the procedure of automatically giving great judging weight to apparently strong correspondences. The third study for this thesis examined weak and strong correspondences, to see if one was more related to psi-hitting than the other.

The role of the agent could also be of importance in ESP training studies. While the majority of ESP experiments use an agent, little attention has been given to the training or instruction of agents in how to perform their sending. This is perhaps not surprising, as the data concerning the benefit of even having an agent in ESP experiments has been conflicting (see Palmer, 1978). White (1976) presents an excellent review of the relatively sketchy data addressing the role of the agent, to which the interested reader is referred.

One way in which the agent may be able to learn how to achieve an improvement in his or her method of sending is Tart's (1966) immediate feedback method (see Chapter 3 for a description of this technique). This author has not found in the literature any test of Tart's hypothesis that immediate feedback could develop an agent's sending ability. The first two studies conducted for this thesis, in which immediate feedback was received by the agent, provided no evidence that agent learning had occurred, although neither study conducted a systematic examination for agent learning effects. Some relatively consistent findings regarding the agent's influence on a receiver have been made, however. In Experiment II, where the agent heard the subjects' mentations as they were being made, it was noted that particularly striking target-related imagery would often occur when the agent's attention was temporarily distracted from the target picture. Similar findings indicating that the best tranmission occurs when the agent is not actively concentrating on the target have been made by others (eg, Warcollier, 1938; Van de Castle, 1970; Roll, 1976).

Harley and Good (1981) examined the effect of the agent upon the percipient's quality of experience during ESP trials, comparing performance in GESP and clairvoyance ganzfeld sessions. These authors found that in the clairvoyant condition mentation was less structured and rational, and that visual imagery was less effortful, than in the GESP condition. A similar ganzfeld study comparing GESP and clairvoyant conditions, by Sargent, Milton, Payne, and Bennet (1982), yielded a post hoc finding that subjects experienced a greater percentage of mentation items as 'bizarre' in the clairvoyance than in the GESP condition. These results are consistent with the conclusion of Harley and Good; that the agent might impose a rational structure on the subject's responses which would otherwise be lacking.

Milton (1985a) compared the effects of two different agent strategies, 'hoping', and 'experiencing', on subjects' quality of experience. She found more unstructured, dreamlike thought in the 'hoping' than in the 'experiencing' condition. While this difference was not significant (binomial $p = 0.73$, one-tailed), Milton interpreted it as lending some support to the findings of Harley and Good and Sargent et. al.; that subjects' mentations were more structured and rational under GESP than clairvoyance conditions. Milton further suggested that 'the effect upon the structuredness of the percipient's thinking is not dependent simply on the agent's presence or absence but on the agent's way of thinking' (Milton, 1985a; from the full paper presented to the 1984 Parapsychological Association Convention).

If, as is suggested by the findings noted above, the way in which an agent sends a target can influence the subject's reception of ESP, then further investigation of agent strategies is needed. If particular 'sending modes' can be related to successful ESP reception, then the training of agents could become of paramount importance. To investigate such a possibility Experiment III examined 25 different kinds of agent activity. The objective was to try to determine whether certain agent sending activities (agent mentations) appeared to be more related to the mediation of target-related responses, on the part of the subject, than were others.

Experiment II had demonstrated that subjects tended to engage in certain activities when making mentational responses which appeared to be counter-productive to the successful receiving of target-related imagery. That study also identified various difficulties which subjects had had in recognising correspondences between their responses and the target picture.

Various judging strategies were developed to try to help subjects overcome the above difficulties. The findings of the study suggested that simply giving the subjects instructions regarding the best way to receive target-related imagery during the stimulus period, and providing them with instructions as to how to best perform the judging, would not ensure that they actually followed the advice given. This experimenter concluded that training which provided actual experience of judging might be more effective in aiding subjects to overcome the difficulties experienced by the subjects in Experiment II, than is simply providing a list of instructions. Thus, for Experiment III all subjects received training in which they reviewed actual mentation reports, with the relevant target pool, before participating in any ganzfeld sessions.

The findings of Experiment II suggested that subjects sometimes would, when the agent unconsciously and momentarily turned her attention away from the target, make responses which appeared to have a high degree of correspondence to the target. It was also found that on some occasions the thoughts of the agent, which had wandered from and were not concerned with the target, seemed to be immediately perceived by the subject. These observations suggest a time-linked correspondence between agent activity and subject response.

Other experimenters have commented on the amount of apparently target-related mentations received, in relation to when during the ganzfeld stimulus period the target was being sent. Honorton and Harper (1974) observed that more target-related responses appeared to be made at times other than the actual sending period. Rogo

(Exp. I, 1976) observed an opposite trend, believing that most target-related information was received whilst the target was actually being sent. Palmer _et al_. (1977) observed more psi-hitting when the sending period was at the beginning of the stimulus period. These observations were all _post hoc_, and informal in nature. However, they do raise an interesting, and potentially important, question regarding the temporal relationship between the agent's activity and the subjects' responses.

In order to examine whether certain types of agent sending related to target-related responses as described above, the agent in Experiment III made a mentation report of all her on-going thoughts, experiences, emotions, and sensations during the sending period. The experimenter believed that, by having mentation reports from both subject and agent, an excellent opportunity existed to informally examine for temporal correspondences between the two reports. The agent's and subjects' mentation reports therefore were temporally matched, in the hope that some further observations regarding the temporal relationship between the subjects' responses and the agent's activity might be forthcoming. The method for accomplishing this comparison of mentations was to be relatively crude, and no firm conclusions were intended to be drawn from it. However, it was felt that it might provide information which could suggest ideas worthy of future systematic research.

Experiments I and II of this thesis based their results on the subjects' judging. Independent judges were not used, due to the lack of necessary resources, such as financing to allow transcription of mentations by someone not otherwise connected with the study, or availability of skilled judges to perform the judging. In Experiment III such obstacles were overcome, allowing the data to be independently judged.

The use of independent judges in ganzfeld studies was briefly reviewed in the previous chapter. In the three years since Experiment II was conducted, seven ganzfeld studies have been conducted using independent judges (Braud, Shafer, & Mulgrew, Expts. I & II, 1983; Sargent & Harley, 1982; Roney-Dougal, 1982; Sargent, Bartlet, & Moss, 1982; Sondow <u>et al</u>., 1982; Milton, 1985a). Of these, only Sargent, Bartlet, & Moss (1982) have presented a comparison between judging outcomes of subject and independent judges. The overall results, analysed by means of a sum of ranks, reached significance ($p = 0.017$, one-tailed) when based on the subjects' judging, but not when based on the scoring of the independent judges. In that study the subjects thus proved more able to detect target-related correspondences than did the independent judges.

Similar ganzfeld findings, where the subjects' scoring obtained a greater degree of psi-hitting, or a lesser degree of psi-missing than did that of the independent judges, have been reported by Sondow (1979), Child and Levi (1980), and Palmer <u>et al</u>., (1977). This could indicate that the subject has a greater source of information available to him than does the independent judge (<u>eg</u>, subjective knowledge of his experience in the ganzfeld, and of his personal associations with his reponses and the target pictures), and hence is better able to recognise response/target correspondences.

However, Experiment II of this thesis demonstrated how a subject´s subjective experiences may at times interfer with the recognition of apparently target-related correspondences. In that study subjects experienced difficulty in separating their personal associations with the target, and/or with their responses, from the target´s objective components. Due to this, these subjects sometimes missed correspondences which may have been more obvious to an outsider, having a less emotional, more analytical, judging perspective.

One study (Palmer et al., 1979) obtained results which suggested that the independent judges were able to better detect mentation-target correspondences than were the subjects. In that study, the results from the subjects were in the psi-missing direction, whereas the results from the independent judges nearly obtained a significant level of psi-hitting. The judges in the study were two research assistants who, one assumes, were familiar with parapsychological research, and may thus have had greater judging experience than some of the persons employed as independent judges in other studies. It may be that the level of success of independent judges depends upon their skill and experience in judging free-response data. However, as few studies provide details as to the independent judges´ training in, or prior experience of, free-response judging, no conclusion can yet be made regarding this point.

Experiment III of this thesis was independently judged by a person with considerable experience of ganzfeld experimentation and judging. No prediction was made regarding whether the results based on the independent judge or the subjects´ judging would disclose the greater degree of ESP-scoring. However, as the subjects would be receiving training on how to best perform the judging task, it was anticipated that their results would be comparable to those of the independent judge.

Many ganzfeld studies have used questionnaires to try to correlate various characteristics of the subjects´ experiences of the ganzfeld, and their attitudes to the task, to their ESP performance. These were not used in Experiments I and II as, due to the multi-session design of those studies, it was feared that the repetitious completion of such questionnaires would prove a boring and mundane task to the subjects, and therefore might adversely affect their motivation. Questionnaires were used in Experiment III, as, with subjects experiencing only two ganzfeld sessions each, the previous objection to their use was removed.

Thus, this exploratory study was designed to investigate further the relationship of specific ´types´ of subject and agent mentation to psi-scoring using the ganzfeld technique. A related area of enquiry was whether weak or strong correspondences between mentation imagery and the target picture best conveyed psi-related impressions. The study also utilised conventional pre- and post-session questionnaires (Sargent, 1980), for both the subject and the agent. The subjects also gave confidence ratings for their judging, which would be examined for improvement in accuracy across the two sessions, and could be compared to those of the independent judge. Prior to the testing sessions, each subject attended a training session designed to improve his judging ability. It was hoped that this would enable subjects´ judging abilities to compare favourably with that of the independent judge.

Planned Analyses

As this was an exploratory study, no predictions were made. All planned analyses were two-tailed. They were:

1. a) A sum of ranks (Solfvin et al., 1978), based on the subject´s target rankings, was the primary overall psi measure. This is the analysis which should represent Experiment III´s outcome for purposes of line of reseach evaluation.

   b. The subjects´ rankings between their first and second session were compared, using the method given by Solfvin et al., 1978.

   c. The independent judge´s data, analysed by a sum of ranks, was compared to that of the subjects´, using the same method as in analysis 1.b.

2. The results were also examined to determine whether weak or strong correspondences best identified the target. This was analysed by means of a sum of ranks. The ranking of the targets was determined by the rating points assigned by the subject to each target for each item of mentation. Weak correspondences were considered to be those receiving ratings

of two or less, and strong correspondences were those receiving ratings of three to five.

3. The subject's psi scoring was examined in relation to the mentation categories both: a) overall; and, b) session by session. A proportions test was used, to compare the proportion of item-by-item correspondence rating points assigned to the target within each mentation category, to the experimental baseline. The experimental baseline was the percentage of all the item-by-item correspondence rating points assigned to the target.
4. The agent's mentation categories were examined in relation to the subject's target ratings as in analysis 3a.
5. Histograms were used to see whether the frequency of each mentation category varied from: a) subject to subject; and, b) within subjects (from session one to session two).
6. The ratings from the questionnaires were correlated with the Z-scores (Stanford & Mayer, 1974) of the confidence ratings, using Spearman rank order correlation tests.
7. The confidence ratings made by the subjects to the actual targets were examined, overall, and for the two sessions of each subject, by means of a one-way anova.
8. The confidence ratings made by the subjects were examined by means of independent t-tests, comparing correct and incorrect target ratings to see if: a) were the subjects more confident when they were right than when they were wrong overall; and, b) did a subject's confidence ratings improve in accuracy across

sessions.

9. The subjects' and the independent judge's confidence ratings were compared to see whose ratings showed greater accuracy, using an independent t-test to determine whether the independent judge was more confident when she was right than when she was wrong (as in analysis 8a).

10. A Spearman correlation test was used to examine the subjects' data to see whether there was a correlation between the confidence ratings and the liking ratings.

11. If there was a significant correlation in analysis 9, further Spearman correlation tests would examine whether the subjects' liking ratings corresponded to the confidence ratings of the independent judge. (In a similar analysis, the independent judge found no correlation between her confidence and liking ratings.)

12. A non-statistical, descriptive analysis examined whether the agent's and the subjects' mentation reports showed evidence of concurrent or otherwise time-matched correspondences.

## §6.2 Method

### Subjects

Twenty subjects, ten males and ten females, ranging in age from 19 to 48, took part in this experiment. Ten of the subjects were studying for an undergraduate degree. Excepting one, the rest of the subjects already had at least one university degree. The majority of the subjects learned about the experiment from attending parapsychology seminars which are regularly presented by the Parapsychology Laboratory at the University of Edinburgh. Other subjects were friends of the experimenter, or friends of other subjects, who had expressed an interest in taking part in an ESP experiment. Each subject participated in one training session and two ganzfeld sessions. The agent for all sessions was the experimenter. Prior to recruitment, all potential subjects were told about the nature of the experiment, and the general ganzfeld procedure was explained to them.

Targets and Target Selection

Twenty target sets, each containing four pictures, were used in the study. The pictures were composed primarily of postcard-sized art prints and photographs, and contained no images which would have an obviously adverse or erotic impact on the subject. Duplicate target sets were compiled for the subject and agent, with each picture being enclosed in a separate envelope for the agent's set, so that the designated target could be removed without the other pictures being viewed.

The target designation for each session was randomly determined by means of random number tables by a person not otherwise connected with the experiment. The target set to be used in each session was chosen using random number tables by a second person who was otherwise not involved in the study. Selection of target sets was quasi-random, allowing at least fifteen sessions to take place before any one target set was used for a second time. This was to prevent the agent from becoming overly familiar with the contents of any set, by seeing the same set twice in close succession. No subject was presented with the same target set more than once.

All target and target set designations were placed in individually sealed envelopes, labelled by trial number. Separate lists of the target and target set designations were kept by the people who performed the randomisation, to prevent any tampering with the original random ordering. All target sets, and the target and target set designations, were kept in a locked box to which the experimenter had the only key.

Setting

The experiment was conducted in three rooms in the Psychology Department of the University of Edinburgh. The Parapsychology Laboratory was again the main room used during the experiment. The same small room connected to the lab as was used in the first two studies was used for the ganzfeld stimulus period. There was no access to the ganzfeld room except via the lab. The agent´s sending room was located on a different corridor, on a different level of the building, sensorily isolated from the lab and ganzfeld room.

Apparatus

Four reel to reel tape recorders were used. One, located in the ganzfeld stimulus room, relayed the white noise via headphones to the subject. Another, located in the room where the judging took place, recorded the subject´s mentations. The third tape recorder was located in the agent´s sending room and recorded the agent´s mentations. The fourth recorder, located in the judging room, and connected to both the subject's and the agent's mentation recorders, played a talking clock. The talking clock reported the time at five second intervals, progressing from zero to forty minutes. The recorders used to record the subjects', and agent's, mentations were both two track. Whilst one track was recording mentations, the second track recorded the talking clock, which was playing on the fourth recorder. This enabled the subject's and agent's mentations to be matched to each other at any given point, within a maximum discrepancy of five seconds.

A switch in the stimulus room, located within easy reach of the reclining chair, could sound a buzzer in the sending room. This buzzer was used to summon the experimenter if any difficulty arose during the session, and to signal the experimenter when the subject had completed the judging procedure. Unknown to the subject there was another buzzer, which would sound in the sending room if the drawer containing the subject's target set was opened. The purpose of this was twofold: first, it was a precaution against the subject removing himself from the ganzfeld prior to the end of the stimulus period to illicitly look at the target set. Secondly, it informed the experimenter of when the subject was starting the judging procedure.

Training Session

Prior to the actual testing sessions, each subject participated in a group training session. The sessions were presented as seminars, and did not provide the subjects with any direct experience of the ganzfeld. These training sessions varied in size from 10 to 3 subjects, and were all presented by the experimenter. The training sessions' primary purpose was to familiarise the subjects with the ganzfeld procedure, and to help them overcome various problems which the subjects in Experiment II had experienced.

