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The Effect of Telepathic Assistance on Performance in a Visual Target-Search Task

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The Effect of Telepathic Assistance on Performance in a Visual Target-Search Task

BY

James A. Wachtel

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The Effect of Telepathic Assistance on Performance in a Visual Target-Search Task

Clinical Psychology Master's Thesis 2002

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Abstract

Given the significant controversy regarding parapsychology and the study of psi phenomena, there appear to be opportunities to improve design in parapsychological experimentation through the use of more sensitive and reliable means of measurement. The current study was an attempt to introduce a design that employs time as an outcome measurement, the use of groups and individuals as opposed to just individuals, and the use of more specific and focused content through the use of problem-solving tasks, in an attempt to create a sensitive and replicable experiment in telepathy. Twenty-three undergraduate participants completed 12 trials each by finding targets in complex drawings of visual noise. A group of research assistants was employed as telepathic senders. Each subject completed both telepathically facilitated trials and control trials. Comparisons of means comparing facilitated with control conditions within subjects were conducted. Correlation between belief in psi phenomena and performance on trials was tested. Evidence was not generated for the presence of an effect of telepathic facilitation on performance nor of belief on performance. Discussion includes limitations in design, more effective use of materials, and future directions for research.

Introduction

Virtually any psychologist is likely to agree that psychology currently finds itself in an age of schism and sometimes heated debate over a number of topics, theories, and models of mind and psychotherapy. Many will say that these topics are not within the bounds of psychology, that psychology must be limited to behavior alone, and that these other questions should be left to philosophers and artists. Perhaps no other topic in any line of scientific endeavor, however, has met with as much controversy over the very *existence* of the phenomena being studied as in parapsychology, the study of various phenomena regarding abilities of mind that are empirically elusive at best.

Parapsychology

As Dean Radin (1997) says in his book *The Conscious Universe*,

> Since primeval times, people have spoken of strange and sometimes profoundly meaningful personal experiences. Such experiences have been reported by the majority of the world's population and across all cultures. In modern times, they're still reported by most people, including the majority of college professors. These experiences, called "psychic" or psi, suggest the presence of deep, invisible interconnections among people, and between objects and people. The most curious aspect of psi experiences is that they seem to transcend the usual boundaries of time and space.
>
> For over a century, these very same experiences have been systematically dismissed as impossible, or ridiculed as delusionary, by a small group of influential academics and journalists who have assumed that existing scientific theories are inviolate and complete. This has created a paradox. Many people believe in psi because of their experiences, and yet the defenders of the status quo have insisted that this belief is unjustified. (p. 15).

Radin (1997) also states in the same work:

> In discussions of the reality of psi phenomena, especially from the scientific perspective, one question always hovers in the

> background: You mean this is for real? In the midst of all the nonsense and excessive silliness proclaimed in the name of psychic phenomena, the misinformed use of the term "parapsychology" by self-proclaimed "paranormal investigators," the perennial laughingstock of magicians and conjurers . . . this is for real? (p. 2).

Thalbourne (1993), concurs with the confusion and misconception present when the terms "psychic" and "paranormal" are invoked and makes it clear that application of the term "paranormal" to phenomenon such as UFOs, lost cities, etc., is unjustified. He further states that such mysterious and anomalous phenomena outside of the scope of parapsychology should not be included under this term. He argues that "paranormal" should be restricted specifically to parapsychological claims. He restricts the definitions of the terms "parapsychology," "psi phenomenon," and "psychic" to mean only those possible capacities of human *mind* that remain elusive to empirical examination.

Definitions of the the various phenomena that have been studied in the field of parapsychology (psi phenomena) are in order. As defined by Radin (1997), these are:

> **telepathy**. Information exchanged between two or more minds, without the use of ordinary senses.
> **clairvoyance**. Information received from a distance, beyond the reach of the ordinary senses. A French term meaning "clear-seeing." Also called "remote viewing."
> **psychokinesis**. Mental interaction with animate or inanimate matter. Experiments suggest that it is more accurate to think of psychokinesis as information flowing from mind to matter, rather than as the application of mental forces or powers. Also called "mind-matter interaction, "PK," and sometimes "telekinesis."
> **precognition**. Information perceived about future events, where the information could not be inferred by ordinary means. Variations include "premonition," a foreboding of an unfavorable future event, and "presentiment," a sensing of future emotion.
> **ESP**. Extrasensory perception, a term popularized by J.B. Rhine in the 1930s. It refers to information perceived by telepathy, clairvoyance, or precognition.
> **psi**. A letter of the Greek alphabet used as a neutral term for all

ESP-type and psychokinetic phenomena. (pp. 14 - 15).

As noted above, the evidence supporting the existence of psi phenomena in scientific literature has been met with great skepticism. Skeptics of paranormal claims and parapsychological research state that evidence supporting the existence of effects of psi phenomena has not been produced. Findings in parapsychological literature are typically anecdotal, non-replicated, or subject to other confounds such as misperception of ambiguous events, inaccuracy of recall, subconscious perception, and deception or even fraud (Hinds, 1995; Irwin, 1994; Wiseman & Schlitz, 1997). As Dalkvist and Westerlund (1998) illustrate, these difficulties do not interfere with the lay person's belief in the phenomena (50% believe that ESP does exist and another 25% believe that it's likely to exist) but the scientific community with its reliance on replicable, controlled experimentation for evidence has not been convinced.

