
Is There a Formula to Success in the Ganzfeld? Observations on Predictors of Psi-Ganzfeld Performance

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Abstract: In order to understand the apparent psi conducive experimenter factors at work in ganzfeld research, it is first necessary to understand what other factors may also come into play that could be considered 'psi conducive'. Included in these factors are physical variables, participant characteristics, and the social setting of the ganzfeld, as well as successful techniques used by experimenters to enhance the performance level of their participants. This report builds on a panel presentation on psi conducive experimenter practices during the 1996 annual parapsychology convention, and presents an exploration of the characteristics and variables indicated by past ganzfeld research to contribute to the success of the ganzfeld technique.

Introduction

Given the increased interest in ganzfeld-psi engendered by the publication of the Bem and Honorton (1994) paper, and the effects of the increasing strength and consistency of recent ganzfeld research, perhaps the most important question one can ask of the ganzfeld technique is, 'What have we learned about reliably predicting psi performance in the ganzfeld?' Observations made from my own experimental work, and that of other ganzfeld researchers, have led me to speculate on the factors that may contribute to achieving a successful result in a ganzfeld setting. In many aspects, these speculations are also applicable to other kinds of ESP work. To that end, even at this early stage of examining the data, several observations can be made.

The ganzfeld research at Psychophysical Research Laboratories (PRL) by Honorton and his colleagues was aimed, in part, at identifying those characteristics that seemed to facilitate psi success in the ganzfeld. Since the PRL series there have been many replications of its successful results (a 33% hit rate overall), many of which were in themselves quite successful (Broughton & Alexander, 1995; Dalton, 1994; Johansson &

Parker, 1995; Morris, Cunningham, McAlpine & Taylor, 1993). The ganzfeld technique as applied to parapsychology originally grew out of research attempting to identify factors that seemed to facilitate successful identification of psi material, that then led to the development of a noise reduction model involving perceptual. This identification of psi facilitative factors is ongoing in psi research.

The relationship between ESP performance and individual differences in psychological traits has been examined in many studies since the 1940s. Numerous variables have been explored, and it appears that several may be consistent in their predictive value (Braud, 1977; Honorton, 1977; Rhine, 1955). In examining the various bodies of ganzfeld research that have been done over the last decade or so, there seems to be a pattern emerging, one that may indicate a formula for success, and that may be translatable to other ESP research. It is hoped that it will not be viewed as premature to list these variables here. They are presented as factors for consideration and exploration in future ganzfeld studies. As levels of importance may vary with study design, the variables are not listed here in order of importance.

PRL Four Factor Model

One of the primary goals of the ganzfeld research at PRL was to identify individual differences and characteristics associated with successful ESP ganzfeld performance. Although PRL's initial model of the four factors facilitating ganzfeld success was directed at novices only (inexperienced ganzfeld participants), it continues to be used as a successful profile for identification of those participants most likely to achieve success in a ganzfeld setting. The four factor model (Honorton, 1992) consists of: previous psi experiences; practice of a mental discipline; prior laboratory psi testing; and Feeling/Perception (FP) preferences on the Myers Briggs Type Inventory (MBTI). Let us address each of these briefly, in turn.

The first factor is that of having had prior psi experiences. It can be argued that participants who have had prior psi experiences may be better at recognizing the psi material when it appears in the ganzfeld. These participants have consistently tended to produce higher rates of success than those who have not had psi experiences (Bierman, Bosga, Gerding & Wezelman, 1993; Broughton, Kanthamani & Khilji, 1990; Honorton, 1985, 1992; Honorton *et al.*, 1990; Honorton & Ferrari, 1989; Kanthamani & Broughton, 1994; Morris *et al.*, 1993; Morris, Dalton, Delanoy & Watt, 1995).

The second factor is the practice of a mental discipline, such as meditation or bio-feedback. This factor's success may be because these participants are accustomed to attending to internal mental processes and are therefore more familiar with internal sources of noise, making the psi information more easily recognizable when it appears (Bem & Honorton, 1994; Bierman *et al.*, 1993; Broughton *et al.*, 1990; Honorton, 1985, 1992; Honorton *et al.*, 1990; Kanthamani & Broughton, 1994; Morris *et al.*, 1993; Morris *et al.*, 1995).