The problems encountered by the subjects in Experiment II involved both the receiving of impressions during the stimulus period, and the subsequent judging of the target set. During the training session these problems were discussed, and examples of their occurrence and their subsequent negative effect on psi-scoring were presented. To help the subjects with the judging process, three mentation records, from past sessions in which the experimenter had been the subject, were reviewed in detail, along with their appropiate target sets. The three mentation reports were selected to highlight the various types of correspondence which may occur. The subjects were also instructed how to rate their correspondences, using a mentation item-by-item rating scale of 0 to 5 points for each picture in the target set. They were also given a brief summary of the main points covered in the training session, to review prior to their test sessions (see Appendix 6).

The training session was also used to familarise the subjects with the various imagery categories which they would be using to catalogue their mentations. Fifteen different categories of mentations were examined. These were grouped together in such a way as to make them easier for the subject to deal with. The categories, divided into their general groups, were:

Type of Image: the image

1. interrupted an ongoing chain of thought;
2. was the result of one image transforming into another;
3. developed into a recognisable one from an unclear one;
4. appeared spontaneously.

Duration: the image was

5. fleeting;
6. persistent;
7. recurrent.

Clarity: the image was

8. undeveloped;
9. detailed;
10. had intense colour.

Content: the image was

11. bizarre;
12. related to a personal memory or experience.

Miscellaneous:

13. there was an auditory component;
14. an impression of a sensation occurred;
15. the subject experienced an actual physical reaction to an image.

The subjects were provided with a list of these mentation categories also, to review before their test sessions (see Appendix 7).

Ganzfeld Sessions

Upon arrival at the lab the subject was greeted by the experimenter and offered refreshments. The experimenter would then converse casually with the subject, during which time the procedure for the session would be reviewed. When the subject indicated that he was ready to begin the session, he was given a short pre-session questionnaire to complete. All the questionnaires used in this study were appreviated versions of those used by Sargent (1980; see appendix 8 for examples of the questionnaires).

The subject and experimenter would then proceed to the ganzfeld room, where the subject was seated in a reclining chair. Halved ping pong balls, surrounded by cotton wool to eliminate any gaps, were affixed by means of surgical tape over the subject's eyes. A red light was shone onto the subject's face from a distance of approximately 1 to 2 1/2 feet, depending upon the subject's preference, and white noise was relayed to him via headphones. The volume and tone of the white noise were adjusted to the subject's preference. When the subject was ready, the experimenter would start the white noise tape and leave the room, returning to the lab.

The design of this experiment differed from most ganzfeld procedures, in that there was no subject experimenter. Instead, the subject's mentations were recorded, by means of a microphone suspended over the reclining chair, onto the subject's mentation tape recorder. If the need arose, the subject could contact the experimenter at any time by means of the buzzer located in the stimulus room, within easy reach of the subject.

Immediately upon leaving the stimulus room the experimenter would turn on the subject's mentational tape recorder and the recorder which played the talking clock, both located on the table in the lab where the subject would perform the judging. Up to this point the agent was unaware of the identity of either the target set or the target picture for the session. She now unlocked the box, in the lab, in which the target materials were kept, and opened the envelope which contained the designation as to which target set was to be used for the session. Removing the designated subject and agent target sets and the envelope containing the target number for the session, the experimenter would then relock the box. The envelope containing the subject´s target set would be placed in the drawer which was rigged with the alarm buzzer. The experimenter would then leave the lab, taking with her the agent´s target pack, the as-yet unopened envelope containing the target designation, and the subject´s pre-session questionnaire. The door of the lab was then locked, to prevent anyone from entering it whilst the subject was in the ganzfeld.

The agent then proceeded to the agent´s sending room. There she would first complete the agent´s pre-session questionnaire, and then turn on the tape recorder which would be used to record her mentations. The volume would be adjusted to enable her to hear the talking clock which was recording on both her and the subject´s mentation tapes. (The volume of the talking clock on the subject´s mentation tape recorder was turned off, so that he would not hear the clock when he was listening to his mentation tape.)

The agent then busied herself with other things, until the talking clock announced 14 minutes. (The time announced by the talking clock corresponded to how long the subject had already been in the ganzfeld.) The envelope containing the target designation was then opened, and the envelope containing the appropriate target was removed from the target set. When the clock announced 15 minutes its sound was turned off, and the agent would remove the target from its envelope and commence sending.

The agent would send the target for 15 minutes. During this period, she would say out loud all of her thoughts, imagery, feelings, and activities. At the end of the sending period, she would replace the target in its envelopes, and relax until the subject's stimulus period had ended.

The subject received ganzfeld stimulation for 37 minutes. At the end of the period there was a one minute pause in the white noise recording, during which time nothing was heard by the subject. Following the pause, a message played which informed the subject that the stimulus period was over. The message instructed the subject to remove himself from the ganzfeld and proceed to the judging procedure. On the judging table in the lab, he would find instructions to aid him during the judging (these instructions are reproduced in Appendix 6).

After helping himself to more refreshments, the subject would complete the post-session questionnaire. He then removed the target set from the drawer and was instructed to study the pictures as taught in the training session (see Appendix 6). He would then rewind the tape upon which his mentations were recorded and replay his mentations, writing each item of mentation onto the judging sheet. He had been instructed to stop the tape recorder after entering each mentation item and finish the judging for that particular item, before progressing to the next.

For each mentation item, the subject was to place a tick in any of the imagery categories which applied to it. He was free to tick as many or as few (or none) of the categories as he felt appropriate for each item. He was then to rate the item's correspondence to each of the four pictures in the target set, using a 0-5 point scale. After having judged all of his mentation report in the above manner, he totalled the points allocated to each target, and rank-ordered the target pictures accordingly.

Lastly, he would rate the target pictures, using a 1 to 99 scale, according to his personal liking for each picture. He would also make a confidence rating (0 to 99 scale) which reflected how confident he was about the correctness of his target ranking. Most subjects took between one to two and a half hours to complete the judging. When finished, the subject summoned the experimenter by means of the buzzer in the stimulus room.

Once the subject had finished his ganzfeld stimulus period, the agent would complete the agent's post-session questionnaire. She would then rewind the tape containing her mentations, and proceed to write down each mentation item, and the time at which it was made (as conveyed by the talking clock), on to a judging form similar to that for the subject. The agent would also catalogue each mentation item, in accordance with 24 different agent mentation categories (see Appendix 9).

Having completed the mentation categorisation, the agent remained in the sending room until summoned by the subject. On two occasions subjects contacted the agent by sounding the buzzer before she had completed the judging of her mentation reports. These two sessions were not included in any analyses, due to possible contamination, as the agent would have been aware of the subject's target ranking, prior to having completed her judging. When the buzzer rang notifying the agent that the subject had completed his judging she would return to the lab, where she would give feedback as to the identity of the actual target, and generally discuss the session with the subject.

Independent Judging

The data from this experiment was independently judged by Julie Milton (Milton, 1985b). Ms. Milton has had considerable experience with the ganzfeld, as an experimenter, subject, and an independent judge. The judge made transcripts of all the sessions from the subject's mentation tape, noting the time at which each mentation item had been made, as indicated by the talking clock. She received no feedback as to the actual target for each session until she had completed the judging of all of the sessions. The independent judge performed a judging procedure similar to that of the subject. She rated each item of mentation to each of the five pictures using the same rating scale as the subjects. She also examined various mentation categories and types of correspondence. The judge gave confidence ratings for each ranking, and made liking ratings for each picture.

Three experimental sessions were not judged by Ms. Milton. For two of these she was the subject, and the third was not judged as she received information regarding the target before the judging was completed. For greater detail regarding the independent judging procedure see Milton (1985b).

## §6.3 Results

All analyses and given probabilities are two-tailed.

1. a) The subjects' overall ESP scoring did not differ from chance expectancy as measured by a sum of ranks (MCE sum of ranks = 100, obtained sum of ranks = 102, z = -0.21, corrected for continuity).

b) Nor was there any significant difference in the sum of ranks between session one and session two (MCE sum of ranks = 50, obtained sum of ranks for: session one = 50; session two = 52: session one, z = 0.00; session two, z = -0.30).

c) The sum of ranks based on the independent judge's data also was non-significant (MCE sum of ranks = 92.5, obtained sum of ranks = 81, z = 1.62); nor did her results differ significantly from the subjects' (z = 0.11). The distribution of the subjects' and independent judge's target ranks is shown in Table 6.1.

Table 6.1: Target Rank Distribution of the Subjects and Independent Judge

| Subjects | Target Rank | | | | Ind. Judge | Target Rank | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | | 1 | 2 | 3 | 4 |
| Session 1 | 5 | 5 | 5 | 5 | Session 1 | 6 | 7 | 2 | 3 |
| Session 2 | 5 | 3 | 7 | 5 | Session 2 | 7 | 3 | 6 | 3 |
| Overall | 10 | 8 | 12 | 10 | Overall | 13 | 10 | 8 | 6 |

2. For this analysis the data was re-ranked according to the degree of correspondence between the individual mentation items and the target, in order to examine whether weak or strong correspondences best conveyed target-related information (weak correspondences were those which received a correspondence rating of two or less, and strong correspondences were those which received a rating of three to five). Two sum of ranks analyses were then conducted, based on the new ranks obtained from the data. Neither weak nor strong correspondences obtained significant results (MCE sum of ranks = 100: weak correspondences: sum of ranks = 105, $z = -0.64$; strong correspondences: sum of ranks = 98, $z = 0.21$); nor was the difference between weak and strong correspondences significant ($z = -0.30$). Thus, in this study neither weak nor strong correspondences conveyed a significant degree of target-related information, nor did one convey a significantly greater amount of target-related imagery than did the other.

3. a)[1] These analyses were conducted in the hope of identifying certain response types, as defined by various characteristics, which

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1. This experiment was submitted for presentation at the 1985 Parapsychology Association Convention: it was rejected due to questions regarding some of the statistical procedures. The use of a proportions test in analyses 3 and 4 was viewed as inappropriate, as the analysis units (individual mentation items) were not independent from each other. Thus, the use of a proportions test was abandoned, and the data were examined by the following method: the proportion of all points (the correspondence rating points given for each mentation item by the subjects) allocated to the target (MCE = 25 percent) on the basis of each imagery category, were compared to the proportion allocated

conveyed target-related information more frequently than other types of responses. Such information could prove a valuable aid to subjects during the judging procedure. Overall, 25.6 per cent of all item-by-item rating points were assigned to the target (MCE = 25 per cent). Fifteen different mentation types (or response characteristics) were examined, in the manner described above, using the Wilcoxon test. The results are given in Table 6.2. Of the fifteen categories, one did not provide enough data to allow computation (this category was when the imagery prompted a physical reaction in the subject). None of the fourteen remaining categories were shown to convey a significantly greater proportion of target-related information than the others.

4. These analyses (the footnote on the previous page also applies to these analyses) were conducted in the same manner as those of analysis 3, to examine whether certain types of agent activity (sending characteristics) could be identified as particularly corresponding to the subject making target-related responses. To

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to the target on the basis of the remaining imagery for each trial, using the Wilcoxon matched-pairs signed-ranks test (Siegel, 1956). In finding an appropriate method with which to analyse this data, thanks must be extended to Ephraim Schechter, Donald McCarthy, George Hansen, Jessica Utts, and Julie Milton, without whose help and advice the following analyses would not have been possible. The discovery of an appropriate test was a time-consuming, international effort on the part of those acknowledged above. The method employed was only recently decided upon and there has not yet been time to compute the analysis on a session to session basis (analyses 3.b.). Thus, while these analyses will be made in the future, they are not reported here.

accomplish this, the agent's mentations were time-matched to those of the subject so that any response made by the subject was matched within a five second interval, to a mentation of the agent.

Table 6.2 Results from the Subjects' Judging Comparing Mentation Characteristics Using a Wilcoxon Test

| Mentation Type | N | T | p |
|---|---|---|---|
| 1. Imagery interrupted on-going thoughts | 18 | 66 | n.s. |
| 2. Image transformed from another image | 26 | 162 | n.s. |
| 3. Image developed from unclear imagery | 20 | 103 | n.s. |
| 4. Imagery appeared spontaneously | 33 | 258 | n.s. |
| 5. Imagery was fleeting | 31 | 246 | n.s. |
| 6. Imagery was persistent | 30 | 229 | n.s. |
| 7. Imagery was recurrent | 30 | 183 | n.s. |
| 8. Imagery was undeveloped, vague | 29 | 193 | n.s. |
| 9. Imagery was detailed, clear | 34 | 232 | n.s. |
| 10. Imagery was intensely coloured | 25 | 138 | n.s. |
| 11. Imagery was bizarre | 19 | 95 | n.s. |
| 12. Imagery related to a personal memory | 28 | 192 | n.s. |
| 13. Auditory imagery was experienced | 14 | 35 | n.s. |
| 14. Imagery suggested a physical sensation | 19 | 79 | n.s. |
| 15. Imagery prompted a physical reaction | 5 | 6 | ---* |

* There was insufficient data to compute this analysis.

If the subject made a response at a time where there was no corresponding mentation from the agent, the subject's response was categorised under the agent's mentation category of 'blankly' looking at the target (this category referred to those instances when the agent was thinking of nothing in particular, and just blankly looking at the target; during such periods the agent would not be making mentations). If the agent made a mentation at a time when there was no corresponding subject mentation, the agent´s mentation item was discarded. The correspondence rating points alloted by the subject to the target picture could thus be assigned to the appropriate time-matched agent mentation. The proportion of all rating points allocated to the target on the basis of each agent mentation category was then compared, by means of a Wilcoxon test, to the proportion of points allocated to the target on the basis of all the remaining imagery for each trial.

Overall, 26.3 per cent of item-by-item correspondence rating points were assigned to the target, based on the agent´s mentation report. Of the 25 agent mentation categories, six did not have enough data to allow analysis. Of the remaining eighteen categories, four were found which corresponded to the subject making target-related responses to a significantly greater degree than the other characteristics. The four categories were:

a) when the agent was concentrating on actively sending to the subject ($n = 30$, $T = 118$, $p < 0.02$);

b) when the agent was experiencing mental imagery ($n = 33$, $T = 118$, $p < 0.005$);

c. when the colour of an object was particularly noticed by the agent ($n = 28$, $T = 115$, $p < 0.05$); and,

d. when the agent experienced a vague and/or unclear mental image or thought ($n = 7$, $T = 0$, $p < 0.02$).

The results of the analyses of all the agent categories are presented in Table 6.3.