One major source of difficulty with replication may stem from experimenters' attitudes and belief structure. As noted by Wiseman and Schlitz (1997), skeptics typically do not find results when conducting psi experiments, whereas proponents do. In one particular study by Wiseman and Schlitz (1997), a proponent and a skeptic teamed up in order to test for "experimenter effects," which have long been thought to be highly important in psi research. This study consisted of two different researchers running identical experiments on subconscious or telepathic detection of covert staring, which is the subjects' being stared at by individuals that cannot be seen by the subject. Controls were in place for even subtle differences in overt attitude displayed by researchers. The researchers discovered that the participants in the proponents' trials evidenced more GSR (Galvanic Skin Response, a measure of physiological arousal) to covert staring than those in the skeptic's trials. This indicates that the subjects in the proponents' trials were

somehow more sensitive to the gaze of the unseen starer than those in the skeptic's trials.

Experimenter effects may only be one way in which belief is important in psi phenomena. Research has shown that subjects who are "sheep" (people who believe in ESP) outperform "goats" (people who do not believe in ESP) in ESP experimentation (Hinds, 1995; Schlitz & LaBerge, 1997; Schmeidler, 1943 as cited in Lovitts, 1981; Thalbourne, 1993). One hypothesis for this effect is that goats, because they do not believe, avoid using ESP or intuitive suggestion, whereas sheep welcome intuitive suggestion (Schlitz & LaBerge, 1997; Schmeidler, 1960 as cited in Lovitts, 1981). The finding that sheep perform on average consistently *above* chance on ESP tasks while goats perform on average consistently *below* chance are both considered to be evidence for ESP, because without ESP, everyone should perform on average *at* chance. This finding is regarded as the most consistent finding in paranormal research, although not everyone agrees that it is evidence (Schlitz & LaBerge, 1997).

In a study by Schlitz and LaBerge (1997) investigating the effects of covert staring on humans using physiological measures, significant differences between sheep and goat subjects were demonstrated. Sixty-seven percent of subjects fell into the sheep or believer category and showed greater SCL (Skin Conductance Latency, a measure of physiological arousal) in staring trials than in control trials, while 33% of subjects fell into the goats or nonbeliever category and showed a reverse effect. This reverse effect in goats is said to evidence the "sheep vs. goats" hypothesis outlined above, because if the 33% were experiencing no effects of staring, they would have had no difference between trials, but not a *reverse* effect. Many proponents of this line of research argue that the presence of an effect, regardless of direction, is the source of evidence.

As defined by Radin (1997) above and discussed by Wiseman and Milton (1998),

clairvoyance, or remote viewing, is the form of ESP which is probably the most familiar to lay people. This is the extrasensory ability to perceive visual information without actual visual contact. Much of the experimental research in parapsychology involves remote viewing in some form. There may be difficulties particular to remote viewing that complicate replication of experiments.

An underlying assumption in much of the remote viewing literature has been that there is a signal-to-noise ratio, stated simply that extrasensory perception has to compete with all other, more relied upon, forms of sensory perception, including any internal cognition (Dalkvist, 1998). This hypothesis accounts for difficulties in most areas of psi research; it's quite possible that researchers simply haven't reliably "cut through the noise" in past experimentation. Dalkvist and Westerlund (1998) explains the Ganzfeld procedure as a sensory deprivation-based attempt to increase the signal-to-noise ratio. A soundproof room, a comfy chair, visual blocking in the form of backlit half ping-pong balls held over the eyes by straps, and white noise played over earphones are all employed in the hopes of lowering the perceptual noise level.

In an alternate strategy, emotional charge has been added to the extrasensory signal in the form of depictions of violence, carnage, etc., in an attempt to address the same signal-to-noise ratio difficulty (Dalkvist & Westerlund, 1998; Parker, Grams and Pettersson, 1998). As Parker, Grams and Pettersson (1998) state, "Targets showing rapid changes in 'entropy' have been associated with success (May, Spottiswoode, & James, 1994), and one way of interpreting this is in terms of the function that psi may have in alerting the organism to sudden changes occurring in the environment -- a survival value." (p. 321). Essentially, when subjects demonstrate rapid changes in physiological arousal on a trial, they subjectively report feelings of success in remote viewing in that trial,

which can be interpreted as a demonstration of the survival value of remote viewing ability. The authors further state that "the analysis of psi-target emotionality in relationship to sudden change of emotion supported the hypothesis that this is a factor in constituting a good target." (p.329). In other words, visual stimuli associated with emotional content demonstrate greater ability to elicit experimental evidence of remote viewing.

A study by Braum et al. (1995) proposed that another possible way to reduce the signal-to-noise ratio would be to increase the signal by having the subject and sender focus on identical stimuli. In this study, researchers examined the effectiveness of using a telepathic sender, someone who claims to have ability in ESP, in helping people concentrate on a votive candle. "Telepathic sending" involves an individual's attempt to make information in their mind available to others without the use of any form of known communication. Researchers hypothesized that the participant should be less distracted and be more able to concentrate on the candle when a sender is also concentrating on an identical candle. Their hypothesis was supported by the results that Help and Control periods differed significantly in the number of distractions reported. A difficulty in this study is that subjects were responsible for reporting their own distraction, which opens doors for a number of measurement errors.