The third factor presented by the PRL model is that of having prior laboratory psi testing, other than the ganzfeld (Bem & Honorton, 1994; Honorton, 1992; Honorton

& Schechter, 1987; Kanthamani & Broughton 1994; Morris *et al.*, 1993; Morris *et al.*, 1995). This variable is harder to find in most populations, as often their participation in the ganzfeld is the first encounter with laboratory psi testing of any type. The reason for the success of this variable may relate directly to the participant's prior familiarity with the laboratory environment before entering what may be a fairly unusual and bizarre situation (red lights and ping pong ball eyeshields). This prior familiarity with the lab environment would lead to a reduction of the stress or anxiety typically caused by entering a potentially threatening or unknown situation. Linked with this point is the use of experienced participants in ganzfeld research. Experienced participants are those who have had a prior ganzfeld session and therefore know what to expect from the experience. Ganzfeld research with experienced participants seems to produce a higher success rate than research designs using only novices, or inexperienced participants (Honorton *et al.*, 1990; Sargent, 1980; Sargent, Bartlett & Moss, 1982). Again, this response may be related to the higher degree of comfort and familiarity with a procedure that initially may seem strange or bizarre for the participant. This familiarity may contribute to the participant's ability to relax in a 'safe' environment and facilitate a deconstruction of psychological barriers.

The last factor put forth by the PRL model is that of Feeling/Perception (FP) preferences on the Myers-Briggs Type Indicator (MBTI). The description of the FP respondent on the MBTI is someone who is flexible & adaptable, has interpersonal sensitivity, seeks new experiences, and analyzes subjective activity. The superior performance of FP's may be related to their adaptability to new situations and motivation for new experience. An evaluation of the MBTI in relation to the five factor model of personality (McCrae & Costa, 1989; Costa & McCrae, 1992) by Honorton (1992) indicated that the Thinking/Feeling (TF) scale of the MBTI correlated positively with Agreeableness and the Judging/Perceiving

(JP) scale correlated negatively with Conscientiousness (i.e., orderliness) and positively with Openness to Experience (Bem & Honorton, 1994; Broughton *et al.*, 1990; Honorton & Schechter, 1987; Honorton *et al.*, 1990, Kanthamani & Broughton, 1994). The studies of van Kampen, Bierman, & Wezelman (1994) and Broughton & Alexander (1995) found positive correlations between psi hitting and the Openness scale of the NEO-PI (a personality scale using the five factor model devised by Costa & McCrae, 1985) in their ganzfeld studies. However, this trend was not exhibited in a follow-up study by Bierman (1995).

Additional Variables

Participant Characteristics

In addition to the four factors proposed by the PRL research, additional variables have emerged from more recent ganzfeld research that seem to indicate a greater measure of success for study designs taking them into account.

The first of these of variables is that of psi belief. Participants who relate a belief in psi, or in the possibility of psi, show a higher success rate than those who relate no such belief (Broughton, Kanthamani & Khilji, 1990; Honorton, 1985; Honorton *et al.*, 1990; Honorton & Schechter, 1987; Morris *et al.*, 1993; Morris *et al.*, 1995). This finding is, of course, linked to the sheep/goat effect and is fairly consistent throughout the parapsychological literature. For a meta-analytic review of the sheep/goat effect, see Lawrence (1993).

A second variable found to facilitate psi success in the laboratory, as well as in the ganzfeld, is that of extroversion (Honorton & Ferrari, 1989; Honorton, Ferrari & Bem, 1990; Morris *et al.*, 1993; Schlitz & Honorton, 1992; van Kampen *et al.*, 1994). However, this variable is somewhat debated (Bierman *et al.*, 1993; Broughton *et al.*, 1990; Dalton & Utts, 1995; Morris *et al.*, 1995) as extroverts are those people who generally feel at ease in most social situations and enjoy interactions with groups of people, and would

thus feel more relaxed in the social setting of the laboratory. Introverts typically prefer to work alone, finding most social interactions with more than one person overwhelming and uncomfortable. For this reason it is felt that introverts may do as well as extroverts in ganzfeld research if some way were found to provide a more conducive social setting for them – one in which they were not required to speak aloud about normally private thoughts, or interact with more than one person throughout the experiment. An examination of the extroversion/introversion research by Honorton and Schechter (1987) in the PRL work showed that while extroverts tended to produce more hits for that database, there was a significant tendency for extroverts to obtain hits with friends sending, while introverts tended to hit with lab senders.