These analyses are based on the same data as those of analyses

3 (ie, the subjects' correspondence ratings). Hence, in these two analyses 40 separate tests have been conducted on the same

Table 6.3: Results Comparing Agent Mentation Categories, Using the Wilcoxon Test

| Mentation Characteristic | N | T | p* |
|---|---|---|---|
| 1. Blankly looking at target | 30 | 232 | n.s. |
| 2. Actively sending target | 30 | 118 | 0.02 |
| 3. Visually looking at target | 33 | 215 | n.s. |
| 4. Experiencing mental imagery | 32 | 113 | 0.005 |
| 5. Thinking about target (vs. imagery | 29 | 143 | n.s. |
| 6. Concentrating on a detail of target | 32 | 707.5 | n.s. |
| 7. Viewing target as a whole | 33 | 188 | n.s. |
| 8. Making general associations | 30 | 147 | n.s. |
| 9. Making personal associations | 13 | 31 | n.s. |
| 10. Mentation was not target-related | 27 | 181 | n.s. |
| 11. Concentrating on shape(s) | 27 | 172 | n.s. |
| 12. Concentrating on colour | 28 | 115 | 0.05 |
| 13. Agent experiencing emotion | 16 | 60 | n.s. |
| 14. Conveying a sense of motion | 4 | ---** | --- |
| 15. Mentation had auditory component | 17 | 75 | n.s. |
| 16. Mentation conveyed a sensation | 3 | --- | --- |
| 17. Agent physically experienced item | 19 | 85 | n.s. |
| 18. Mentation experienced fleetingly | 4 | --- | --- |
| 19. Mentation persisted in agent's mind | 8 | 10 | n.s. |
| 20. A recurrent mentation item | 24 | 143 | n.s. |
| 21. Very clear mental image or thought | 7 | 11 | n.s. |
| 22. Vague, unclear mental image or thought | 7 | 0 | 0.02 |
| 23. Spontaneously occurring mentation | 0 | --- | --- |
| 24. Mentation interrupted on-going thoughts | 3 | --- | --- |
| 25. A bizarre mental image or thought | 1 | --- | --- |

* all p values are two-tailed

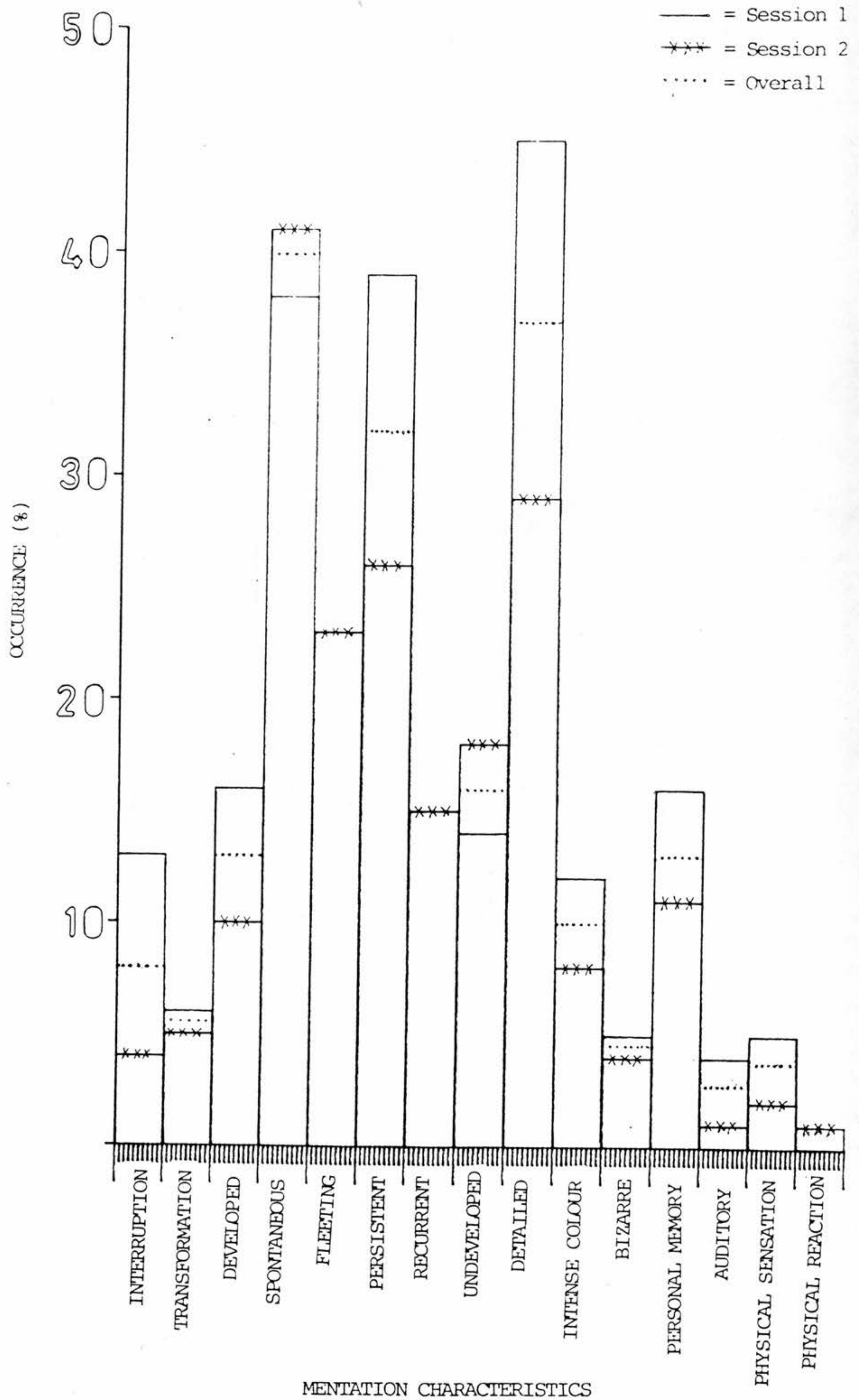
** insufficient data to compute

data. It would be expected to find two outcomes which were significant, at the 0.05 level, due to chance alone. One of the 40 analyses would be expected to be significant by chance at the 0.02 level. The significance level of the finding involving the agent having mental imagery is such ($p < .005$) that it is unlikely that this finding was due soley to multiple analysis, although this does remain a possibility. Of the other findings, the category involving colour ($p < 0.05$) and one of the two findings which were significant at the 0.02 level (active sending or unclear mental imagery/thoughts) are most likely due to multiple analyses effects, and no true significance can be claimed for them. Thus, given the large number of analyses conducted for this study, the agent mentation findings may be artifactual due to multiple analyses.

5. Histograms were made to examine whether the frequency of each mentation category varied from a) subject to subject, and/or b) within subjects (from session one to session two). Graphs of the individual subjects are presented in Appendix 10. The combined results of all subjects are presented in Figure 6.1. The information provided by these graphs have no relation to the psi scoring of the individual. Rather they are presented as a descriptive examination of the frequency with which various types of mentation occur in the ganzfeld.

a) Examination of the individual histograms (Appendix 10) demonstrates that there was considerable variation between the subjects in the frequency with which they experienced the various types of mentation. As shown in the graph which combines the results

Figure 5.1: Frequency (expressed as the percentage of occurrence in all a subject's mentations) of Mentation Characteristics: Across Subjects; by Session; and Overall



of all subjects (see Figure 6.1), the categories which showed the greatest frequency of occurrence across subjects were: detailed imagery, spontaneous imagery, and persistent imagery. The types of imagery which occurred least frequently were: imagery which prompted a physical reaction, auditory imagery, imagery which involved a physical sensation, bizarre imagery, and imagery which underwent a transformation. It should be noted that the above findings are based on the combined frequency of occurrence for all the subjects, and as such do not reflect the between-subject variation which occurred.

b) There were also differences found in the frequency of mentation types received within subjects, from their first to their second session. Again, individual differences were found regarding the extent of these between-session differences, with some subjects showing little change between sessions, and others displaying a considerable degree of change. As shown in Figure 6.1, the greatest within-subject change was observed for the categories of: detailed imagery, persistent imagery, imagery which interrupted a chain of thought, imagery which developed from an initally unclear impression, and imagery based on a personal memory and/or experience. The categories which displayed the least difference in frequency of occurrence across subjects were: fleeting imagery, recurrent imagery, imagery which prompted a physical reaction, imagery which underwent a transformation, and bizarre imagery.

6. None of the questions from any of the four questionnaires (the subject´s pre-session, subject´s post-session, agent´s pre-session,

or agent's post-session) correlated significantly with the Z-scores from the subjects' confidence ratings. The results of this analysis are presented in Table 6.4.

Table 6.4: Results of Correlations between Questionnaire Ratings and Subjects' Z-scores

| Subject pre-session questionnaire | Rho* | Associated Z-score |
|---|---|---|
| 1. degree of relaxation | -.090 | -0.56 |
| 2. general mood | -.192 | -1.20 |
| 3. expectation of success | .012 | 0.08 |
| 4. motivation for success | .111 | 0.69 |
| Agent pre-session questionnaire | | |
| 1. degree of relaxation | -.011 | -0.07 |
| 2. general mood | .157 | 0.98 |
| 3. expectation of success | .020 | 0.13 |
| 4. motivation for success | .010 | 0.06 |
| Subject post-session questionnaire | | |
| 1. degree of relaxation | .061 | 0.38 |
| 2. general mood | -.095 | -0.59 |
| 3. feeling of success | -.018 | -0.12 |
| 4. spontaneous, bizarre imagery | .080 | 0.50 |
| 5. pleasantness of experience | -.228 | -1.42 |
| 6. degree of altered state | -.076 | -0.47 |
| Agent post-session questionnaire | | |
| 1, degree of relaxation | .040 | 0.25 |
| 2. general mood | .229 | 1.43 |
| 3. alertness whilst sending | -.062 | -0.39 |
| 4. feeling of success | .033 | 0.21 |
| 5. liking of target | .021 | 0.13 |
| 6. pleasantness of sending | .112 | 0.70 |
| 7. degree of concentration | -.059 | -0.36 |
| 8. awareness of other pictures in set | -.025 | -0.15 |

*in all cases n = 40, df = 38

7. This analysis examined the confidence ratings assigned to the target picture, by means of a one-way anova. The variance between the means of the confidence ratings given to the target picture, when the ratings were grouped according to the ranks (1 to 4) allotted to the target, were examined. If a significant degree of variance was obtained, it would indicate a significant difference between the confidence ratings given by the subjects to the target, when they ranked it first, and the (sequentially lower) ratings given to the target when it was allocated one of the other three ranks. If a significant result was not obtained, it would indicate that the subjects had given relatively similar confidence ratings to the target picture, regardless of which rank they allocated to it; suggesting that they did not feel confident that they had been able to distinguish the target (by its degree of correspondence to the mentation report).

The anova on the overall results (df = 3, F = 7.65, $p < 0.001$), and that of the first session (df =3, F = 7.06, $p < 0.01$), were significant. However, for the second session it was not significant (df = 3, F = 1.68). The within-group variance was quite similar, for both sessions, and overall (sess. one var. = 345.25; sess. two var. = 371.66; overall var = 352.68). The difference lies in the between-group variance, where session two had a low variance (var. = 624.44), compared to that of session one (var. = 2444.58) and the two sessions combined (var = 2700.90). These results indicate that the subjects were less confident of their ability to correctly identify the target in their second session than they had been in their first session.

8.[1] a) A t-test comparing the correct (target was ranked first) and incorrect (target was given a rank from two to four) confidence ratings given by the subject to the first ranked picture for all sessions, was not significant (df=38, t=-0.86); showing that they were no more confident when they had correctly identified the target than when they had not. The negative value of the t-test indicates that they had in fact given slightly higher confidence ratings to their first ranked picture when it was not the target, than when they had correctly ranked the target.

b. A t-test, comparing the confidence ratings given to the subject's first-ranked pictures in session one to those of session two, was significant ($df = 38$, $t = 3.15$, $p < 0.005$). This indicates that the subjects were giving significantly lower confidence ratings

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1. These analyses were all criticised, by the same source as analyses 3, for: a) using a test which assumes normal distribution; and b) basing the tests of analyses 8.b. on the ratings, as the rating for any given picture may not be independent from those given to the other pictures in the target set, and thus they are not truly comparable on a session-to-session basis. Therefore, a <u>post hoc</u> test was carried out using standardised ratings. The data (the confidence ratings, and the standardised Z-scores of these ratings, of both the subjects and the independent judge) were tested, <u>post hoc</u>, for deviation from the normal distribution using the Kolmogorov-Smirnov one-sample test (Siegel, 1956). The null hypothesis was accepted for all the data of both the subjects and the independent judge, when grouped overall or according to session. Thus, the use of a t-test is permissible, as the data does not violate assumptions of normal distribution.

in the second session. This could reflect a general lowering of the subjects´ confidence in being able to correctly identify the target between sessions; or, it could indicate that the subjects were giving generally lower confidence ratings to all the pictures, because they were making fewer responses, or perceiving fewer correspondences to the pictures in the second session, than they had in the first. The latter possibilities were examined by converting the confidence rating alloted to the subjects´ first-ranked pictures into Z-scores in order to obtain a standardised rating (Stanford & Mayer, 1974).

A t-test comparing the Z-scores in session one to those in session two was not significant (df =38, t = 1.31). This demonstrates that the confidence ratings made in the second session were not significantly lower than those made in the first. Thus, the significant difference found in the ratings given to the first-ranked pictures between session one and session two may reflect a lowering of the subjects´ confidence. Was this lowering of confidence a generalised effect, or were the subjects displaying some discrimination in making their second session confidence ratings?

A further t-test, on the ratings alloted to the target when the target had been correctly identified (ranked first) between the two sessions, was non-significant (df = 8, t = 1.26). This shows that there was no significant difference in the degree of the subjects´ confidence between the two sessions, when they had correctly identified the target. Thus the initial finding reported above (analysis 8.b.) must be largely due to those sessions in which the subject had incorrectly identified the target.

A t-test between the confidence rating assigned to the first-ranked picture, when that picture was not in fact the target for that session, comparing session one to session two, was significant (df =28, $t = 2.86$, $p < 0.01$). This difference is further illustrated by the mean of the confidence ratings given to the first-ranked picture, when that picture was not the target. For session one the mean rating was 72.33, and for the subjects' second session it was 55.66. Thus, while the subjects' confidence did not change significantly between the two sessions when they had correctly identified the target, there was a significant change between the sessions when they had incorrectly ranked it. This could indicate that the subjects were 'learning' to recognise when they had not correctly identified the target. However, as the mean rating for when the target was correctly identified in the second session (mean = 52) was still lower than the mean of their confidence ratings when they had incorrectly identified the target (mean = 55.66), no 'learning' to correctly identify the target is suggested.

9. This analysis was performed to examine whether the subjects or the independent judge had demonstrated greater accuracy in making their confidence ratings. To examine this, ratings given by the independent judge to her first-ranked target picture were compared according to when she had correctly identified the target and when she had not (as was done for the subjects' data in analysis 8.a.).

The result from this test was not significant (df = 35, t = 0.93). However, this finding was in the right direction, indicating that, unlike the subjects, the independent judge gave slightly higher confidence ratings to the target when she had correctly identified it than when she had not. It should be noted that a test for difference between the variance of two independent samples (a test for homogeneity of independent variances, Bruning and Kintz, 1968) was conducted, comparing the variance of the subjects´ and the independent judge´s confidence ratings assigned to their first- ranked picture. The result was non-significant (var. 1, df =39: var. 2, df = 36, F = 1.45), indicating that the ratings of the two are comparable in the above manner.

10. A Spearman correlation test between the subjects´ confidence ratings and their liking ratings, for all the pictures, was conducted to determine whether the subjects´ judging may have been influenced by their personal liking for the pictures. This analysis obtained a significant outcome (n = 156, rho = 0.24, Z = 2.92, p < 0.003). This result suggests several possibilities. The subjects´ judging may have been biased by their preference for the pictures, so that the more they liked a picture, the higher it would be ranked (and thus receive a higher confidence rating). The reverse may also have occurred: where the more correspondences the subjects found with any given picture, the more they would like that picture. Or it is possible that, purely by chance, the subjects preferred those pictures which happened to have the most correspondence with their mentation reports? The next group of

analyses was conducted to examine these possibilities further.

11. These analyses were made to try to differentiate between some of the possible explanations for the results found in analysis 10. A similar analysis to that reported in analysis 10, carried out by the independent judge, had shown that her judging had not been influenced by her preference for the pictures (Milton, 1985b). It was felt that her data could be used as a ´yardstick´ against which the subjects´ data could be compared, if it was found that her confidence ratings showed a significant agreement with those of the subjects.

The confidence ratings of the subjects were therefore correlated with those of the independent judge. This analysis revealed a very strong, highly significant correlation between the two ($n = 148$, $rho = 0.402$, $Z = 4.87$, $p < 0.000001$). This demonstrates that the confidence ratings of the subjects and the independent judge were in strong agreement with each other. Given this agreement, the preference ratings of the subjects were correlated with the confidence ratings of the independent judge. If a significant correlation was obtained, it would suggest that the subjects by chance happened to prefer those pictures which also happened to have the greatest degree of correspondence with their mentations, as the independent judge´s confidence ratings were completely independent of the subjects´ picture preference. If a significant outcome was not obtained, it would suggest that the subjects´ judging had been influenced by their preference ratings, or <u>vice versa</u>.

The analysis between the subjects' preference ratings and the independent judge's confidence ratings was non-significant ($n = 144$, $rho = 0.136$, $Z = 1.62$). This suggests that the subjects' judging was biased by their preference for the pictures, or their preference for pictures was biased by the degree of correspondence between the pictures and their mentations. To distinguish between these two possibilities, a <u>post hoc</u> analysis was made using a Mann-Whitney U-test, comparing the liking ratings given to the target when it received a rank of one or two, to the ratings the target received when it was ranked three or four. If the subjects' liking for the target had been influenced by the degree of correspondence between a picture and their mentations, the target should receive higher liking ratings when it was given the highest ranks (<u>ie</u>, ranks of one or two), which would reflect the greatest degree of correspondence. This test proved non-significant ($n1 = 18$, $n2 = 21$, $U = 182.5$, $Z = -.184$, with tie correction). Thus, it appears that the subjects' judging was biased by their liking for particular pictures amongst the target set.