This review of parapsychological research is by no means comprehensive, but its purpose is to outline the prevalent and common difficulties faced in psi research in replication of results and control of confounds. Self-reporting, belief effects, emotionality of targets, and the signal-to-noise ratio may all be major contributors to the elusiveness of psi phenomena in empirical investigation.

Field Theory

A discussion of "field theory" and systems theory are relevant to the current study. Many forms of family therapy are based in large part on general systems theory, which is outlined below. Field theory (Lazlo, 1996; Radin, 1997; Schwartz & Russek, 1999; and Sheldrake 1987a, 1987b, 1988) serves to extrapolate from general systems theory into theorized nonphysical means of relatedness and interaction. Field theory, while applicable to many issues, may be of particular importance in psychology to better understand family and group interactions, including social organization, interpersonal relationships of varying complexity, and even intrapersonal function.

As described by Brown and Christensen (1999), general systems theory is derived from biology and medicine and has been applied in family therapy to families and couples. They detail several key concepts from systems theory that are important to an enriched understanding of field theory. These concepts are not completely distinct, but are explanatory terms regarding different aspects of relation between members of systems:

• Interrelatedness – All systems are comprised of subordinate systems, which in turn comprise superordinate systems. Atoms, molecules, cells, tissues, organs, organ systems, the individual, the family, the subculture, the culture, etc.

• Wholeness – This concept conveys the Gestalt view that "the whole is greater than the sum of its parts." According to this concept, a reductionist view can tell us about the nature of the individual component at hand. To understand the system in which the component functions, however, one must regard the system itself as it relates to its environment without specific regard to any one of its component's activities at a given moment. Any exploration is by nature reductionistic if one considers interrelatedness to

be accurate, as this concept provides for an infinitude of levels of relational systems. Our reductionistic understandings therefore, according to wholeness, are confined to the context or systemic level from which they are derived.

• Feedback – Systems feedback is the process by which information governing the behavior of one member of a system may indirectly originate from that very member. Circular feedback loops are the result of systems feedback (A--> B --> C --> A), such as heating and cooling systems in which a thermostat indirectly regulates its own activity. When the thermometer (A) in the thermostat reaches a certain temperature, it flips an electrical switch (B), which sends power to the air conditioner (C), which changes the temperature in the room (A). If one extrapolates this concept, each part of a system in which a circular feedback loop is present can be said to be the origination of causality depending on point of view and research question. This concept calls into question the validity of the use of linear causality in thinking about systemic interaction.

• Homeostasis – This concept refers to the tendency of systems to seek stability and equilibrium. Feedback either reflects and encourages change (via positive feedback), thereby temporarily undermining homeostasis, or reinstates stability (via negative feedback), i.e., homeostasis.

• Equifinality – This concept posits that there are many paths to the same end state, more accurately the current state, as there can be no end state. As systems are constantly evolving; understanding the current state serves more purpose than understanding the means by which the system achieved that state.

With these concepts in mind, evolution can be described as a positive feedback loop which enables a system to maintain its homeostasis more effectively under more conditions as the system progresses through time and broadens its experiential repertoire.

From this viewpoint, all systems from the macro- to the microcosmic, are as they are because of learning or natural selection. Sheldrake (1988) argues that laws of nature are not laws in a binding or eternal sense, but are instead statistical probabilities of nature. He suggests that systems behave as they do not by obeying universal laws as the current conventional understanding provides, but based on the habits established by preceding like systems. In other words; systems evolve over time without confinement by death or physicality. Sheldrake (1987a) states,

> If the laws of nature existed before the Big Bang, then it's clear that they are nonphysical; in fact they are *metaphysical*. This forces out into the open the metaphysical assumption that underlay the idea of eternal laws all along.
>
> There is an alternative, however. The alternative is that the universe is more like an organism than a machine. . . . With this organic alternative, it might make sense to think of the laws of nature as more like *habits*; perhaps the laws of nature are *habits* of the universe, and perhaps the universe has an *inbuilt memory*. (pg. 12).

Sheldrake names this influence of past forms on present forms the "*hypothesis of formative causation.*"

Sheldrake (1988) further explains that this hypothesized form of causality proceeds by morphic fields, which carry information in a manner analogous to memory as possessed by an entire species. "The organizing fields of animal and human behavior, of social and cultural systems, and of mental activity can all be regarded as morphic fields which contain an inherent memory" (pg. 113). In other words, we can think of the behavior and form of a system as being carried in morphic fields in the same way that we think of an individual human's habits and memories being carried in their mind. Sheldrake (1987a) suggests that memory may not reside in physical space as we know it, but may

be contained in a field surrounding and penetrating the system. He further makes an analogy to electromagnetic, weak and strong nuclear, and gravitational fields, which despite their invisibility and our lack of understanding of their nature, are not controversial in their existence or their ability to influence physical matter, despite their seemingly complete lack of physical substance.