Another variable that has emerged as a characteristic indicating a higher rate of psi success for the participants possessing this trait, is that of creativity (Braud & Loewenstern, 1982; Moriarty & Murphy, 1967a, 1967b; Morris *et al.*, 1993; Moss, 1969; Moss & Gengerelli, 1968; Schlitz & Honorton, 1992). Creative populations, such as musicians or artists, have produced fairly high success rates in recent ganzfeld research and creativity continues to be an area that shows great promise in contributing to our understanding of psi communication in the ganzfeld (Dalton, 1997; Morris *et al.*, 1995). A ganzfeld study using Juilliard School of the Arts students produced a 50% hit rate overall, with musicians alone obtaining a 75% hit rate and drama students a 40% hit rate (Schlitz & Honorton, 1992). Cunningham (Morris *et al.*, 1993) obtained a 41% hit rate in her study with pairs of musicians at the University of Edinburgh. Ganzfeld research recently completed at the University of Edinburgh using an artistic population consisting of visual artists, musicians, actors, and writers yielded an overall hit rate of 47% (Dalton, 1997). Once again, musicians were the high-scoring group in the study, obtaining a hit rate of 56%. It seems clear from these studies that creativity is a vari-

able that warrants further investigation in future ganzfeld studies.

Characteristics of the participant's environment

The previous variables are characteristics or traits associated with participants in ganzfeld research that have indicated a greater likelihood of success for those possessing them. But there are other, equally important, factors outside of participant characteristics that should be taken into consideration when exploring successful designs for the ganzfeld.

The first of these is the relationship between the sender and receiver. The importance of this relationship is fast becoming clear, with sender/receiver pairs who are close friends or family having the edge over pairs where the sender is laboratory staff, or someone the receiver had not been acquainted with before coming into the lab (Dalton, 1997; Honorton, 1995; Honorton *et al.*, 1990; Morris *et al.*, 1993). While it is always important that the sender and receiver feel they have good rapport with each other (Dalton & Utts, 1995; Honorton *et al.*, 1990), recent research has indicated that the psi connection seems best between pairings who are biologically and emotionally close. Broughton and Alexander compared the PRL database to their work with such pairings (Broughton & Alexander, 1995). They found that parent-child pairs, or sibling pairs, provided higher hit rates than other, non-biologically related pairings. This finding was confirmed in the Dalton (1997) ganzfeld study.

A second variable to consider is the type of target material used in ganzfeld studies. Early ganzfeld studies used static, or still targets, such as art prints or pictures. Later, the target material progressed to viewmaster slides or projector slides with music. PRL first began the use of dynamic, or moving, targets in their automated ganzfeld series (Honorton, 1985; Honorton & Schechter, 1987; Honorton *et al.*, 1990). This target pool consisted of video clips with accompanying sound track inter-

persed on a video tape with successful static targets from previous studies. These dynamic targets enjoyed a large degree of success but it also appears that the impact of sender/receiver relationship on target type plays a role (see Dalton & Utts, 1995 for further discussion). Additionally, in comparisons of targets comprised of negative, positive, or neutral material, people were able to pick up on the material containing either a negative or positive impact to a far greater degree (Bierman, 1995; Dalton, Steinkamp & Sherwood, 1996; Honorton *et al.*, 1990). Therefore, the type of target stimuli used should be chosen carefully, to allow participants the best opportunity of picking up on it. Given what appear to be differences in the way that participants experience the reception of the psi information, and the relevance of meaningfulness of the target for the participant – which can be impacted by cultural and social factors – no universally 'perfect' free-response target can be defined. Recent reviews of the characteristics of successful free-response targets suggest that good GESP targets should be psychologically and physically salient. They should be meaningful, have emotional impact and human interest; and stand out from their backgrounds (Delanoy, 1988; May, Spottiswoode & James, 1994; Watt, 1988).

The third variable is one that apparently affects both the experimenter conducting the sessions as well as the participants involved, namely that the number of sessions conducted per day may affect the success of a ganzfeld study. Research in which two or three sessions, with different sender/receiver pairs, were conducted in one day saw a drastic reduction in the success rates for each session after the first (Sondow, 1979; Morris *et al.*, 1995). This may be the result of a certain amount of both physical and mental wear and tear on the participants as well as experimenters, especially as the experimenter is expected to be energetic, positive and enthusiastic for every session, and sessions can last anywhere from one up to three or four hours (Honorton, 1992; Morris *et al.*, 1995).