12. This non-statistical analysis was done in the hope that possible temporal relationships between the agent's activity and the subject's response would be suggested by comparing their time-matched mentation reports. The comparison was informally carried out, by the experimenter simply scanning the reports to note any observed time-linked correspondences.

The reports were also examined to determine whether there appeared to be more target-related correspondences during the sending period than at other times in the stimulus period. This was determined by adding the correspondence points allocated to the target during the sending period and comparing them to those allocated at other times. Any trends which appeared to arise from this examination would be treated as providing suggestive information, as no firm conclusions could be drawn from such informal analyses.

The results of the examination yielded only two instances where the mentations of the subject appeared to correspond, within a five second interval, to those of the experimenter. Given the thousands of mentation items which were compared, it is not surprising that a few correspondences were observed. It should be added that they were not exact correspondences, nor were they concerned with unusual or bizarre topics. To the best of her ability the experimenter also tried to examine those comments preceding and following her response, to see if any correspondence trends emerged. None could be detected. Lastly, no overall differences were found as to whether the subjects received more target-related information before, during, or after the sending period.

## §6.4 Discussion

The subject´s scoring in this experiment was remarkable only to the degree in which they mimicked exact chance scoring (MCE sum of ranks = 100, subjects´ sum of ranks = 102). Yet the independent judge´s results approached a one-tailed significance ($p < 0.053$, one-tailed). This may indicate that the subjects, despite their having attended a training session designed to improve their judging ability, were still not able to assess the correspondences between their mentations and the target pictures as well as the independent judge. As there was no control group who did not experience the training session, it is not possible to determine what effect, if any, the session had on improving the subjects' judging. However, these findings may suggest that the instruction given as to how to best perform the judging was not sufficient to enable naive subjects to judge as accurately as the independent judge. Regarding the importance of personal experiential knowledge of one's mentations in relation to the judging procedure, these results suggest, as did those of Palmer <u>et al.</u>, (1979), that, in some cases at least, skill and experience may be more helpful in recognising target/mentation correspondences than subjective knowledge of one's experiences during the stimulus period.

As the subjects were unable to detect, to a significant degree, any psi-related imagery which they may have experienced, the examination of the data for weak and strong correspondences may have been futile. Yet the findings here may also suggest that weak and strong correspondences are equally important in conveying psi-mediated information. The independent judge, whose data approached significance, performed the same analysis on her data and obtained similar results to those in this study.

The results of the analyses of the mentation categories are difficult to assess, given the lack of significant psi-scoring. One can only speculate whether, if significant ESP scoring had been attained, any of the mentation characteristics would have shown a significantly greater proportion of target-related information than any of the others. It is also possible, as perhaps suggested by the individual differences observed in the frequency with which the subjects experienced various types of mentation, that the types of mentation which might convey target-related impressions could vary from subject to subject. If this were the case, it is unlikely that any mentation characteristic could be identified using an across subjects analysis, as was done in this study.

Thus, by only considering the various mentation analyses (weak and strong mentations, and subject and agent characteristics) across subjects, as done in this study, it is possible that no target-related mentational characteristics could have emerged. If different subjects were obtaining target-related impressions more frequently from one type of mentation than another, but if such ´psi-conducive´ mentation types varied from subject to subject, the attempt to identify one or more overall psi-conducive mentation types(s) could be doomed to failure.

This study has been unable to identify any mentation characteristics which might provide a helpful guide to subjects whilst judging. Nor has any support been found for the findings of Sargent, Bartlett, and Moss (1982), which suggested that naive subjects scored better on the basis of unclear imagery, and experienced subjects better on the basis of clear imagery; or, for Milton´s findings relating psi-hitting to surprising imagery (Milton, 1984), and fleeting imagery to psi-missing (Milton, 1985a).

The results of the analyses of the agent´s mentations found significant relationships between the agent experiencing mental imagery, vague, unclear imagery, and/or actively sending to the subject, and target-related responses being made by the subject. The experimenter has previously noticed (see Experiment II, Chapter 5) that particularly striking target-related imagery would sometimes occur when the agent´s attention was temporarily distracted away from the target picture. This ´strategy´ was categorised in this study as occuring when the agent´s mentation had nothing to do with the target, and was not found to relate significantly to the subject making an immediate target-related response.

The significant agent mentation findings suggest that those specific agent ´activities´ or strategies may be beneficial to the subject receiving immediate target-related impressions. However, these results may be exaggerated due to multiple analyses. Also, the agent did not randomly vary her sending strategies throughout the sessions. Nor were any analyses made to see whether certain sending strategies may have significantly related to the subjects´ making target-related responses at some time during the session other than within a five second interval of the agent´s activity. Furthermore, the findings from this study were based on the sending of only one agent. Given the possible effect that different agents may have with different subjects (White, 1976b), these findings may not be generalisable to other agents. Thus the results from the agent mentation analyses may be seen as suggesting possible agent strategies beneficial to the subject receiving target-related impressions, but further research will be needed before any firm conclusions could be drawn.

The histograms examining the frequency with which subjects experienced various mentation types demonstrate that different subjects have different experiences in and/or reactions to the ganzfeld stimulus period. The possible psi influences of these individual differences were not addressed in this study. However, the variety of experiences demonstrated by the histograms stresses the importance of considering each subject as an individual, whose personal experience of the ganzfeld may vary considerably from others.

Examination of Figure 6.1 reveals that whilst spontaneous mentation was the second most frequently experienced type of mentation, characteristic of approximately 40 percent of all mentation responses, those responses which were classified as bizarre accounted for only five per cent of all mentation items. This finding is relevant to one of the questions commonly included in ganzfeld post-session questionnaires. The question under consideration normally reads: ´How would you characterize the quality of your mental activity whilst in the Ganzfeld? 0 = structured, rational, directed; 99 = spontaneous, dreamlike, bizarre´ (Sargent, 1980a, p. 106; and Palmer et al., 1979, p. 334). The degree to which the subject´s mental activity is spontaneous, dreamlike, and bizarre has often related to psi-hitting (eg, the more spontaneous, dreamlike, and bizarre, the more psi-hitting) (Sargent, 1980a). Given the high frequency of occurrence of spontaneously occurring mentation items and the relatively infrequent occurrence of bizarre mentations, it may be inappropriate to include both characteristics in the same question. A more accurate portrayal of the relationship of these characteristics to psi-hitting might be obtained if each were examined in separate questions.

None of the questionnaire items showed any significant correlation to ESP scoring. In light of the obtained chance-level ESP scoring, this is not especially remarkable. However, given the 22 analyses carried out, it is somewhat surprising that not even one test reached a one-tailed significance level, purely by chance.

The anova analyses of the confidence ratings mainly demonstrate that in the second session the subjects were 'hedging their bets'. The lack of significance in the anova for the second session demonstrates that the subjects were not reflecting their ranking of the pictures in their confidence ratings. Thus, the ratings for their higher-ranked pictures did not differ significantly from those for their lower-ranked pictures. This would seem to indicate that the subjects suffered a loss of confidence in their ability to either receive and/or recognise psi-related imagery. The t-test results indicate that their degree of confidence between the two sessions was not affected when they had correctly ranked the target. However, the significant finding between the two sessions when they had not correctly ranked the target, resulted from the ratings of the second session being lower than those of the first. This may indicate that the subjects, while not learning how 'to do it right', were picking up some information leading them to recognise when they had 'done it wrong'.

The analysis on the confidence ratings of the independent judge demonstrated that, like the subjects, she was unable to distinguish between correct and incorrect target choices. However, unlike the subjects, she did display a (non-significantly) higher degree of confidence when the correct target had been chosen, than when it had not. This could be seen as lending tentative support to the concept that judging skill and experience are more valuable than subjective experience of one's mentations in recognising target/response correspondences.

The correlations examining the subjects' confidence and liking ratings suggest that their judging had been swayed by their personal preference for particular pictures. In the subjects' training session it was stressed that they should be careful to not let their judging be influenced by their personal liking for the pictures. Furthermore, they had been provided with examples from other sessions, where judging had been detrimentally biased by personal liking effects. The findings of this study suggest that training of the type offered here was not sufficient to stop the subjects from being influenced by their picture preference.

The analysis looking for time-linked correspondences between the subjects' and the agent's mentation reports was conducted on the basis of some correspondences, obtained in a previous study (Experiment II), which appeared to be time-linked; and to examine various observations by others about the receiving of psi-mediated impressions in relation to the sending period. As this author is unaware of any findings which suggest that there is a time-link between the subject's response and the agent's activity or thoughts, this analysis was completely exploratory. As it happened, the examination yielded no results which could even be considered to be suggestive of any such effect.

There were several problems encountered in conducting this analysis. First, there were literally thousands of mentation items to be judged. The method of judging simply consisted of the exerimenter reading one mentation of the subject, comparing it to the appropriate time-matched mentation of the agent, looking for obvious correspondences, and so on through all the mentation reports. After the first few reports had been examined, and it had become obvious that few if any time-matched correspondences had occurred, the experimenter quickly tired of the time-consuming judging process. The size of the judging task was such that no types of correspondences, other than literal correspondences (ie, agent's mentation was 'dog', subject's mentation was 'dog') were considered. Furthermore, as there were no 'controls' against which the correspondences were being judged, no real claims could be made for any findings which arose.

A possible methodological improvement to the judging of this data would have been, to have had a randomly selected sample of the agent's mentations from each session transcribed by a person not otherwise connected with the study. Such a transcript could then be independently judged for correspondences with the appropriate time-matched mentation of the subject, which would be placed with a control sample of other mentation items, and then also independently judged. This would have decreased the number of correspondences under consideration, allowing for a more thorough consideration of correspondence types. It would also have provided a MCE which would have allowed for various statistical analyses to be carried out on the results. However, there were no findings in this analysis to suggest that a more formal analysis would have received a different outcome.

One aspect of this study which may have contributed to the chance level of scoring was that the judging procedure of the subjects was very time-consuming, and required a good deal of concentration. Most subjects took between one and three hours to complete their judging. Furthermore, as they were unsupervised during the task, if they did tire, there was no supportive person to try to restore their morale.

Two pilot sessions using this judging procedure had been conducted, and in both sessions the subjects finished their judging within an hour and a half's time. Both subjects also found the mentation-characteristic form easy and interesting to complete. However, as the two subjects in the pilot sessions were the experimenter and the independent judge, it is not surprising that they took greater interest in the judging procedure than the subjects might have done. Furthermore, as both of these 'subjects' were experienced judges, they may have found the judging task in general to be much quicker and less demanding than the other, largely naive, subjects.

There is no way of knowing how the length and complexity of the judging procedure may have affected the study's outcome. However, if a similar study were to be run again, a subject experimenter would be used. This would eliminate the need for the subject to go through the time-consuming task of replaying his mentation tape, and entering each mentation item onto the judging form. Aside from substantially decreasing the duration of the judging, a subject experimenter may have been useful in clarifying how to classify the mentation responses according to their characteristics, and would have helped to keep the subjects' motivation for the task at a higher pitch.

# CHAPTER SEVEN

# DISCUSSION AND CONCLUSIONS

## §7.1 Overall Results: Psi Scoring

No significant overall psi scoring was obtained in any of the three studies conducted for this thesis. Thus, these studies offer no support for viewing the ganzfeld as a psi-conducive technique. Nor do they provide any evidence of the existence of psi. However, the author still believes that the evidence gathered by others presents a strong case that argues against accepting psi as an experimental artifact. Furthermore, for reasons elaborated upon in the second chapter of this work, it is her opinion that the replication rate of the ganzfeld still requires the technique to be seen as psi-conducive. If psi does exist and the ganzfeld is a psi-conducive technique, why did the studies presented herein fail to obtain any evidence in support of these concepts?

Until an understanding of the ´why and wherefore´ of psi functioning is arrived at, the reasons for the lack of significant scoring can only be speculated upon. The following discussion will address some possible explanations for the outcome of these studies. The reasons to be considered can be classified into two general areas: a) the procedure adopted in these studies; and, b) experimenter effect.

### Procedural Problems

The first study (Experiment I, presented in Chapter 4) contained two experimental procedures which may have adversely influenced the study's outcome: a) the use of a ringing telephone to signal the end of the stimulus period to the subjects; and b) the fact that the subjects were unable to review their mentations prior to or during the judging of the target set. Both of these procedures were altered in the second study (Experiment II, presented in Chapter 5).

In Experiment II, the end of the stimulus period was signalled to the subjects by means of a recorded message. This message encouraged the subjects to remain in the ganzfeld until they felt ready to proceed with the judging task. This eliminated the hurried and unpleasant experience brought about by the use of a ringing telephone in Experiment I. Experiment II also allowed the subjects to review their mentations,by means of a tape recording containing all their responses made during the stimulus period. This removed the possibility of the subjects forgetting some of their imagery and, thereby, possibly missing some correspondences which might have been contained within those responses.

The second experiment, while not showing overall significant ESP scoring, did obtain significant psi scoring from two of its subjects. It is possible that if these two subjects had not scored in opposite directions (one psi-hit, and the other psi-missed) significant overall results may have been forthcoming.

While this study contained no obvious procedural problems for the subjects, one of them did comment that he felt that two aspects of the study's design were negatively affecting his ESP scoring.

These were the length of the stimulus duration, and the agent hearing the subject's mentations as they were made. The possible negative influence of a stimulus duration of 30 or more minutes with experienced subjects before 1982 has been discussed in Chapter 5, although a more recent study by Sargent, Bartlett, and Moss (1982) obtained significant ESP scoring from experienced subjects using 30 minutes of ganzfeld stimulation. Thus, the findings from previous research are inconsistent.

Discussing his feeling that his ESP performance was being negatively affected due to the agent hearing his mentations as they were being made, the subject reported feeling as if the agent was trying to impose target-related impressions upon him during the stimulus period. This resulted in the subject feeling as if he were mentally fighting the agent. It may be that such a reaction to the procedure was an idiosyncrasy of this particular subject, since no other subject reported the same feeling. Since null results were obtained in both Experiments I and II, in which the agent heard the subject's mentations, and also in Experiment III, when she did not, these studies provide no indication as to whether such a procedure may inhibit success.

Another procedural factor which may have influenced the outcome of the first two studies involved the number of pictures comprising each target set. In both of these studies the target sets consisted of six pictures. It was often difficult to find six pictures which were truly disparate from each other in terms of colour, shapes, and subject matter, and there were several occasions on which the subjects reported being torn between two pictures which shared some features. Also, the more pictures in a target set, the more the subject must consider during the judging procedure. Judging is an involved and detailed task, which, to be properly conducted, requires considerable concentration and effort on behalf of the subject; if the subject has to cope with too many pictures, errors may arise. Therefore in Experiment III the target sets contained only four pictures. However, this decrease in the number of pictures to be considered during the judging had no apparent effect upon the ESP scoring in this study.

In Experiments II and III the results may have been negatively influenced by the length of the judging procedure. The reviewing of mentations by means of a tape recording can be a lengthy process. First the subjects must rewind the tape. They then must listen to the entirety of a more than 30 minute recording, which may contain long periods of silence. If they are speaking rapidly they will probably need to stop the tape recorder after each mentation item, in order to consider it fully with respect to each of the possible target pictures. Indeed, in both Experiment II and Experiment III the subjects were instructed to stop the recorder after each mentation item.

Although the possible confounding influence of a subject experimenter, as discussed in Chapter Two, is still of concern, any such influence may be the lesser of two evils. Given the crucial importance of the judging procedure to a ganzfeld study, everything should be done to make the task for the subject as engaging and enjoyable as possible. The tiresome procedure with a tape recorder, and the lengthy listening to a long recording, may well have dampened the subjects´ enthusiasm for the judging procedure. The use of a subject experimenter would eliminate these time-consuming and potentially boring problems.