As Mishkind (1993) points out, this model is highly similar to Jung's collective unconscious in that there is a common level of mind to all members of a species or field. Other authors (Lazlo, 1996; Radin, 1997; Schwartz & Russek, 1999) outline highly similar theories of both an organismic nature of the universe and the resulting implication that life is simultaneously determined by and determines a nonphysical system of fields. Sheldrake (1987b) writes directly on the subject of how this field theory applies to social systems:

> I want to explore some ideas about the social and cultural aspects of morphic fields and morphic resonance. A familiar comparison might be that of a hive of bees or a nest of termites: each is like a giant organism, and the insects within it are like cells in a superorganism. Although comprised of hundreds and hundreds of individual insect cells, the hive or nest functions and responds as a unified whole.
>
> My hypothesis is that societies have social and cultural morphic fields which embrace and organize all that resides within them. Although comprised of thousands and thousands of individual human beings, the society can function and respond as a unified whole via the characteristics of its morphic field. . . (p. 320).

General systems theory does not address the possibility that the system of interrelatedness that comprises a family (or any system at any level) may utilize unknown forms of communication. However, the concepts of morphic resonance and morphic fields may provide for the theoretical integration of psi phenomena and systems

interaction, as psi phenomena are taken as examples of field influence on systems. This theoretical stance supplements known and well-observed capabilities and tendencies with theoretically proposed abilities and means of interaction that might explain anomalous phenomena. With this theory and its potential relationship to family systems, social structure, and interpersonal relationships in mind, it seems possible that many unexplainable phenomena may be examples of field influence in everyday life, and may occur more often than currently realized and in more people than currently believed.

The Current Study

The current study employed a goal-oriented task in the attempt to more reliably lower the signal-noise ratio described in previous studies. The type of task employed by this experiment was to determine the location of a target object in a complex visual stimulus.

As noted above, Parker, Grams, and Pettersson (1998) state that the relationship between the emotional charge of experimental targets and the generation of empirical evidence for ESP suggests there may be a survival value component to ESP. In that ESP seems to be "goal-oriented" (Foster, 1940), use of an operant task may address the possibility that organisms gain a survival advantage through ESP in much the same way that emotionality might address this possibility. The use of a task should remove the disadvantage of weak interrater reliability in "emotionality." Tasks and goals are more objective than emotional experiences; they consist of objective criteria that determine that they have been completed. Tasks are also simpler to discuss, both between researchers in the literature and in addressing subjects during experimentation about the nature of their participation.

The central independent variable manipulation was the presence vs. the absence of

remote group influence (herein called the sender group) during a given trial (Facilitated vs. Control Trials). Each subject was expose to both Control and Facilitated conditions. The use of a group of senders may incorporate Braum et al.'s (1995) findings that focus and concentration may be increased through the presence of other people focusing on the same stimuli, and is consistent with the above field theory discussion. On Facilitated trials, the sender group was aware of and concentrated on the location of the target object that the participant was looking for. The participant tried to find the object as quickly as possible with the sender group watching and knowing the answer. On Control trials, the sender group had no knowledge of the current task, and the view of the participant by the sender group was eliminated, thus isolating the participant from the sender group's awareness. This within-subjects manipulation provided for clear distinction between the two trial groups. Individual differences between subjects in both latent performance speed and time between finishing the task and pressing the signal were controlled by the within-subjects design.

The current study was also designed to take into account the effects of *individuals' beliefs* on their manifestation of psi phenomena during goal-oriented performance, as this variable seems highly important to the manifestation of psi phenomena (Hinds, 1995; Schlitz & LaBerge, 1997; Thalbourne, 1993). Belief was assessed through a standardized survey by Thalbourne (1993) called the Australian Sheep/Goat Scale (herein ASGS) in order to measure for effects of belief or nonbelief (sheep vs. goat effects).

Performance on the trials was used as the point of comparison between the facilitated and control conditions. Performance was measured by the amount of time taken to solve each trial.

The current hypotheses were that the sender group (or "social field") would facilitate the individuals' performance during *Facilitated trials* (experimental condition) as compared with *Control trials* and that the individual subjects' beliefs would mediate the strength and direction of these effects. Sheep should have performed better on Facilitated trials than on control trials because Sheep believe in and are welcoming of intuitive suggestion (as defined above), and so are willing to use information that might be transmitted through such channels. Goats should have performed better on Control trials than on Facilitated trials because goats are typically theorized to consider the content of intuitive suggestion only after all other options have been systematically eliminated. This tendency may be especially powerful when they are aware that they are involved in an attempt to evidence psi phenomena (Schlitz & LaBerge, 1997). Means for Control trials should not have differed significantly between sheep and goats.

Method

Participants

I conducted a series of preliminary trials in order to determine normative data for each of eighteen possible stimuli. Ten undergraduate students volunteered through the Eastern Illinois University undergraduate introductory psychology subject pool for these preliminary trials. This number of subjects was largely the result of time and resource constraint. (See Appendix A for Demographic Survey and Data for both preliminary and experiment samples.)