We have already discussed the significance of the sender/receiver relationship, but it appears that the gender of the sender/receiver pairs may also play a role. In post hoc analyses (Dalton, 1994) performed on the ganzfeld data from PRL, as well as the ganzfeld data from the studies of Cunningham (Morris *et al.*, 1993), Dalton (1994), and Schlitz & Honorton (1992), the mixed gender pairings of male receiving and female sending seemed to produce more hits, followed by the mixed gender pairing of female receiving and male sending. The gender pairing that appeared to produce the fewest direct hits was that of male/male. This pattern was also found, in post hoc analyses, in the ganzfeld research of Willin (1996) and Zingrone (1994). There is also supporting evidence for this pattern of gender relationship in social sciences research focusing on problem solving and gender pairings (Anderson & Blanchard, 1982; de Angelis, 1987; Rumerick, Capasso & Hendrick, 1977; Shepard, 1981; Wood, 1987).

Finally, we come to what I feel are the two most important attributes associated with success in the ganzfeld. These are the expectations of success generated by the experimenter, and the social setting in which the ganzfeld takes place. The critical nature of these two items to the success of the ganzfeld is becoming more apparent (Dalton *et al.*, 1994; Honorton, 1992; Schlitz & Honorton, 1992) and will be discussed in some depth here.

Early in the history of parapsychology, Rhine produced several very insightful recommendations about characteristics of psi success. Rhine (1955) felt that exceptional psi performance represented a combination of conditions within and around the subject, conditions that favoured the functioning of psi to an exceptional degree and might only continue for a limited period of time. Schmeidler (Rao, 1982) writes of Rhine's attempts to find conditions conducive to PK and ESP in the person being tested. He felt that these might involve a combination of alertness and detachment, a relaxation of all sensory functions and abstraction from all sense-stimuli, effortless, striving, motivation

(in terms of money, kindness, play or display); self-control, capacity for attention, confidence, patient persistence, effort and voluntary attention, easy informality, tendencies to daydreaming, high imaginativeness, artistic ability, hypnotizability and sociability. The types of things he felt to be psi inhibiting included distraction, fatigue, haste, strain, self-consciousness, an unwelcome change in procedure or inhibiting procedures, doubt/negativism, monotony, and drowsiness. His observations also included a prescription for experimenters for successful elicitation of psi in the lab. This included expressing no doubt; showing playful informality and light humour; encouragement; employing short runs; stopping before participants are tired of the task; not giving extravagant insincere praise; and varying procedures to avoid boredom. In short, the type of approach that makes for effective salesmanship in any area.

The social context in which the ganzfeld takes place makes it unlike the types of experiments that take place in other sciences, say for example, physics. For parapsychological research, it is perhaps more important that we try to understand those kinds of environments, personalities, and social situations that are conducive to the psi process, and less important that this research be built along a physics kind of model.

The nature of the social setting of the ganzfeld creates an intimate situation, and it is likely that various aspects of the testing environment may intensify or mitigate this intimacy. Human beings are vulnerable, particularly so in situations such as the ganzfeld or dream research where their normal anchors to reality are removed (Honorton *et al.*, 1990; Honorton & Ferrari, 1989; Honorton, Ferrari & Bem, 1990). So, unless participants are able to feel safe and comfortable with the experimenter, and unless the experimenter can give them some motivation to be successful in the task they are there to do, there is basically no reason to expect success. Building mutual trust in the ganzfeld, and other kinds of psi research, seems to be crucial to its success

(White, 1977). The participant must be willing to relax and open their mind to impressions, and not be preoccupied with anxiety producing thoughts, such as the idea of being cut off from their normal sensory apparatus, or having what they say be evaluated in some way by the experimenter, or perhaps affecting the experimenter's opinion and good will towards them.

In most experimental situations in parapsychology, participants entering the laboratory generally feel nervous, excited, and may not really know what to expect. In this, I have found, they look to the experimenter for an idea of what to expect from the ganzfeld session. This is the perfect opportunity for the experimenter to set the stage for success, to foster an expectation of success in the task while alleviating any concerns or anxiety the participant may have about the process or the lab situation. Part of this alleviating of concerns or anxieties can be accomplished through conveying a positive attitude on the part of the experimenter about the successful outcome of the session. This includes conveying a sense of excitement and enthusiasm for that task, and support and encouragement for the participant's successful completion of the task. At this point, it is essential that the participant feel that this study, this session, is vitally important. It is advisable that experimenters help participants understand that their contribution is immensely valuable and that their time and involvement in the study is important to the researcher. Participants who do not feel their contribution, or success, in the study is important to the researcher, or who feel that there is little chance in their succeeding, generally live up to these expectations (Honorton, Ramsey & Cabibbo, 1975; Schmeidler, 1988). Thus, a positive attitude concerning successful session outcome, fostering of team spirit, and helping participants to perceive the task as challenging but obtainable is indicated.