Thus, the lack of a subject experimenter may have contributed to the non-significant level of ESP scoring found in Experiments II and III. However, it should be pointed out that in neither of these studies were the personnel available to the experimenter to allow a subject experimenter to be included in the experimental procedure.

Possible Experimenter Effects

Another possible reason for the lack of significant scoring may be the ubiquitous ´experimenter effect´. This effect has been defined by Thalbourne (1982, p. 26) as:

> An experimental outcome which results not from manipulation of the variable of interest ´per se´, but rather from some aspect of the particular experimenter´s behaviour, such as unconscious communication to the subjects as to what is expected of them, different ways of treating subjects, or possibly even a psi-mediated effect working in accord with the experimenter´s desire to confirm some hypothesis.

The experimenter effect may be called ubiquitous because it refers to a vast range of influences, including the unconscious desires and/or motivations of the experimenter (for reviews of the effect see White, 1976c, and Kennedy and Taddonio, 1976). The three main ways in which an experimenter effect may have influenced the outcome of these studies involve the experimenter's interaction with subjects, experimenter/agent effects, and the unconscious suppression of psi-scoring on the part of the experimenter.

All of the subjects in Experiments I and II were friends of the experimenter, and relationships with the participants in all three studies seemed friendly. Thus it seems unlikely that any straightforward aspect of the experimenter/subject relationship may have had a negative effect on the scoring of the subjects.

It is possible that the experimenter was not, for whatever reason, a good agent (even although she finds the role both interesting and enjoyable). In Experiments II and III the experimenter acted as the agent in all of the trials. Thus the lack of overall psi-hitting in these studies could have been due to some sort of agent-related effect. However, in Experiment I, the experimenter acted as the agent in only a third of the sessions. As was shown in a post hoc analysis, there was no significant difference in psi-related performance between the three agents used in that study. It of course is possible that none of the agents were 'good' agents. However, in the absence of significant effects, no conclusions can be drawn regarding the possible influence of an experimenter effect via the agent.

The possibility of unconscious experimenter effects is difficult to address. The experimenter did, to the best of her knowledge and understanding, genuinely want to obtain significant overall above-chance scoring in these studies. Furthermore, she is convinced, both by examination of the literature and personal experience, that the ganzfeld is psi-conducive. These points could argue against an experimenter effect negatively affecting the overall ESP scoring.

Another possibility is that the experimenter has an unconscious fear of psi (Tart, 1984; Irwin, 1985). This could prove a particular problem in ESP training studies, since there could be misuses of psi ability once it had been trained. However, the author believes that it is better for such training methods to be employed by conscientious researchers, who have considered the possible misuses, than by others whose motives may not be altruistic. Nevertheless, a fear of psi could still be present in the author, despite her conscious attitude of acceptance.

Thus, no reasons as to why significant overall psi was not obtained in these three studies can be conclusively identified. Several aspects of the procedure used which may have inhibited the appearance of psi have been discussed, particularly factors relating to the length of the judging procedure.

However, it should be mentioned that even if significant results had been obtained in these three studies, this would not necessarily argue in favour of the ganzfeld, or some aspect of the technique, being, in and of itself, psi-conducive. As has been previously discussed, the ganzfeld is a technique which is fun and enjoyable for both the experimenter and the participants. The apparent success of the ganzfeld could be due to factors involved in the experimenters´ and participants´ perception of the ganzfeld, rather than to factors having to do with the technique per se. Thus, experimenter effects and the motivation and/or expectancies of the participants could account for the techniques' apparent success.

## §7.2 Findings Related to the Training of ESP

Tart (1977b) has stressed the importance of only trying to train subjects who have first shown the ability to demonstrate ESP. The logic of first needing to elicit whatever phenomena is to be developed is obvious. Given the lack of significant scoring in the studies conducted for this thesis, it is perhaps not surprising that no improvement in psi scoring across sessions was found in Experiment II. Experiment III was conducted in an attempt to discover factors which could aid subjects and agents to better perform the judging and sending tasks. Such factors, if identified, could be used to help improve psi scoring in ganzfeld experimentation. Again, the lack of overall significant ESP scoring may have confounded these efforts.

Both Experiments II and III were aimed at trying to help subjects to recognise response/target correspondences which may not be otherwise recognisable, due to transformation errors. The experiments failed to achieve that goal. However, they have provided information which may prove of value to others undertaking training studies, and for ganzfeld experimentation in general.

The subjective reports obtained in Experiment II gave interesting and useful insights into the functioning of subjects, concerning their receiving of impressions during the stimulus period, and difficulties encountered during the judging procedure. Regarding the receiving of impressions, all of the subjects engaged in activities which they had been advised against (screening of mundane imagery, and actively trying to obtain target-related imagery). Furthermore, the subjects did not cease these activities until they had learned from personal experience that such strategies appeared to be counter-productive. This suggests that the procedure normally used in most ganzfeld studies, of simply giving subjects instructions regarding such activities, is inadequate.

The subjects were discovered to engage in two further activities generally thought to be counter-productive to the obtaining of target-related impressions; viz., the making of associative ramblings, and mis-naming errors. No published ganzfeld studies mention bringing these problems to the subjects' awareness. The subjects in Experiment II had little difficulty in abandoning the habit of making associative ramblings, and had varying success in overcoming mis-naming errors. This suggests that the instructions given to subjects before they experience the ganzfeld stimulus should include remarks warning them against such activities. Such instructions may be sufficient to help subjects to avoid some of the pitfalls experienced by the subjects in Experiment II.

Regarding the judging procedure, there were numerous examples of situations where target-related correspondences which were not simply literal went unrecognised. Also, the subjects were sometimes apparently blinded by their preference for, or personal associations with, certain responses and/or pictures. Most subjects were able to learn to avoid some of these problems, but other types of errors proved quite difficult for them. What was easy for one subject to learn, was difficult for another. In this respect they all reacted somewhat differently. Due to these individual differences, it seems unlikely that any one type of training in error recognition will be equally advantageous to all subjects. However, given that they all appeared to learn to recognise at least a few of the types of correspondence errors, it may prove to be worthwhile to provide subjects with some initial training aimed at aiding them in recognising these errors. This might be combined with training on an individual basis, to help them to correct idiosyncratic problems as the training progressed.

The influence of such a training session cannot be evaluated, as there was no control group, not participating in a training session, in Experiment III. However, the fact that the independent judge's evaluation of the data revealed a (non-significantly) higher degree of psi scoring than that of the subjects may suggest that the training provided was not adequate to raise the subjects' judging ability to the same level of competence as that of the independent judge. Furthermore, such training proved ineffective in teaching the subjects not to be influenced by their perference for particular pictures. It should be mentioned that as the independent judge was also a subject in this study, she did participate in a training session. She thought the instructions provided were comprehensive, and could not think of any type of judging strategy which she used which was not covered in the training.

The chance-level scoring obtained in Experiment III may be indicative of no ESP being elicited from the subjects. If this is the case, then the differences found between the results of the subjects and the independent judge do not reflect any real difference in judging ability between the two. Alternatively, it is also possible that some ESP was elicited from the subjects, but not to a great enough degree to result in significant psi scoring. If this was the case, then the difference between the results obtained by the independent judge and by the subjects may be seen as indicative of differences in judging competence. This would suggest that in developing skill as a judge, training of the type given in Experiment III may not result in a level of competence equal to that gained from previous experience of judging. Hence, the best manner to train subjects to develop their judging competence could perhaps entail having them gain actual experience, by acting as independent judges.

## §7.3 Concluding Remarks

The three studies conducted for this thesis represent a total of 142 ganzfeld sessions, participated in by 29 subjects. No overall significant display of ESP was obtained. Nor was any evidence forthcoming that the subjects had learned to recognise transformation errors, and thereby improve their ESP scoring. The attempt to isolate response characteristics which might aid subjects to better recognise target-related responses was not successful. The one sure 'finding' of these studies is that ESP is most elusive indeed!

The author has raised possible explanations for the lack of overall significant ESP scoring earlier in this chapter. Although none of her ganzfeld studies obtained significant overall results, the review of the ganzfeld presented in Chapter 2 nonetheless presents a strong argument that the ganzfeld technique in fact is psi-conducive. Although no progress in training subjects to learn to better recognise responses which may contain ESP-originated information was made in these studies, the need for more reliable ESP scoring remains of paramount importance to the field. In conclusion, the author shares the sentiments expressed by Beloff (1967, p. 128) when, writing of failed psi training attempts, he wrote:

> However, the problem [replicability of psi results] is still with us. On the one hand, we have as yet no firm experimental evidence to support the claims of any of the methods that have been suggested as a means of training or cultivating paranormal abilities but, on the other hand, we still have an urgent need for one. In the circumstances, what can we do but back our hunches and keep on trying?

DIRECTORY OF APPENDICES

Appendix 1

The 72 ganzfeld psi studies published as of 1985, are listed below in alphabetic order.

Ashton, Dear, Harley, & Sargent, 1981
Bierman, Brendsen, Koenen, Kuipers, Louman, & Maissan, 1984
Braud, 1978b (2 experiments reported)
Braud, Ackles, & Kyles, 1984
Braud, Shafer, & Mulgrew, 1983 (2 experiments reported)
Braud & Wood, 1977
Braud, Wood, & Braud, 1975
Child & Levi, 1979
Child & Levi, 1980
Child & Levi, 1981
Delanoy, 1982
Delanoy, Parker, & Wilson, 1981
Dunne, Warnock, & Bisha, 1977
Haraldsson, 1979
Habel, 1976
Honorton, 1976
Honorton & Harper, 1974
Ianuzzo, 1985 (7 experiments reported)
Keane & Wells, 1979
Kelly & Varvoglis, 1979
Milton, 1984
Milton, 1985a
Palmer, 1979
Palmer & Aued, 1975
Palmer, Bogart, Jones, & Tart, 1977
Palmer, Khamashta, & Israelson, 1979
Palmer & Lieberman, 1975
Palmer & Lieberman, 1976
Palmer, Whitson, & Bogart, 1980
Parker, 1975a
Parker, Millar, & Beloff, 1977
Raburn & Manning, 1977
Rogo, 1976a (2 experiments reported)
Rogo, 1977

Rogo, Smith, & Terry, 1976
Roney-Dougal, 1979
Roney-Dougal, 1982
Sargent, 1980a (5 experiments reported)
Sargent, 1982
Sargent, Bartlett, & Moss, 1982
Sargent & Harley, 1982
Sargent, Harley, Lane, & Radcliffe, 1981
Sargent & Matthews, 1982
Schacter & Kelly, 1975
Schacter & Kelly, 1976
Schmitt & Stanford, 1978
Smith, Tremmel, & Honorton, 1976
Sondow, 1979
Sondow, Braud, & Barker, 1982
Stanford, 1979
Stanford & Angelini, 1984
Stanford, Angelini, & Raphael, 1985
Stanford & Neylon. 1975
Terry, 1976
Terry & Honorton, 1976 (2 experiments reported)
Terry, Tremmel, Kelly, Harper, & Barker, 1976
Wood, Kirk, & Braud, 1977
York, 1976

The List of the 28 Ganzfeld Studies Reporting Direct Hits Which Form the Data Base for Honorton's 1985 Ganzfeld Meta-Analysis

Ashton, Dear, Harley, and Sargent, 1981
Braud, Wood, and Braud, 1975
Child and Levi, 1979
Honorton, 1976
Honorton and Harper, 1974
Palmer and Aued, 1975
Palmer, Bogart, Jones, and Tart, 1977
Palmer, Khamashta, and Israelson, 1979
Raburn and Manning, 1975 (GESP cell)
Raburn and Manning, 1975 (Clairvoyance cell)
Rogo, Exp. I, 1976a
Rogo, Exp. II, 1976a
Rogo, Smith, and Terry 1976
Sargent, Exp. I, 1980a
Sargent, Exp. II, 1980a
Sargent, Exp. III, 1980a
Sargent, Exp. V, 1980a
Sargent, Exp. VI. 1980a
Sargent, Bartlett, and Moss, 1982
Sargent, Harley, Lane, and Radcliffe, 1981
Sargent and Matthews, 1982
Schmitt and Stanford, 1978
Sondow, 1979
Sondow, Braud, and Barker, 1981
Terry and Honorton, Exp. I, 1976
Terry and Honorton, Exp. II, 1976
Wood, Kirk, and Braud, 1977
York, 1977

## APPENDIX 3

The List of the 36 Ganzfeld Studies Which Form the Data Base for Hyman´s 1983 and 1985 Ganzfeld Meta-Analysis

Ashton, Dear, Harley, and Sargent, 1981
Braud, Wood, and Braud, 1975
Braud and Wood, 1977
Child and Levi, 1979
Habel, 1976
Honorton, 1976
Honorton and Harper, 1974
Palmer and Aued, 1975
Palmer, Bogart, Jones, and Tart, 1977
Palmer, Khamashta, and Israelson, 1979
Parker, 1975a
Raburn and Manning, 1975 (GESP cell)
Raburn and Manning, 1975 (Clairvoyance cell)
Rogo, Exp. I, 1976a
Rogo, Exp. II, 1976a
Rogo, 1977
Rogo, Smith, and Terry 1976
Roney-Dougal, 1982
Sargent, Exp. I, 1980a
Sargent, Exp. II, 1980a
Sargent, Exp. III, 1980a
Sargent, Exp. V, 1980a
Sargent, Exp. VI. 1980a
Sargent, Bartlett, and Moss, 1982
Sargent, Harley, Lane, and Radcliffe, 1981
Sargent and Matthews, 1982
Schmitt and Stanford, 1978
Smith, Tremmel, and Honorton, 1976
Sondow, 1979
Sondow, Braud, and Barker, 1981
Terry, 1976
Terry and Honorton, Exp. I, 1976
Terry and Honorton, Exp. II, 1976
Terry, Tremmel, Kelly, Harper, and Barker, 1976

Wood, Kirk, and Braud, 1977
York, 1977

"A Three Subject Study of Psi in the Ganzfeld" as published in Research in Parapsychology 1980 (Delanoy et al., 1981).

"A Three Subject Study of Psi in the Ganzfeld" by Deborah Delanoy, Adrian Parker, and Kathleen Wilson (University of Edinburgh)

There is now an impressive amount of evidence for the ganzfeld as a repeatable psi-conducive technique. Results to date appear to be independent of subject characteristics. However, certain authorities have stressed the importance of the experimenter's own prior personal experience with the technique. It was both with this objective and that of evaluating the efficacy of the technique, that the present study was undertaken.

The three subjects, D.D., A.P., and K.W., each underwent ten sessions of ganzfeld. As well as acting as a subject, each participant contributed ten sessions as an agent; five for each of the other two subjects. Each ganzfeld session lasted 30 minutes. Continuous mentation reports were given by the subjects during the session, and these mentations were recorded and simultaneously heard by the agent.

The target pools consisted of 30 sets of six pictures each, with each agent selecting ten sets according to his own preferences. Targets were selected using a random number generator on a p of 1/6 basis. The target pool consisted of 180 cards, with each individual set being used only once in the course of the experiment. It was anticipated that this aspect of the procedure would reduce possible displacement effects. Duplicate sets of each of the 30 target packs were provided for both subject and agent, to eliminate any possible cueing effects. The subject was in a cubicle, located at the far end of the parapsychology laboratory, and the agent was stationed in a classroom adjacent to the laboratory.

Each subject was fitted with the choice of either green or red translucent hemispheres taped over the eyes, followed by a set of earphones receiving white noise. the volume of the white noise and the position of the red light directed at the hemispheres were adjusted so that the subject felt comfortable. The subject, seated in a reclining chair, then received 30 minutes of ganzfeld stimulation, while the agent concentrated on the target picture.

The session's termination was signaled by the continuous ringing of a telephone until contact was broken by the subject. No communication was allowed between subject and agent until the subject had completed the ranking of the duplicate target set. Feedback was then limited to nonspecific comments until all 30 sessions had been completed. At the completion of the experiment, the subjects rated each of their target sets (from 1-10), according to their personal preference for the pictures.