Twenty-five people volunteered through the Eastern Illinois University undergraduate introductory psychology subject pool for this experiment. Two committed errors during administration that caused their data to be unusable (N=23). The error in both cases was the skipping of a stimulus during the experiment through the subject's turning more than one page. This resulted in the subject and the sender group being unsychronized from the point of the omission onward. Subjects were selected by volunteerism from the subject pool at EIU.

The sender group (described below) consisted of ten student participants assembled from undergraduate research assistants and independent study students. This size was selected following the common knowledge understanding among group psychotherapists that this seems to be the optimal size for a group when solid and consistent cohesion are important.

Preliminary Preparation of Stimuli

We used Martin Handford's "Where's Waldo" series of children's books for stimuli in this study (1987, 1988, 1993). These books consist of large complex drawings of chaotic scenes of people and objects in different settings. Each drawing contains a

number of targets (Waldo is always one of these targets) which the "reader" can find in each drawing. Due to the nature of the task involved in "Where's Waldo," and in consideration of the availability of these books, this seemed the most efficient stimuli for this experiment. Due to their size, the "Where's Waldo" drawings were cropped in order to make the task less time-consuming. I realized that the subjects may have had prior knowledge of Waldo's location due to prior contact with these books, so targets other than Waldo himself were selected. The quarter of a drawing in which the target is located was cropped from the rest of the drawing. These croppings were made uniformly in relation to the outside edges of the complete drawing and not in relation to the target's location. In other words, drawings were divided into quarters before the targets' locations were selected. Adobe Photoshop 5.0 was employed in copying the targets and pasting them into a top margin on the stimuli for presentation to the subject. Each drawing was also labeled with a number (1-18) in order to match measurements to stimuli. The drawings were then laminated to protect them and to allow subjects to temporarily mark them without effacing the stimuli. (See Appendix B for samples of stimuli).

I administered the stimuli to the ten participants prior to the experiment in order to establish normative data. Participants were seen individually so that I could accurately record times for each drawing and in order to replicate experimental conditions in which subjects will need to be run individually. When the subjects arrived for their participation appointment, informed consent was obtained. Informed consent included detailed instructions on completing the task, and verbal instruction was offered as necessary (see Appendix C) . I used a stopwatch to collect completion times for each stimuli and a dry erase marker was used by participants to indicate their solution.

I calculated each item's mean time for completion across participants, and the

items were matched in pairs based on having similar mean times for completion. Before matching, three stimuli (stimuli numbers 1, 14, and 17) were removed from consideration based on very high mean times for completion (77.57, 50.05, and 100.96 sec, respectively). This left an odd number of possible stimuli. We removed item 5 from consideration for use in the experiment because its mean did not match closely with any other obtained mean. Seven pairs of stimuli with similar means were constructed. We used the pair which included items 10 and 7 as practice items in experimentation due to their means being the most different of any of the final pairs, leaving twelve pairs from which data would be recorded in the experiment (See Appendix D for preliminary data).

I assigned the items in each pair to Facilitated or Control conditions for the experimental phase of this study. The item in each pair with the lower completion time was placed in the Control condition and the other item was placed in the Facilitated condition (see Appendix E for stimuli pairs) . This was done in order to ensure that the Facilitated condition would not be faster or consist of the easier stimuli. The sender group did not know the answers to the Control stimuli at any time.

Materials

Three rooms on separate floors of a building and a closed-circuit TV system (camera, cable, monitor) were utilized. These rooms were isolated from one another by both sound and sight, eliminating the possibility of conventional means of communication.

We used two walkie-talkies with a "page" function, which allowed a consistent sound to be played on one walkie-talkie when the button on the other is pressed. Walkie-talkies with this paging function were the most convenient apparatus for signaling non-verbally between subject and sender group.

We used two stopwatches for time keeping.

We used the Australian Sheep-Goat Scale (forced-choice format) to test for belief in ESP (see Appendix F for ASGS). Results of a validation study indicated that internal reliability (Cronbac's $\underline{a} = .94$), test-retest reliability ($\underline{r} = + 0.66$ after one year), and concurrent validity ($\underline{r} = + 0.72$, compared to the Paranormality Scale) were all high (Thalbourne, 1993). Factor Analysis indicated three factors accounting for 59.7% of variance. The first factor accounted for 49% of the variance and consisted of all but one of those items regarding belief in and experience of ESP. The second factor, 7% of the variance, consisted of items regarding psychokinesis, and the third factor, 3.7% of the variance, consisted of items related to life after death and contact with spirits. It is notable that this scale tests for beliefs that personal experiences include ESP as well as a more abstract belief that ESP is possible (Thalbourne, 1995a).

We used the "Where's Waldo" series of children's books for stimuli in this study as prepared above. We determined that counterbalancing, controlling the presentation order in different conditions to control for order effects, would be beneficial based on the possibility of practice and fatigue effects. I duplicated the stimuli and assembled them into two packets based on counterbalancing condition. These were bound in separate loose-leaf notebooks. I renumbered them as Control (C)1 - C6 and Facilitated (F)1 - F6. Facilitated and control trials alternated within the packets in blocks of 3 trials (F1, F2, F3, C1, C2, C3, F4, etc.) Counterbalancing condition 1 had the Facilitated set first, and condition 2 had the Control set first. Other than the difference between counterbalancing condition, presentation order was the same in both packets.