Lastly, the fear of psi is an issue that we must all face in psi research. In my own research and in my observations of others, I have seen no better weapon with which to

combat this than humour. A light hearted approach, employing easy and playful informality, seems to be the most successful way to relax the participant and help them be open to accepting success as well as expecting it. This approach also allows the experimenter to perhaps face their own fear of psi, not only in the desire for a successful outcome to the experiment, but also in an absence of resistance to it. Additionally, a team approach helps to dispel the fear of psi by dispersing responsibility for the successful outcome of the session. The ganzfeld is at least partly psychological in nature, with the ritual of the ganzfeld providing the participant with an expectation of success. Thus, the responsibility is no longer on the individual, it has been transferred to the situation. This approach of 'testing the technique rather than the individual' allows participants to avoid being ego-laden with the burden of responsibility or guilt over the successful outcome of the session (Dalton, 1994; Schlitz & Honorton, 1992).

In order to build rapport with participants, and to make them more comfortable with the laboratory environment, parapsychologists employ differing techniques. They may strive to achieve some common ground with participants, by trying to anticipate how participants may feel or think throughout the session, and the types of interpretations that participants may impart to events. Most of us subconsciously observe and assess new people that we meet in order to better communicate with them on a comfortable psychological level. This 'scanning' helps us to assess someone's background, experience and education in order to develop rapport and allow us to 'speak the same language', easing communication of ideas and feelings. By using this technique, by bringing scanning into conscious play with participants, interactions between researchers and participants will be facilitated by increasing psychological comfort and confidence in the technique and in the researchers. In the case of a stereotyped technique, such as the ganzfeld, the technique itself is standardised, but not the message that reaches the person. Scanning allows the researcher to

find the world view and language of each person in order to tailor the details of the experiment in such a way as to make the experiment meaningful to them.

Prior research (Schlitz & Honorton, 1992; Morris *et al.*, 1995) has indicated that an environment of warmth, friendliness and openness helps to convey to the participant a sense of excitement about this research. This sense of excitement can be used to promote the feeling of undertaking a shared adventure, a joint venture with participants into a cutting edge area of science. The chat period before a ganzfeld session is generally used to create a warm, friendly, and open environment within the ganzfeld setting. Since people who come into the laboratory to take part in psi research often have had psi experiences of their own, there may be some anxiety that the researcher, who is often seen as an authority figure on the subject, will view them, or their experiences, as bizarre, crazy or abnormal. While an open and accepting environment does not mean that researchers must, or should, validate whatever experience the participant may have had, it is still important to give them a sense that we recognise that they have experienced something which is meaningful to them. This may be particularly true for ganzfeld research where it is important to help participants put the session's outcome in perspective without an over-interpretation of their experience, allowing them to leave the laboratory feeling positive, yet realistic, about the experience.

Discussion

The variables and observations given here are presented only as guidelines, designed to provide a crude best guess as to optimal characteristics of ganzfeld performance, as shown by recent and past ganzfeld research, and as an informal update to PRL's predictor model (Honorton *et al.*, 1990; Honorton & Schechter, 1987). These findings will either be strengthened or weakened by future ganzfeld studies, and added to or deleted from by further independent replications.

There are other factors for consideration when attempting to outline what may be psi-conducive for the ganzfeld, but which currently do not have sufficient past research support to warrant their inclusion in the foregoing section. I would like briefly to mention a few here. One such factor is that of the relationship of the geomagnetic field to ESP tasks, i.e. psi hitting during times of low geomagnetic activity (Berger & Persinger, 1991; Persinger, 1985, 1989; Persinger & Krippner, 1989; Spottiswoode, 1990). This relationship, low geomagnetic activity and ESP success, is still open to debate, but does have some supporting evidence for ganzfeld-ESP work (Dalton & Stevens, 1996; Radin, McAlpine, & Cunningham, 1994). There are as many camps of reasoning on why this may be so as there are factors that could account for it within the geomagnetic field itself.

The length of the ganzfeld session may also play a role, with the current feeling that sessions that last at least thirty but no more than forty five minutes provide participants with the optimal amount of time to become habituated to the ganzfeld stimulus - thus facilitating psi retrieval - while more time seems to create boredom (Stanford, 1984; Sargent & Matthews, 1982a, Sargent, Bartlett & Moss, 1982).