<u>Results</u>

It was hoped that, using the ganzfeld technique, subjects would produce overall psi-hitting. Using ranks one to three as hits, a total of 17 hits were recorded. The sum of ranks obtained was equal to 97 (MCE = 105, Z - .80 (corrected for continuity), p = .21, one-tailed). Hits were equally distributed between subjects. Currently, the mentation tapes are being transcribed to allow for independent judging. A secondary analysis for sum of rank scores (p = 1/2) was also non-significant. An analysis for picture preference revealed that subjects gave a higher ranking to preferred pictures. The biasing or non-biasing of target packs in this manner did not, however, relate to positive scoring.

It is worth noting that all participants had a high expectancy relating to a positive outcome of the experiment, and the conditions were considered to be psi-conducive.

APPENDIX 5

"The Training of Psi in the Ganzfeld" as published in Research in Parapsychology 1981 (Delanoy, 1982).

"The Training of Psi in the Ganzfeld" by Deborah Delanoy (University of Edinburgh)

The most frustrating problem in parapsychological research is the unreliable nature of psi. Various methods for the training of ESP have been devised in an attempt to solve this problem. But none has of yet produced dependable increases in the subject's ESP scoring. However, several factors have repeatedly been shown to be conducive to psi-hitting. These features are the personality characteristics of extraversion (Sargent, Personality and Individual Differences, 1981, 137-43) and belief in ESP (being a "sheep") (Thalbourne, SPR Conference, 1981), and the psychophysiological effects of being in an altered state of consciousness (Honorton, in Wolman Handbook, 1977). The Ganzfeld technique is, to date, the most promising method of creating a psi-conducive altered state of consciousness with a success rate of approximately 50 percent (Blackmore, EJP, 1980, 213-20). This study was designed so that extraverted sheep were repeatedly tested under Ganzfeld conditions with a view to producing reliable increases in their ESP scoring. At the conclusion of each session, a detailed introspective report of the subjects' experiences was elicited. Thus, by exposure to the Ganzfeld, followed by an introspective examination, it was hoped that subjects would learn to distinguish between psi-mediated and non-psi-mediated responses. The primary hypothesis was that above-chance scoring would occur in all subjects and that subjects´ scoring would improve across sessions. It was also thought that valuable information concerning the efficacy of various strategies employed by the subjects would be disclosed by the introspective reports.

Six subjects, who scored above the population average on extraversion (as measured by Exysenck´s Personality Inventory), and on belief in and experience of ESP (as measured by Thalbourne and Haraldsson´s Sheep-Goat Scale [Personality and Individual Differences, 1980, 180-85]) were selected. Each subject underwent 12 sessions of Ganzfeld stimulation. The subjects were run in two groups, the first three subjects between November and February and the next three during March and early April. The standard Ganzfeld procedure (Sargent, Parapsychological Monographs No. 17, 1980) was used, with the exception of there being no transcriber. Instead, the subjects´ mentations were recorded on a tape that the subjects replayed in order to review their mentations before judging the targets. Each Ganzfeld period lasted for 32 minutes, the end of each being signaled to the subject by means of a recorded message. Targets for each session were drawn form 13 different target sets, each set consisting of six pictures selected to be as diverse as possible from each other in terms of color, form, and content. Target sets for each session were randomly chosen so that no subject was presented with the same target set more than once, and so that the agent, who in all cases was D.D., would not have recently seen it. Specific targets for each session were determined by a number taken from a random-number table by a person not otherwise involved in this experiment. After having listened to their mentation tape, subjects rank-ordered a duplicate set of target pictures according to the degree of correspondence between their mentations and the pictures. When the judging was completed, the subject notified the agent, who was waiting outside the room. The subject then received feedback as to the correct target and the agent reviewed the mentations with the subject pointing out details of correspondence between the mentation report and target. A discussion followed in which the subject elaborated on his or her introspection, particularly exploring the various types of imagery received and the manner in which they were received. Possible strategies for success were developed and apparent pitfalls were identified.

The data were first analyzed using a sum of ranks. There was no overall significant psi-scoring. However, the first three subjects who were tested did display significant psi-missing ($p = .016$, two-tailed). The later group scored in the psi-hitting direction, but not signidicantly so. Of all six subjects two obtained individual significant scores, one psi-missing ($p = .008$, two-tailed) and another psi-hitting ($p =.034$, two-tailed). The 12 scores obtained for each subject were correlated with session number in order to see if there was a significant increase in ESP scoring over trials. No inclines were found either for individual subjects or for all subjects as a group.

Although some interesting information was gathered from the introspective reports, it must be stressed that all of these reports were highly subjective by nature and that the following comments, at best, reflect the general experience of most of the subjects as perceived by the experimenter.

It became apparent that the majority of subjects had some preconceived ideas regarding the receiving of impressions during the Ganzfeld stimulus period. First, most of them tended to disregard impressions that they felt were derived entirely from personal experiences or concerns, concluding that therefore they were not related to the target. Second, all the subjects at some point actively tried to "send their mind" to the target that the agent was viewing. Both of these inclinations tended to disrupt any altered state of consciousness that had been achieved and gave rise to feelings of frustration as the subjects thought that they were "failing" at the task of receiving target-relevant images.

Two other problems regarding the receiving of images were also identified. The imagery that appeared was often vague and unclear. Rather than describe as best they could what they were seeing, there was a strong inclination to label the impressions as something familar (e.g., a solid rectangular shape was interpreted as a door, or a floating semicircle was called a dome). This tendency to interpret could result in the misnaming of the image. This leads to another problem, which could be termed "associative chains of thought." Once an impression was named, the images that followed were often parts of a train of thought that appeared to be arising from ordinary psychological associations (e.g., the solid rectangular shape that was labeled a door would then become a door in a cottage, and the cottage and its setting would then be described in detail). These associative ramblings almost never led to target-related images.

In the actual judging of the targets, the subjects identified two further areas of difficulty. First, they found it quite difficult to evaluate the pictures without being influenced by their aesthetic and emotional preferences. The second problem was their failure to break a picture down into its various components (shape, color, etc.) so as to view them separately from the overall representational context in which they were embedded.

A future experiement is planned to try to rememdy these inappropriate subject strategies.

APPENDIX 6

The Instruction Sheet Given to the Subjects in the Training Session of Exp. III (copies of these instructions were also provided for review during the ganzfeld sessions)

THINGS TO REMEMBER DURING STIMULUS PERIOD

1. Relax!
2. Keep your eyes open.
3. Say out loud everything you experience, as it occurs.
4. Do not try to obtain imagery, just relax and let it come to you.
5. Forget about the experiment. Do not worry about the agent or whether you are receiving any ESP related imagery.
6. If some imagery does not take any recognizable form, do not try to 'turn it into' some recognizable object. Just describe its form as best you can.
7. Try not to follow long chains of thought.

THINGS TO REMEMBER DURING THE JUDGING

1. Take your time! Do not be in a hurry to finish.
2. Study each of the four target pictures very carefully. Try to to examine each picture from these two perspectives: 1st: Look at it analytically, consider the picture as a whole and in terms of its various components. Observe carefully everything that is contained in the picture, down to its smallest details. Make note of the various shapes contained in the picture and examine these from different angles (i.e. look at the various shapes in the picture when it is viewed upside down); 2nd: Look at the picture from a more personal and and holistic perspective. Try and receive general impressions from the picture. Also think of any associations, personal or otherwise, which you might have towards the picture.
3. Make a note of each item of mentation on the judging form. Complete the imagery categorization for each mentation.
5. Rate each picture according to its degree of correspondence

where each mentation. Use a 1-5 scale where:

1 = a small degree of possible correspondence

2 = a stronger correspondence than for a 1 rating, but still not a particularily convincing match

3 = there is a definite correspondence, but it is lacking in some respect(s)

4 = a good correspondence, there are marked similarities between the target and the mentation item

5 = an excellent correspondence with little, if any, dissimilarity

6. The various types of correspondence which you should be looking for are as follows:

Direct correspondences - What you experienced is contained in the picture (to some degree); e.g. you saw a flower and there are flowers in the picture.

Associative correspondences - The mentation has an associative relation to the picture. This association can be either personal, e.g. you saw your father and there is a father-like figure or something which you associate with your father (a pipe perhaps) in the picture; or, of a more general nature, e.g. you felt thirsty and the picture is of a desert scene.

Similarities of features and/or shape - e.g. you have an image of a floating half circle and there is an umbrella in the picture.

Similarities of meaning and/or purpose - e.g. You have an image of a train which could relate to another form of transportation or to travelling.

Symbolic correspondences - Examples of this could be having an image of a thunderbolt when Zeus was in a picture, or seeing a lion when the picture has a courageous theme or component.

7. When performing the final ranking (1st choice, 2nd choice, etc.) of the target pictures, you should rank them in order of the number of correspondence points each picture received. Thus, the picture which is chosen as the target for that session should be the one which had the highest score after you added up all the ranking points given to each picture. The

only time the above procedure should not be followed is when you had some outstandingly excellent correspondences to a picture, which nevertheless ended up with fewer points than another picture, which contained more correspondences but of a much poorer quality. However, as a general rule, do not allow your judging to be swayed by a few mentation items. You may not tie any ranks. If two pictures have the same number of correspondence points, rank the picture which had the better quality of correspondences above the other.

8. When doing the judging try to disregard any personal preferences in terms of liking or disliking which you may have towards the pictures.
9. As a general rule of thumb, let logic, not intuition, be your guide whilst judging.
10. The final aspect of your judging will be to give a confidence rating (0 to 99) to each of the four pictures. Thus, for each of the four pictures, ask yourself "how confident am I that this is the target?" This will result in a decrease in your ratings which corresponds to the rank given the picture (your first ranked picture will have a higher confidence rating than your lower ranked pictures). You may give the same confidence rating to more than one picture if you wish. However, you may not give a lower ranked picture a higher rating than a higher ranked one.

APPENDIX 7

The Imagery Categories (Characteristics) Examined in Exp. III
(The following list was given to the subjects.)

IMAGERY CATEGORIES

TYPE OF IMAGE:

Interrupts a Chain of Thought: an image which interrupts a series of related images or a scene of related action

Result of a Transformation: when one image turns into another; e.g. "I see a beach ball...the beach ball just became a clowns face"

Developed from an Undeveloped Image: when a recognizable image developes from an unrecognizable image; i.e. "I see something rather like a floating half circle, oh, now I can see that it is a dome of a church"

Spontaneous: an image about which you have no idea why it occurred and which is unrelated to other imagery

DURATION:

Fleeting: a brief image which quickly appears and disappears

Persistent: an image which stays in the mind awhile

Recurrent: an image which appears several times throughout the session

CLARITY:

Undeveloped: an image which is unrecognizable; its features are describable in terms of pure form (including geometric forms); i.e ."I see several straight lines intersecting eachother, rather like a Y with several tops" Note: it may be useful to make sketches of such imagery; this category may also refer to an idea or thought which never developes into an image, i.e. "I have a thought of a frog, but I´m not seeing one"

Detailed: an image which is very clearly defined in terms of lines and shapes; this image may be either hallucinatory or dream-like, or be as clear as you would expect it to be using normal vision

Intense Colour: an image which has quite bright and vivid colouration

CONTENT:

<u>Bizarre</u>: an image which contains an unusual combination of elements; i.e. "I see a green and purple striped strawberry"

<u>Personal Memory or Experience</u>: an image which related to a personal memory or a personal experience

MISCELLANEOUS:

<u>Auditory</u>: an image which had an auditory content; i.e. "I hear many voices in conversation as one might at a party" or "I just heard the word, ´frog´"

<u>Physical Sensation</u>: a sense of experiencing some form of physical sensation which may or may not be related to an image; i.e. "I feel as if I´m floating"

<u>Physical Reaction</u>: when one does experience an actual physical response to an image; i.e. "that image actually caused my body to jump in the chair"

APPENDIX 8

Pre- and Post-Session Subject and Agent Questionaires Used in Exp. III

Pre-session Questionnaire (for both the subjects and the agent)

Just a few short questions. Please answer each question by placing a cross somewhere on the line shown. The nearer to one end or other of the line your cross is, the greater the emphasis on your reply.

1. How physically relaxed do you feel right now?
0=very tense; 99=very relaxed
0|--------------------------------------------|99

2. What is your general mood like right now?
0=very bad; 99=very good
0|--------------------------------------------|99

3. How would you describe your expectation of success on the ESP task right now?
0=very doubtful ESP will occur; 99=completely certain ESP will occur
0|--------------------------------------------|99

4. How motivated are you for success on the ESP task right now?
0=not motivated at all; 99=strongly motivated
0|--------------------------------------------|99

Subjects´ Post-session Questionnaire

A few more questions. As before, please answer each question by placing a cross somewhere on the line shown. The nearer to one end or other of the line your cross is, the greater the emphasis on your reply.

1. How physically relaxed do you feel right now?
0=very tense; 99=very relaxed
0|--------------------------------------------|99

2. What is your general mood like right now?
0=very bad; 99=very good
0|-----------------------------------------|99

3. How would you describe your feeling of success on the ESP task right now?
0=very doubtful ESP occurred; 99=completely certain ESP occurred
0|-----------------------------------------|99

4. How would you characterize the quality of your mental activity whilst in the ganzfeld?
0=structured, rational, directed; 99=spontaneous, dreamlike, bizarre
0|-----------------------------------------|99

5. How pleasant was your experience in the ganzfeld?
0=very unpleasant; 99=very pleasant
0|-----------------------------------------|99

6. How successful was the ganzfeld in altering your state of consciousness?
0=not very successful; 99=very successful
0|-----------------------------------------|99

Post-Session Agent Questionnaire

1. How physically relaxed do you feel right now?
0=very tense; 99=very relaxed
0|-----------------------------------------|99

2. What is your general mood like right now?
0=very bad; 99=very good
0|-----------------------------------------|99

3. How alert were you during the sending period?
0=not alert at all; 99=very alert
0|-----------------------------------------|99

4. How would you describe your feeling of success on the ESP task

right now?

0=very doubtful ESP occurred; 99=completely certain ESP occurred

0|-----------------------------------------|99

5. How much did you like this target?

0=completely disliked; 99=completely liked

0|-----------------------------------------|99

6. How pleasant was this sending period?

0=very unpleasant; 99=very pleasant

0|-----------------------------------------|99

7. For what portion of the session were you concentrating on the target picture (eg. paying more attention than 'blankly looking' at the target).