I prepared transparency copies of the Facilitated set of stimuli and the solutions to these stimuli were indicated in permanent marker on these transparencies. These served

as the answer key for the sender group. An overhead projector was used to make the answers visible for the sender group to see.

Procedure

A closed circuit TV system is in place at EIU in the Psych experiment labs (herein "lab") on the third floor of the Physical Sciences building, room 329. There is a large projection monitor in the lecture hall (herein "classroom") on the second floor of the building, room 222. We (author, advisor, and sender group) ran a coaxial cable from the lab upstairs to the classroom monitor downstairs to integrate this display into the existing closed-circuit system. We set up a table in the lab where both the subject and the tasks were visible on camera. A third room, 331a was used as a briefing and debriefing room (herein "lounge").

The sender group took their place in the classroom. Interaction of the sender group with the subject was manipulated by power running to the projection monitor; the monitor was switched on during Facilitated trials and off during Control trials by a sender group member. This control ensured that the sender group was prevented from learning solutions to Control stimuli and therefor helping on those trials.

Participants were met by the experimenter and at a table in the lounge. I briefed the participant on the nature of the experiment. After providing informed consent (see Appendix G), the participant completed a demographic survey and the Australian Sheep-Goat Scale. I then escorted the participant to the classroom and introduced them to the group of senders in order to attempt to lessen the participant's anxiety about being watched. I then oriented the participant to the lab and the actual task. I gave instructions verbally with practice items at this point (see Appendix H for entire instruction script). Participation involved waiting for a chime through the walkie talkie, presenting oneself

with the next stimuli from the booklet, completing that trial, and then sending a chime back to the sender group once completed. When the participant indicated understanding of the experiment, I asked them to begin as instructed and left them alone.

In the classroom, the sender group noted the counterbalancing condition (A or B) and readied the equipment accordingly. During the participant's practice items, they watched the experimenter and participant over the monitor and, at the appropriate time, they sent a chime over the walkie talkie that informed the participant that it was time to begin a trial. The participant immediately turned to practice stimulus 1, found and circled the target, and indicated completion by sending a chime back to the sender group over the walkie-talkie. Two trials were practiced in this manner. After the experimenter left the subject, the sender group prepared for the correct counterbalancing condition, and then signaled the participant that the experiment was beginning. Each trial began and ended with a chime for timing purposes and synchronization of the group and the participant.

Two timers were present in the sender group room and sat on opposite sides of the room. Two timers were used in order to control for the possibility of measurement errors. By using two individuals as timers and then averaging their times later for use in statistical analysis, times were more likely to be accurate measurements than if we assumed that one timer was appropriately consistent. Time of each trial began and ended as determined by the sounding of the chimes. Timers oriented to the ending of the chime sound, as the sound was of uniform length each time it sounded and anticipation aided timers in synchronizing with one another. Timers recorded times on data sheets.

When all trials were complete, the participant was debriefed. Any individual subject was there for a maximum of twenty minutes.

Results

To test for a relationship between subjects' belief in ESP as measured by scores on the Australian Sheep-Goat Scale and subjects' performance on Waldo tasks, I ran a Pearson's *r* correlation on the data. Prior to this test, I subtracted facilitated scores from their matched control scores to yield a new variable; a difference between trial conditions (control score - facilitated score = difference between condition, herein "DBC"). A positive value for this number would indicate more time taken on control trials than on matched facilitated trials. A negative value for this number would indicate more time taken on facilitated scores than on control trials. On the ASGS, higher scores indicate more belief in psi phenomenon. So, if the hypothesis that belief affects performance on trials is accurate, I expected a positive correlation between ASGS score and difference between groups. Results of Pearson's *r* test indicated that no correlation of belief with performance was demonstrated in this experiment.

To test for the presence of an effect of facilitation by the sender group (or social field), we ran t-tests for paired samples on each stimuli pair. If the hypothesis that a group of people knowing and telepathically sending information can effect an individual's performance on a task is accurate, we expected to see a significant difference between performance in facilitated and control groups. T-tests were non-significant for all pairs except Pair 3, $t = 2.53$, $p = .02$, two-tailed. Pair 3 was a comparison between Stim15 (C2 of the Control group) with a mean time of 18.27 sec and Stim11 (F3 of the Facilitated group) with a mean of 23.50 sec. The null hypothesis was accepted in all cases except one; no effect was demonstrated by sender group facilitation. An effect in the opposite direction from theoretical expectation was demonstrated in one case.

On observation of the data, we hypothesized that large outlier scores in the data

may have been influencing the accuracy of means and therefore the t-tests in this study. We determined that a non-parametric assessment of the data might prove beneficial in understanding the results of this experiment. From the DBC variable generated above, we created a new variable by transforming the direction of this score into a dichotomous variable. All positive values for this variable became "1" and all negative values became "-1." This allowed for a chi-square to determine the number of times differences were in each direction. In other words, we wanted to consider the *direction* of the differences between facilitated and control groups without regard to the *magnitude* of those differences. If the hypothesis that the sender group exerted influence on the individuals' performances is accurate, a chi-square test should show a unexpectedly large number of differences in one direction or the other as predicted by chance. The chi-square test yielded divergence from expected results in only the second and third pairs, $p < .05$, but not overall. The null hypothesis that there was no effect demonstrated was accepted in this case as well.