It has been suggested (Rhine, 1955; Dalton, 1997) that a participant's level of self-confidence also directly influences their ability to perform well in psi tasks. As this variable is particularly difficult to tease out from other participant variables (e.g., sheep/goat effect), research incorporating definitive measures of self-confidence levels is needed to clarify this issue.

It seems clearly indicated that more detailed and systematic refinement of the predictors presented in this paper would be more useful than continued direct replication of the PRL model. As was noted in the conclusion of the 1990 paper on ganzfeld work at PRL (Honorton *et al.*, 1990, p. 136):

Recent psi ganzfeld research has necessarily focused on methodological issues arising from the ganzfeld controversy. It is essential that future

studies comply with the methodological standards agreed upon by researchers and critics. But it is equally imperative that serious attention be given to conditions associated with successful outcomes.

I would like to urge ganzfeld investigators to consider designing studies taking the 'psi-conductive' factors discussed here into account. Actively recruiting participants who conform to as many of the given factors as possible, and striving to incorporate as many of the other 'non-participant' type variables as feasible, may not only enhance the likelihood of successful psi ganzfeld performance, but may also increase our understanding of the psi processes.

References

- Anderson, L.R. & Blanchard, P.N. (1982). Sex differences in task and social-emotional behavior. *Basic and Applied Social Psychology*, 3, 109-139.
- de Angelis, E. (1987). Is it really worth running in the rain? *European Journal of Physics*, 8, 201-202.
- Bem, D.J., & Honorton, C. (1994). Does psi exist? Replicable evidence for an anomalous process of information transfer. *Psychological Bulletin*, 115, 4-18.
- Berger, R.E., & Persinger, M.A. (1991). Geophysical variables and behavior: LXVII. Quieter annual geomagnetic activity and larger effect size for experimental psi (ESP) studies over six decades. *Perceptual & Motor Skills*, 73, 1219-1223.
- Bierman, D.J. (1995). The Amsterdam ganzfeld series III & IV: Target clip emotionality, effect sizes and openness. *Proceedings of the Parapsychological Association 38th Annual Convention*, Durham, North Carolina, 27-37.
- Bierman, D., Bosga D., Gerding H., & Wezelman, R. (1993). Anomalous information access in the ganzfeld: Utrecht - novice series I and II. *Proceedings of the Parapsychological Association 36th Annual Convention*, Toronto, Canada, 192-203.
- Braud, L.W., & Loewenstern, K. (1982). Creativity and psi. *Research in Parapsychology*, 1981. Metuchen, NJ: Scarecrow Press.
- Braud, W. (1977). Psi conducive conditions: Explorations and interpretations. In B. Shapin and L. Coly (Eds), *Psi and States of Awareness*, 221-237. New York: Parapsychology Foundation.
- Broughton, R.S., & Alexander, C.H. (1995). Autoganzfeld II: The first 100 sessions. *Proceedings of the Parapsychological Association 38th Annual Convention*, Durham, North Carolina, 53-61.
- Broughton, R.S., Kanthamani, H., & Khilji, A. (1990). Assessing the PRL success model on an independent ganzfeld base. In L. Henkel & J. Palmer (Eds), *Research in Parapsychology 1989*, 32-35. Metuchen, NJ: Scarecrow Press.
- Costa, P.T. & McCrae, R.R. (1985). *The NEO Personality Inventory Manual*. Odessa, FL: Psychological Assessment Resources.
- Costa, P.T., & McCrae, R.R. (1992). *Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI): Professional manual (Rev. Ed.)*. Odessa, FL: Psychological Assessment Resources.
- Dalton, K. (1994). Report on informal ganzfeld trials and comparison of receiver/sender sex pairing. *Proceedings of the 37th Annual Convention of the Parapsychological Association*, Amsterdam, Holland, 104-113.
- Dalton, K. (1997). Creativity and psi in the ganzfeld. *Proceedings of the 40th Annual Convention of the Parapsychological Association*, Brighton, England, 119-134.
- Dalton, K., Morris, R.L., Delanoy, D., Radin, D., Taylor, R. & Wiseman, R. (1994). Security measures in an automated ganzfeld system. *Proceedings of the Parapsychological Association 37th Annual Convention*, Amsterdam, Holland, 114 - 123.
- Dalton, K., Steinkamp, F. & Sherwood, S. (1996). A dream GESP experiment using dynamic targets and consensus vote. *Proceedings of the 39th Annual Convention of the Parapsychological Association*, San Diego, USA, 57-72.
- Dalton, K. & Stevens, P. (1996). Geomagnetism and the Edinburgh autoganzfeld. *European Journal of Parapsychology*, 12, 23-31.
- Dalton, K. & Uts, J. (1995). Sex pairings, target type, and geomagnetism in the PRL automated ganzfeld series. *Proceedings of*