0=none of the sending period; 99=all of the sending period

0|-----------------------------------------|99

8. How aware were you of the identity of any of the other pictures in this particular target set?

0=not aware at all; 99=very aware

0|-----------------------------------------|99

APPENDIX 9

The List of Agent Mentation Categories (characteristics of the agent´s thoughts and/or mental images) for Exp. III

1. Blankly: the agent was looking at the target, but had no particular thoughts passing through her mind, and therefore, was making no mentations
2. Sending: the agent was actively trying to send the target to the subject
3. Vision: the agent was looking at the described item
4. Imagery: the agent was experiencing mental imagery
5. Thinking: the agent was aware of thinking about the mentation item
6. Detail: the agent was concentrating on a detail of the target picture
7. Overall: the agent was concentrating on the whole of the target picture
8. General Association: the item content had a general, consensual associative connection to the target
9. Personal Association: the intem content had an associative connection to the target which was personal to the agent
10. Non-Target: the mentation had nothing to do with the target indicating that the agent´s attention was temporarily diverted away from the target
11. Shape: the shape of an object contained in the target was particularly noticed
12. Colour: the colour of an object was particularly noticed
13. Emotion: the item conveyed an emotional response of the agent
14. Motion: the item conveyed a sense of motion
15. Auditory: the item had an auditory component
16. Sensation: the item conveyed a sensation
17. Experiential: the agent physically experienced the item
18. Fleeting: the agent experienced the item very briefly
19. Persistent: the item remained in the agent´s mind for a relatively long period
20. Recurrent: the item occurred to the agent more than once
21. Detailed: a mental image or thought was quite clear and/or

detailed

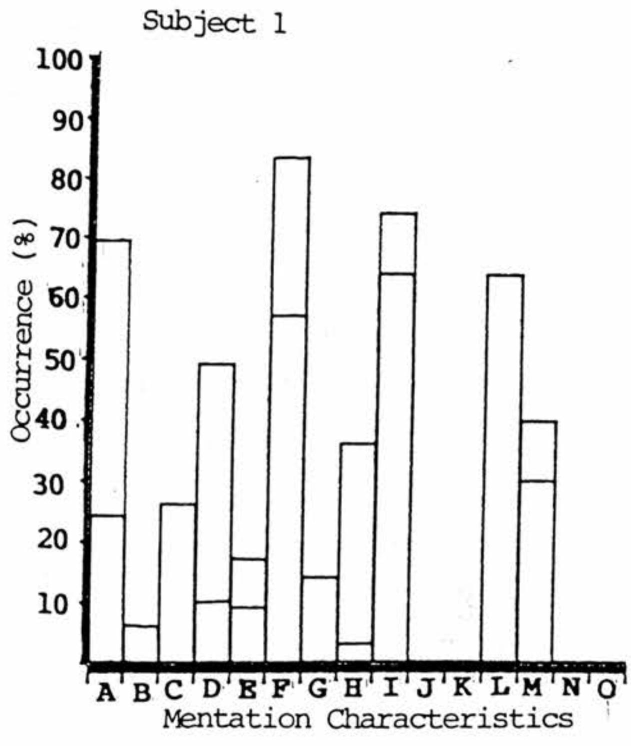
22. Vague: a mental image or thought was unclear and/or vague
23. Spontaneous: a mental image or thought occurred spontaneously, with no relation to the agent´s on-going stream of consciousness
24. Interruption: the item interrupted the agent´s an on-going stream of consciousness
25. Bizarre: the mentation item contained a bizarre, unusual element

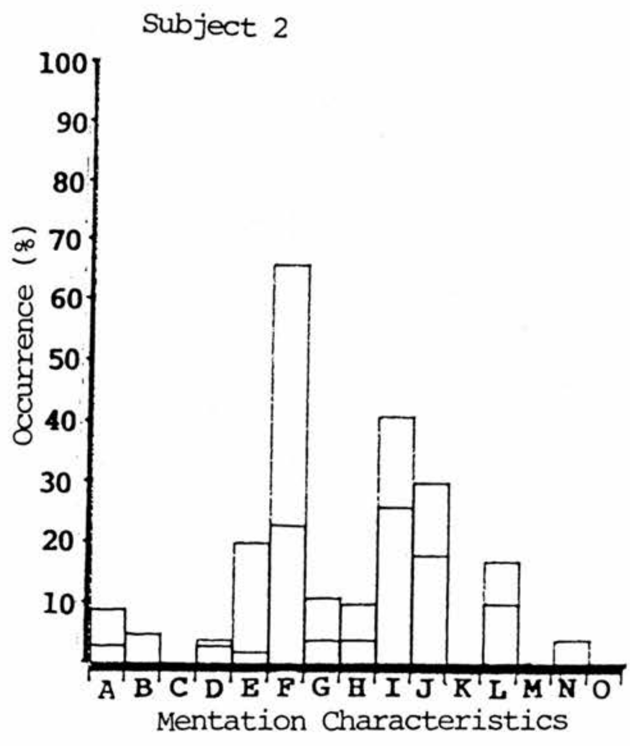
APPENDIX 10

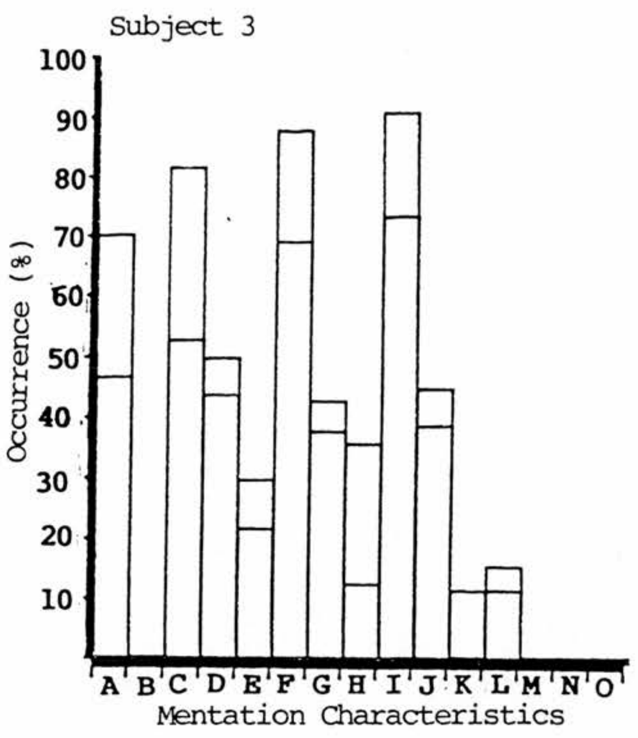
Histograms displaying the frequency of occurrence (expressed as a percentage of all mentations) of the subjects' mentation characteristics (individual histograms for each subject showing frequency from their first and second sessions)

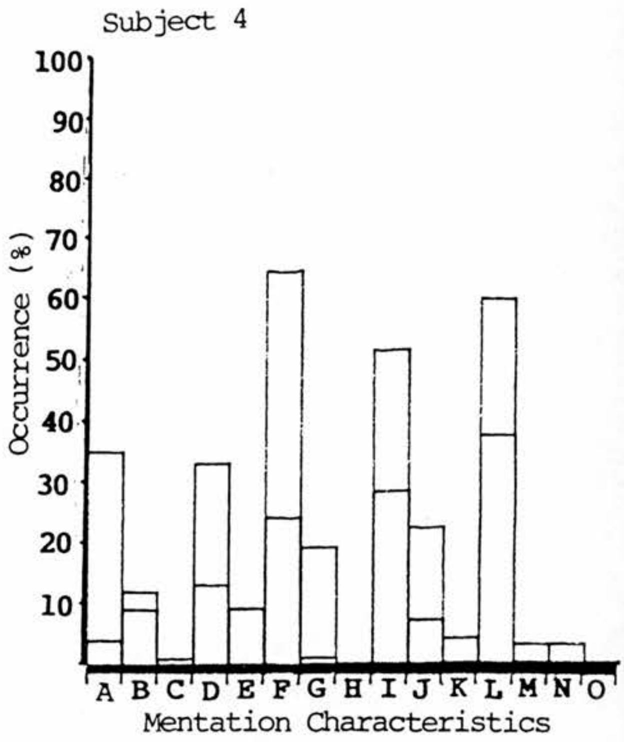
Key for mentation characteristics:

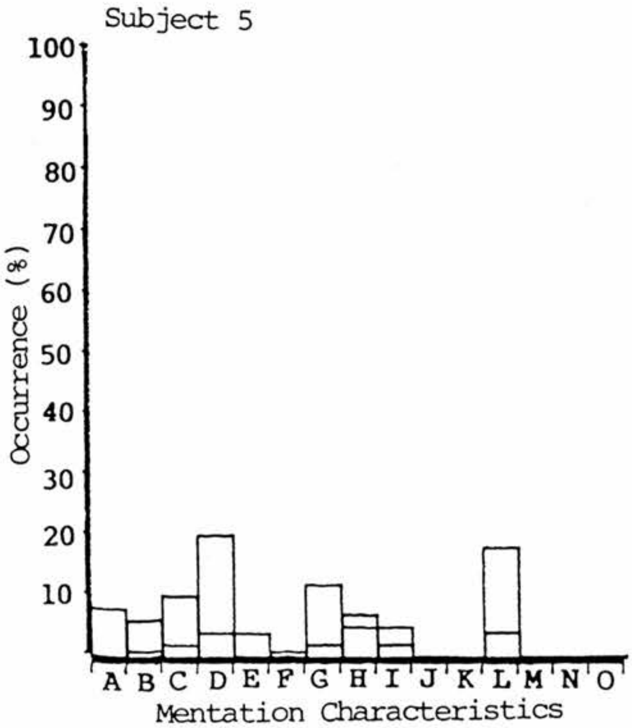
A = Image interrupted on-going thoughts
B = Image transformed from another image
C = Image developed from unclear imagery
D = Imagery appeared spontaneously
E = Imagery was fleeting
F = Imagery was persistent
G = Imagery was recurrent
H = Imagery was undeveloped, vague
I = Imagery was detailed, clear
J = Imagery was intensely coloured
K = Imagery was bizarre
L = Imagery related to a personal memeory
M = Auditory imagery was experienced
N = Imagery suggested a physical sensation
O = Imagery prompted a physical response

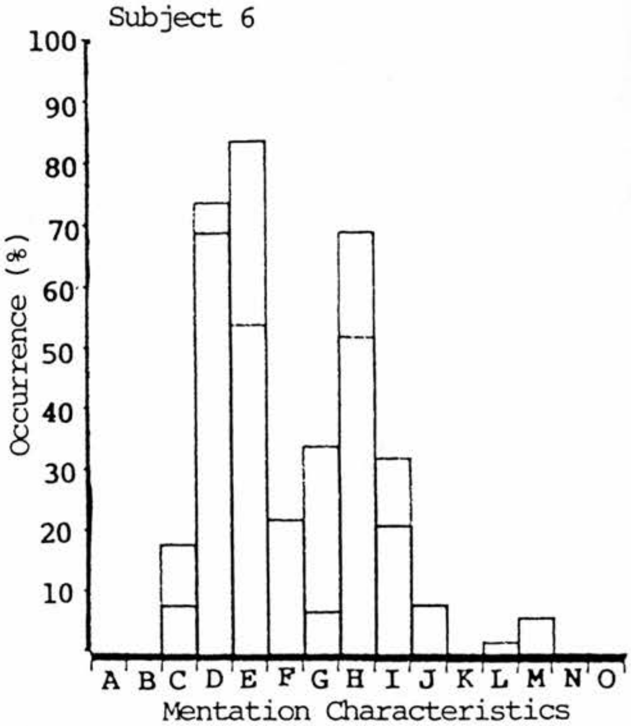


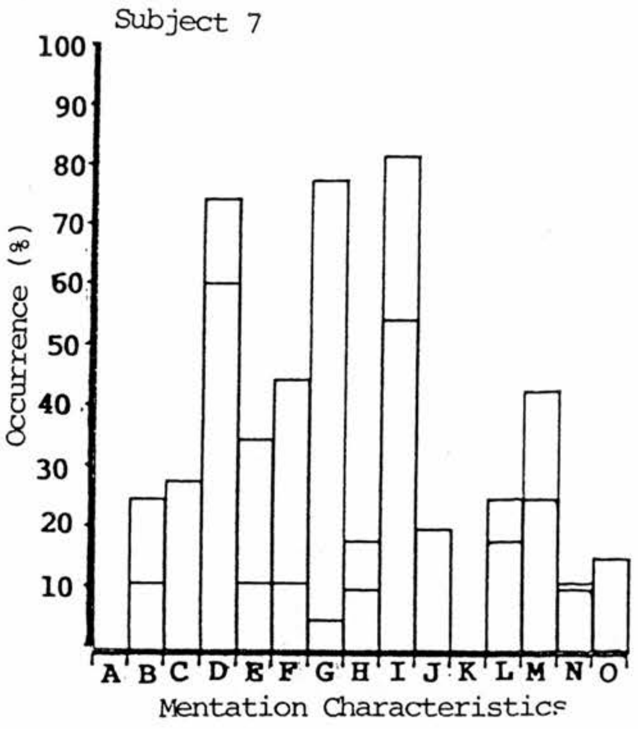



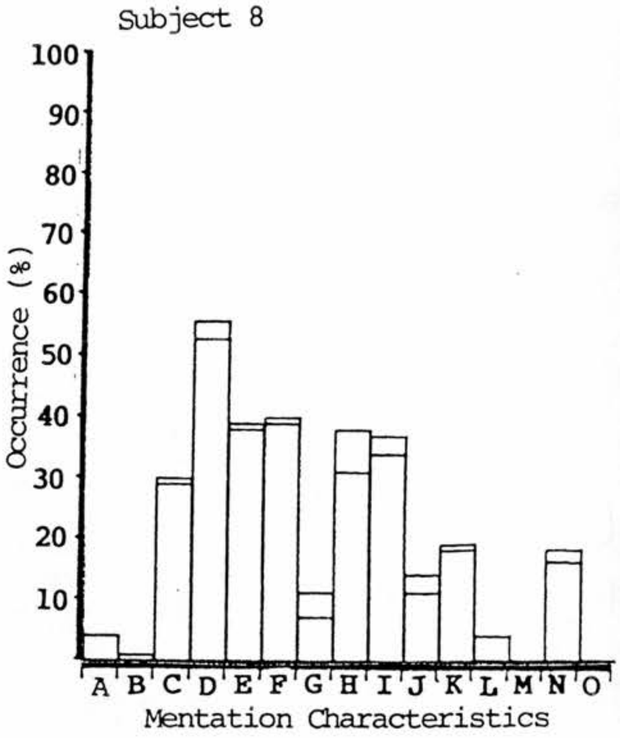

Subject 3
100
90
80
70
60
50
40
30
20
10
Occurrence (%)
A B C D E F G H I J K L M N O
Mentation Characteristics

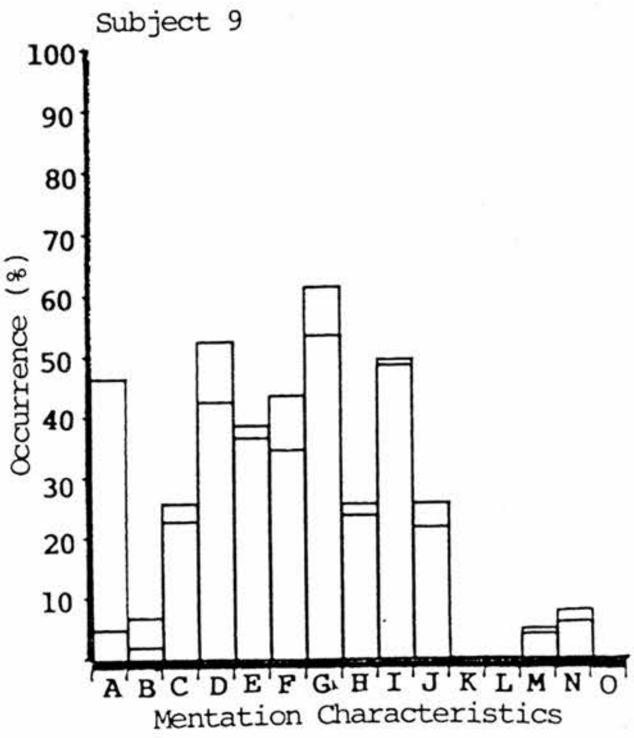

Subject 4
100
90
80
70
60
50
40
30
20
10
Occurrence (%)
A B C D E F G H I J K L M N O
Mentation Characteristics

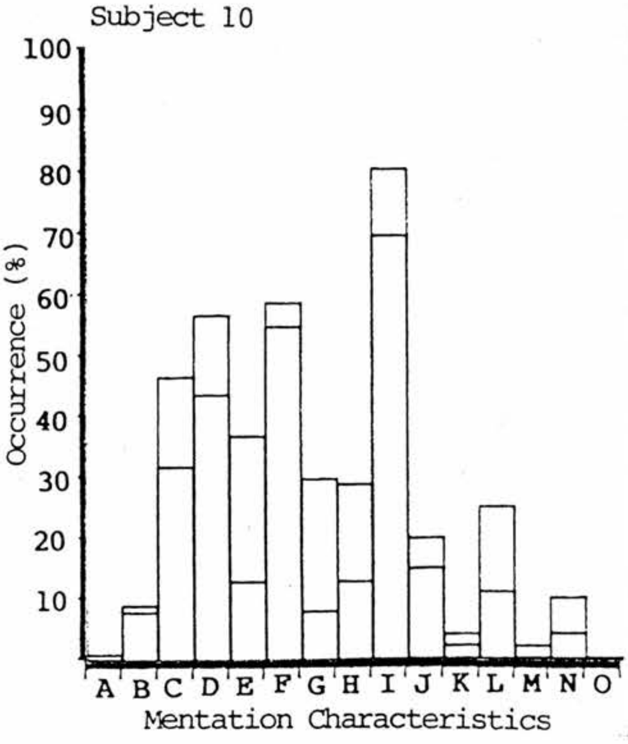

Subject 5
100
90
80
70
60
50
40
30
20
10
Occurrence (%)
A B C D E F G H I J K L M N O
Mentation Characteristics