Discussion

Overall, evidence was not generated for hypotheses that facilitation by a group of telepathic senders would improve performance nor that belief in ESP would mediate the effect of facilitation on performance. In the case of one stimulus pair only, a significant difference between Facilitated and Control stimuli was discovered. This case is the exception in this study, and will be discussed below. Even when we considered the *direction* of differences between Facilitated and Control groups without regard to the *magnitude* of differences, no overall effect could be shown. The clearest conclusion that we can draw from these results is that this study did not produce evidence for extrasensory phenomena.

The current study therefore, cannot directly contribute to our understanding of psi phenomena at this time. It may, however, provide important clues into our understanding of effective ways of studying these phenomena. If these phenomena do indeed exist, an understanding of them would revolutionize our models of virtually every aspect of human and social functioning. The establishment of methods of experimentation that can reliably demonstrate not only the existence of psi phenomena, but the "rules" that govern them would redefine much of modern psychology. The current study may provide important clues into the establishment of that methodology.

In consideration of past research on the question of the existence of telepathy, we noted major incongruencies between previous and current results. We did not replicate results of previous research studies that demonstrate sheep vs. goats effects nor even the presence of any paranormal effect. Noting standard errors of means and standard deviations in preliminary data (see Appendix D), the stimuli used in this study do not appear to have reliable normative data. This lack of normative data may help to account

for these discrepancies between the literature and the current results. If we do not have reliable normative data with which to compare Facilitated data, we cannot have sensitive or accurate statistical measurement in this design. Upon establishment of stable normative data for these stimuli, this design might be employed with more meaningful results.

There are possible limitations inherent in the stimuli themselves without regard to normative data. The task itself may not be emotionally engaging enough nor similar enough to a natural use of the phenomena to allow sensitive measurement. The content of the psi phenomena in this experiment was designed to be of a different kind from that in past literature. We may have hypothesized incorrectly about the appropriateness of the use of a visual target-search problem. If this design fails even after the establishment of reliable stimuli, the exploration of other tasks such as less complex visual search tasks, anagrams, or block design tasks may provide for a more effective method of creating the experimental sensitivity necessary to "cut through the noise" of the signal-to-noise-ratio phenomenon.

Another possibility for the lack of evidence generated by this study may be that I failed to establish favorable conditions for facilitation to occur. I was particularly interested in the paired samples t-test which compared Stimulus 15 (C2) to Stimulus 11 (F3), in which significant differences between facilitated and control groups *were* demonstrated. It is interesting to note that the direction of the one significant test of differences in this study was the opposite of that predicted by the hypothesis being tested, that telepathic facilitation would speed performance. In the case of this Stimulus Pair, subjects were significantly faster on the control stimulus than on the facilitated stimulus, indicating the possible explanation that "telepathic facilitation" actually *inhibited* performance. Note that score on the belief measure was not controlled for in this

statistical measurement, and so this tendency was present across the range of ASGS (belief) scores.

I hypothesize that this may be the result of an in-group vs. out-group effect. The possibility exists that the extent to which the group identifies an individual as a member of its ranks mediates the beneficence of the group's interaction with that individual. I generated this hypothesis from consideration of this data in combination with our informal observations that the group sometimes regarded participants as "outsiders" or even as undesirable, whereas other participants were more acceptable to the group. It seems plausible that the group's inconsistency in identifying with the subjects in this experiment inhibited consistent extrasensory contact in this study. It seems equally plausible that the individual participant's feelings of acceptance or rejection *of the group* would create the same barrier for communication. It may simply be a feature of a social field to establish boundaries for itself. In much the same way that an individual human infant goes through a process of learning what is "me" and what is "everything else," a social field may limit its influence to in-members. Perhaps the establishment of an in-group mentality is essential to the favorable conditions mentioned above for true facilitation to occur.

It may also be that the sender group members' beliefs were not as uniformly positive as assumed in this study. In future study, measurement of sender groups as well as participants through the ASGS should be included to avoid the possibility of erroneous assumption in this matter.

We recommend that further study first involve administering stimuli to a large number of participants under normal conditions so that means and standard deviations can be established as accurate and reliable. The establishment of reliable normative data

for stimuli seems the necessary first step in utilizing this design. Given the failure of this design to produce results after such normalization is complete, exploration of other possible stimuli might provide for a stimuli that is more appropriate or effective in creating the seemingly necessary emotional investment in manifesting psi phenomena.

If the ingroup vs. outgroup hypothesis is accurate, consideration of it in future experimentation should increase the sensitivity of the current design and the likelihood of discovering evidence. Evidence for the in-group vs. out-group hypothesis could be generated through the operationalization of and manipulation of "in-groups" and "out-groups" in further study utilizing this basic design. Simple administration of a survey to the sender group on likeability or attributed competence of a subject might provide for a measure of the level of integration of the group and the subject. Advantages of this approach include its potential to create a normal distribution of degrees of acceptance and rejection, which would enhance sensitivity. It might also make sense to create two separate cohesive groups of people and then test them on their ability to facilitate performance within groups. A few members from each group could then switch groups, and out-group facilitation would then be possible within the newly formed, but no longer cohesive groups. While this second approach does not allow for the creation of normal distribution of likeability as the first approach does, it may actually be more advantageous to create a polarization of "in-group" and "out-group" in the study of this hypothesis.