- the *Parapsychological Association 38th Annual Convention*, Durham, North Carolina, 99-112.
- Delanoy, D. (1988). Characteristics of successful free-response targets: Experimental findings and observations. *Proceedings of the Parapsychological Association 31th Annual Convention*, Montreal, Quebec, 230-246.
- Honorton, C. (1977). Psi and internal attention states. In B. Wolman (Ed.) *Handbook of Parapsychology*, 435-472. Jefferson, North Carolina: McFarland and Company, Inc.
- Honorton, C. (1985). Meta-analysis of psi ganzfeld research: A response to Hyman. *Journal of Parapsychology*, 49, 51-91.
- Honorton, C. (1992). The ganzfeld novice: Four predictors of initial ESP performance. *Proceedings of the Parapsychological Association 35th Annual Convention*, Las Vegas, Nevada, 51-58.
- Honorton, C. (1995). Impact of the sender in ganzfeld communication: Meta-analysis and power estimates. *Proceedings of the Parapsychological Association 38th Annual Convention*, Durham, North Carolina, 132-140.
- Honorton, C., & Ferrari, D.C. (1989). Future Telling: A meta-analysis of forced-choice precognition experiments, 1935-1987. *Journal of Parapsychology*, 53, 281-308
- Honorton, C., Ramsey, M. & Cabibbo, C. (1975). Experimenter effects in extrasensory perception. *Journal of the American Society for Psychical Research*, 69, 135-149.
- Honorton, C. & Schechter, E. (1987). Ganzfeld target retrieval with an automated testing system: A model for initial ganzfeld success. In D.H. Weiner & R.D. Nelson (Eds) *Research in Parapsychology 1986*, 36-39. Metuchen, NJ: Scarecrow Press.
- Honorton, C., Berger, R., Varvoglis, M., Quant, M., Derr, P., Schechter, E. & Ferrari, D. (1990). Psi communication in the ganzfeld: Experiments with an automated testing system and a comparison with a meta-analysis of earlier studies. *Journal of Parapsychology*, 54, 99-139.
- Honorton, C., Ferrari, D.C., & Bem, D.J. (1990). Extraversion and ESP performance: A meta-analysis and a new confirmation. *Proceedings of the Parapsychological Association 38th Annual Convention*, Las Vegas, NV, 113-125.
- Johansson, H. & Parker, A. (1995). Replication of the ganzfeld findings: Using a simplified ganzfeld procedure. *Proceedings of the Parapsychological Association 38th Annual Convention*, Durham, North Carolina, 156-160.
- Kampen, D. van, Bierman, D., & Wezelman, R. (1994). Personality and psi: Unravelling relations between extraversion, agreeableness and openness to experience with ganzfeld performance. *Proceedings of the Parapsychological Association 37th Annual Convention*, Amsterdam, Holland, 175-181.
- Kanthamani, H., & Broughton, R. (1994). Institute for Parapsychology ganzfeld-ESP experiments: The manual series. *Proceedings of the Parapsychological Association 37th Annual Convention*, Amsterdam, Holland, 182-189.
- Lawrence, T. (1993). Gathering in the sheep and goats: A meta-analysis of forced choice sheep/goat ESP studies, 1947 - 1993. *Proceedings of the Parapsychological Association 36th Annual Convention*, Toronto, Canada, 75-86.
- May, E.C., Spottiswoode, S.J.P. & James, C.L. (1994). Shannon entropy as an intrinsic target property: Toward a reductionist model of anomalous cognition. *Proceedings of the Parapsychological Association 37th Annual Convention*, Amsterdam, Holland, 261-272.
- McCrae, R.R. & Costa, P.T., Jr. (1989). Reinterpreting the Myers-Briggs Type Indicator from the perspective of the five-factor model of personality. *Journal of Personality*, 57, 17-40.
- Moriarty, A.E., & Murphy, G. (1967a). Some thoughts about prerequisite conditions or states in creativity and paranormal experience. *Journal of the American Society for Psychical Research*, 61, 203 - 218.
- Moriarty, A.E., & Murphy, G. (1967b). An experimental study of ESP potential and its relationship to creativity in a group of normal children. *Journal of the American Society for Psychical Research*, 61, 326-338.
- Morris, R.L., Cunningham, S., McAlpine, S. & Taylor, R. (1993). Toward replication and extension of autoganzfeld results. *Proceedings of the Parapsychological Association 36th Annual Convention*, Toronto, Canada, 177-191.
- Morris, R.L., Dalton, K., Delanoy, D.L., & Watt, C.A. (1995). Comparison of the