Subject 6
100
90
80
70
60
50
40
30
20
10
Occurrence (%)
A B C D E F G H I J K L M N O
Mentation Characteristics


Subject 7
100
90
80
70
60
50
40
30
20
10
Occurrence (%)
A B C D E F G H I J K L M N O
Mentation Characteristics


Subject 8
100
90
80
70
60
50
40
30
20
10
Occurrence (%)
A B C D E F G H I J K L M N O
Mentation Characteristics


Subject 9
100
90
80
70
60
50
40
30
20
10
Occurrence (%)
A B C D E F G H I J K L M N O
Mentation Characteristics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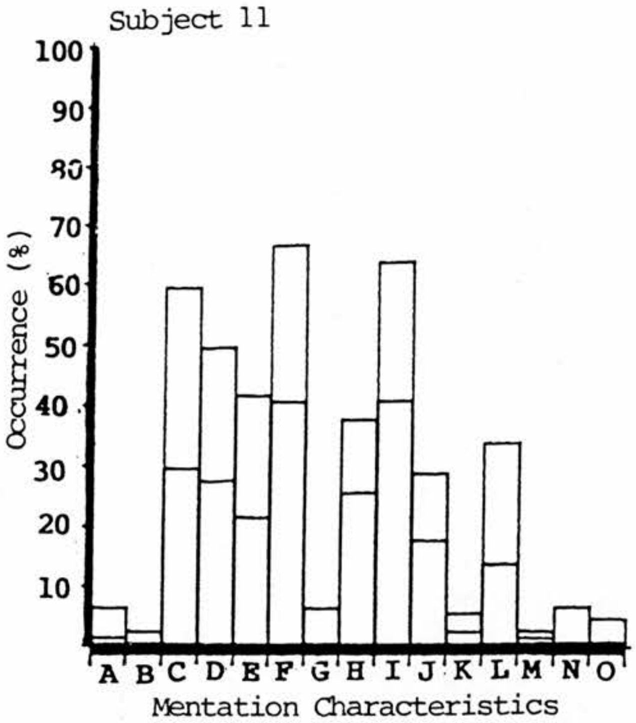
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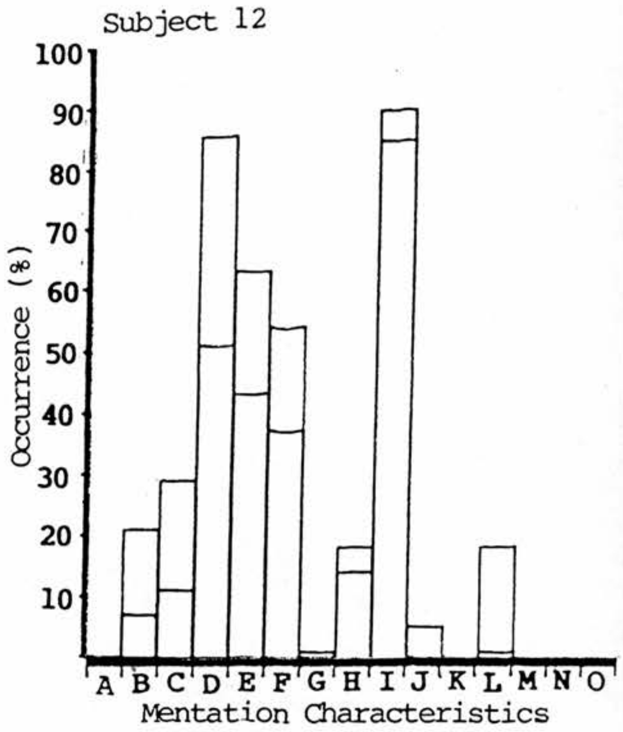
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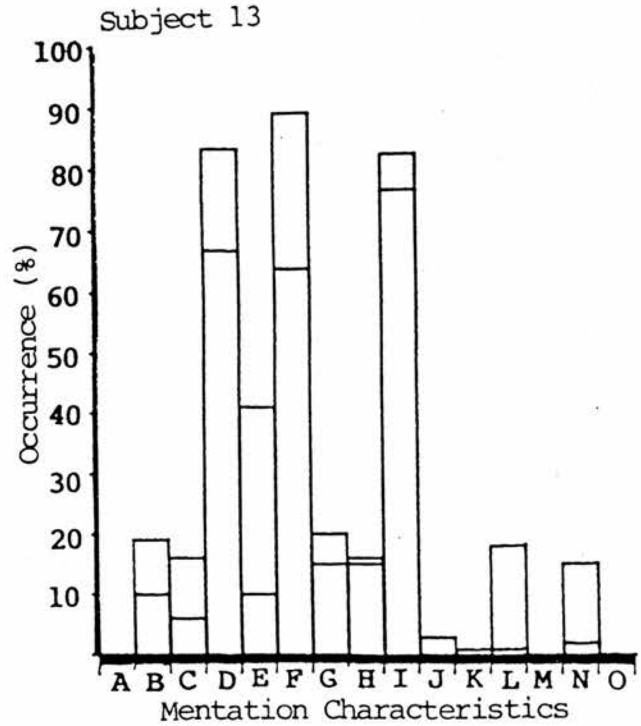
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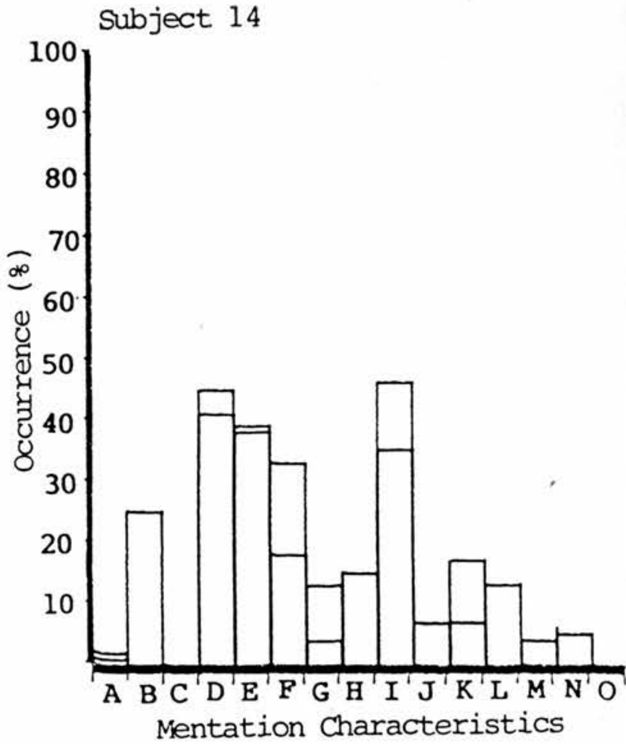
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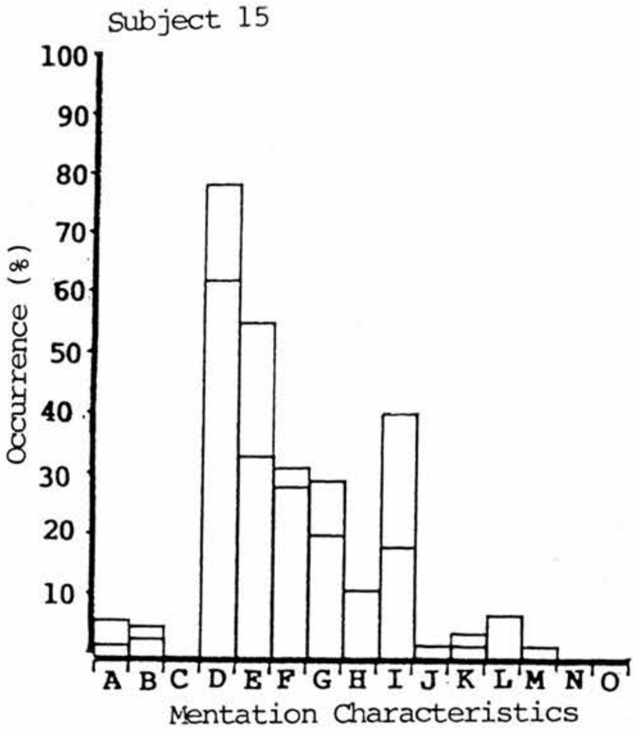
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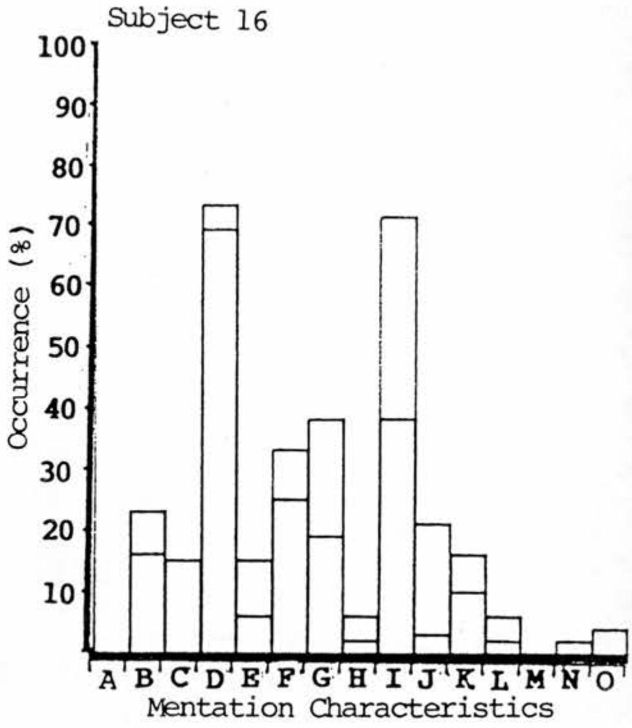
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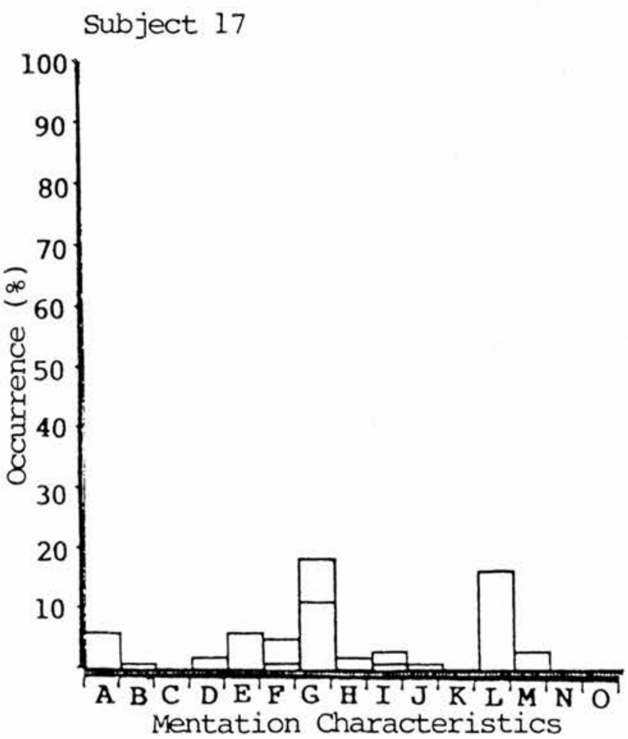
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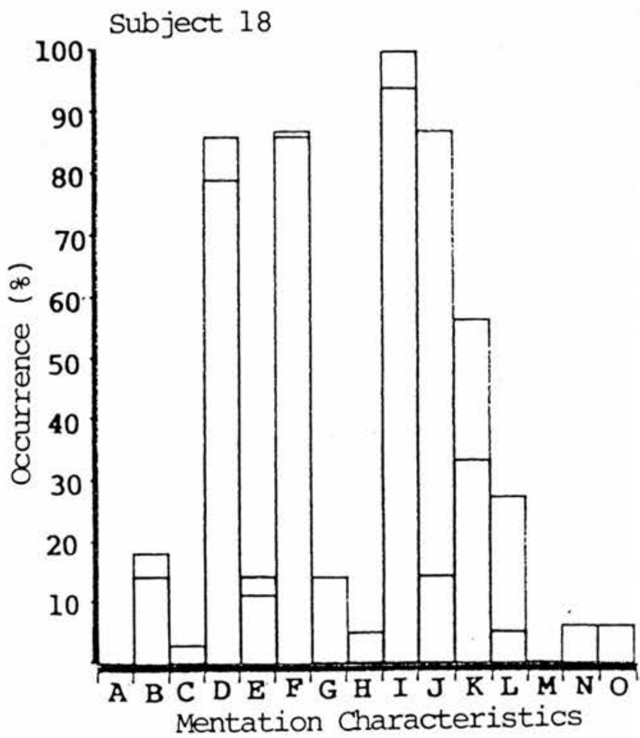
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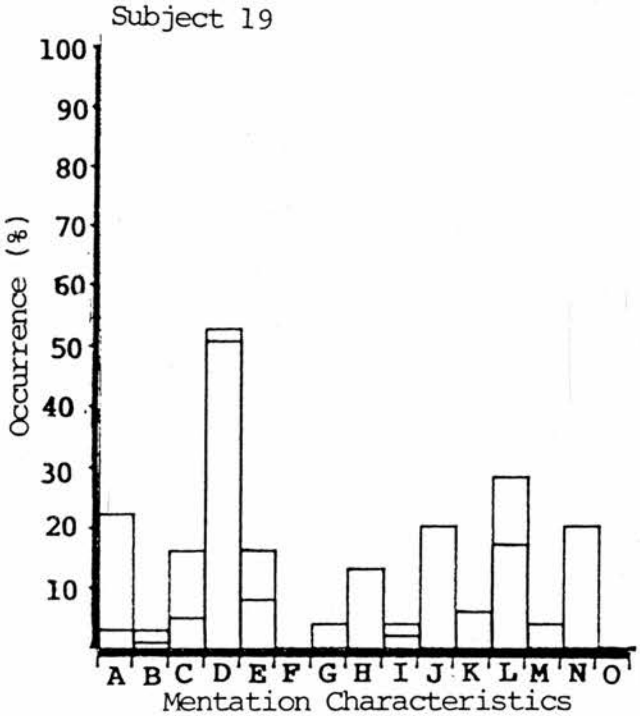
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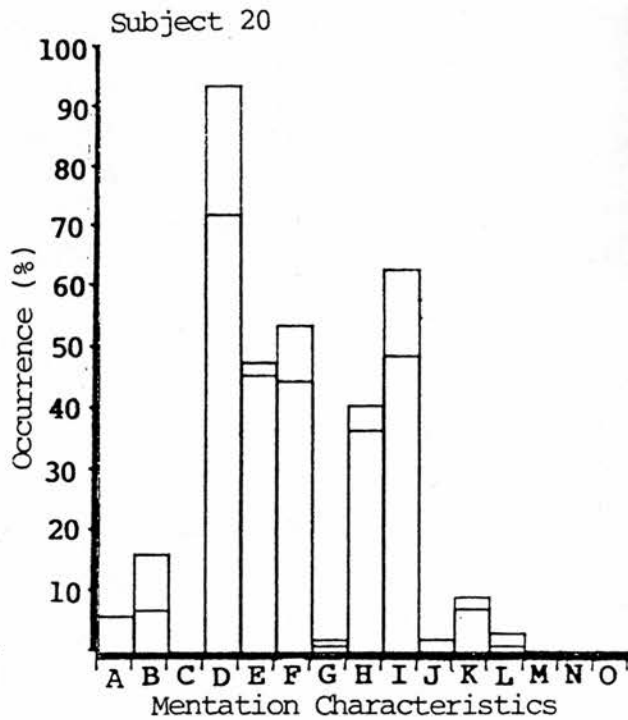
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Mentation Characteristics

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