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- sender/no sender condition in the ganzfeld. *Proceedings of the Parapsychological Association 38th Annual Convention, Durham, North Carolina, 244-259.*
- Moss, T. (1969). ESP effects in "artists" contrasted with "non-artists." *Journal of Parapsychology, 33*, 57-69.
- Moss, T. & Gengerelli. (1968). ESP effects generated by affective states. *Journal of Parapsychology, 32*, 90-100.
- Persinger, M.A. (1985). Geophysical variables and behaviour: XXX. Intense paranormal experiences occur during days of quiet, global, geomagnetic activity. *Perceptual and Motor Skills, 61*, 320-322.
- Persinger, M.A. (1989). Psi phenomena and temporal lobe activity: The geomagnetic factor. In L.A. Henkel & R.E. Berger (Eds), *Research in Parapsychology 1988*, Metuchen, NJ: Scarecrow Press, 121-156.
- Persinger, M.A. & Krippner, S. (1989). Dream ESP experiences and geomagnetic activity. *Journal of the American Society for Psychical Research, 83*, 101-6.
- Radin, D.I., McAlpine, S. & Cunningham, S. (1994). Geomagnetism and psi in the ganzfeld. *Journal of the Society for Psychical Research, 59*, 352-363.
- Rao, K.R. (1982). *J.B. Rhine, on the Frontiers of Science*. Jefferson; North Carolina: McFarland & Company, Inc..
- Rhine, J.B. (1955). Some present impasses in parapsychology. *Journal of Parapsychology, 19*, 99-110.
- Rumerick, D.K., Capasso, D.R., & Hendrick, C. (1977). Experimenter sex effects in behavioral research. *Psychological Bulletin, 84*, 852-877.
- Sargent, C.L. (1980). Exploring psi in the ganzfeld. *Parapsychological Monographs (No. 17)*. New York: Parapsychology Foundation, Inc.
- Sargent, C.L., Bartlett, H.J. & Moss, S.P. (1982). Response structure and temporal incline in ganzfeld free-response GESP testing. *Journal of Parapsychology, 46*, 85-110.
- Sargent, C.L. & Matthews, G. (1982). Ganzfeld GESP performance with variable-duration testing. *Research in Parapsychology, 1981*. Metuchen, NJ: Scarecrow Press 159-160.
- Schlit, M., & Honorton, C. (1992): Ganzfeld psi performance within an artistically gifted population. *Journal of the American Society for Psychical Research, 86*, 93-98.
- Schmeidler, G.R. (1988). *Parapsychology and Psychology: Matches and Mismatches*. Jefferson, NC: McFarland.
- Shepard, R.N. (1981). Psychophysical complementarity. In M. Kubovy & J. Pomerantz (Eds), *Perceptual Organization*. Hillsdale, NJ: Erlbaum. 279-341
- Sondow, N. (1979). Effects of association and feedback on psi in the ganzfeld: Is there more than meets the judge's eye? *Journal of the American Society for Psychical Research, 73*, 123-150.
- Spottiswoode, S.J.P. (1990). Geomagnetic activity and anomalous cognition: A preliminary report of new evidence. *Subtle Energies, 1*, 65-77.
- Standford, R.G. (1984). Recent ganzfeld-ESP research: A survey and critical analysis. In S. Krippner (Ed.), *Advances in Parapsychological Research, vol. 4*. Jefferson, NC: McFarland. 83-111.
- Watt, C. (1988). Characteristics of successful free-response targets: Theoretical considerations. *Proceedings of the Parapsychological Association 31st Annual Convention, Montreal, Quebec, 246-263*.
- White, R.A. (1977). The influence of experimenter motivation, attitudes and methods of handling subjects on psi test results. In B. Wolman (Ed.) *Handbook of Parapsychology*. New York: Van Nostrand Reinhold, 273-301.
- Willin, M. (1996). Personal communication.
- Wood, W. (1987). Meta-analytic review of sex differences in group performance. *Psychological Bulletin, 102*, 53-71.
- Zingrone, N. (1994). Personal communication.

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