These possible methods of increasing experimental sensitivity through the modification of the current design may allow researchers to conclusively evidence phenomena that half of laity insist are real, but that currently lacks scientifically based empirical support.

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Appendix A: Demographic Survey and Data

Demographic Survey

Please take a moment to circle the designations that best fit you. Demographic information is being collected because it may provide important clues into how the results of this study are influenced by Cultural factors.

Ethnicity

White/Non-Hispanic
Hispanic
African-American
Asian
Pacific Islander
Native American
Other:_____

Gender: Male / Female

Religious Preference:

Atheist
Buddhist
Catholic
non-Catholic Christian
Judaism
Hindu
Muslim
Other:_____

Table A1

Frequencies of Demographic Data in Preliminary Phase

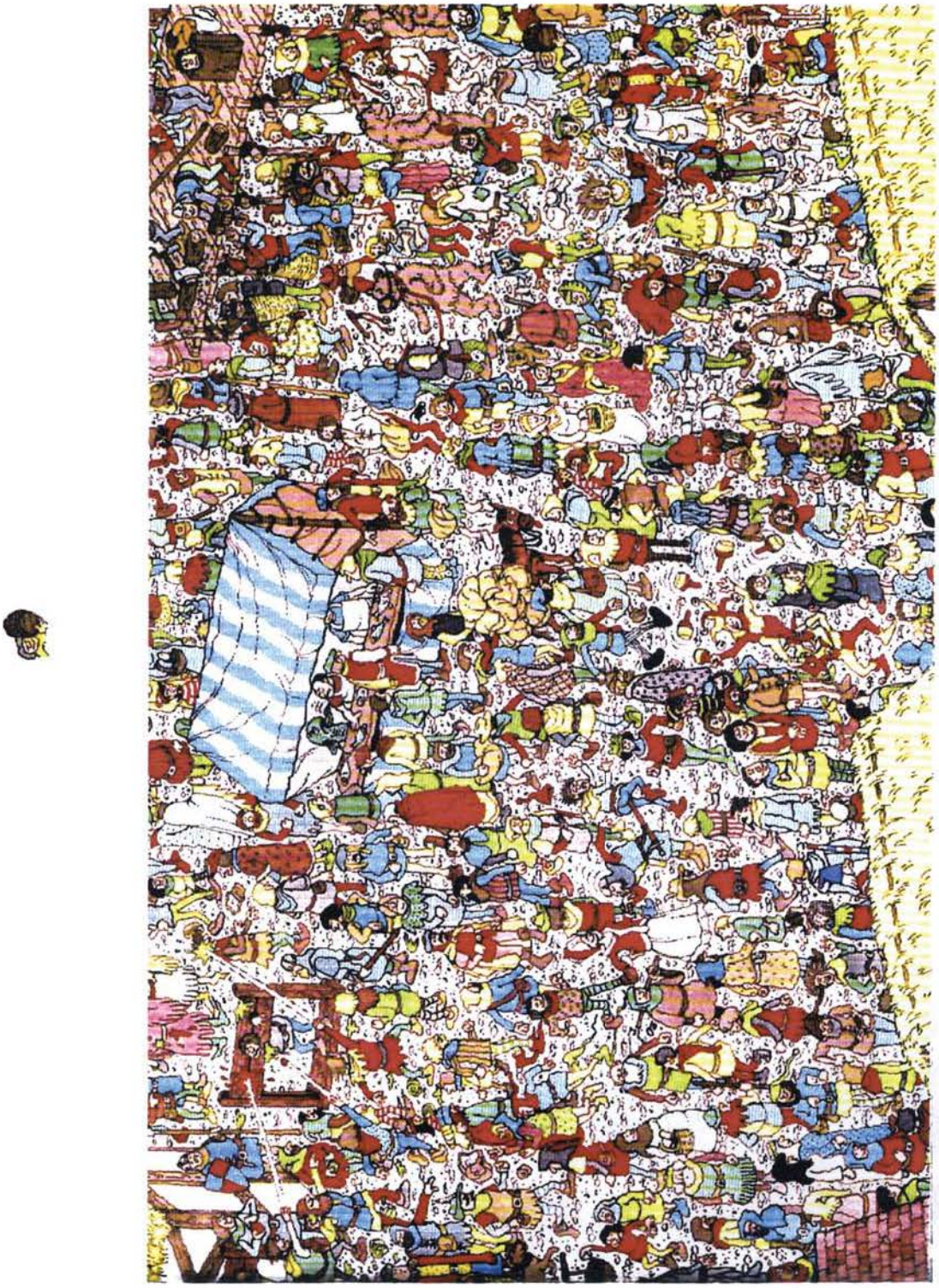
Response	Frequency	Percent of Total
Ethnicity		
White/Non-hispanic	9	90
African-American	1	10
Gender		
Male	6	60
Female	4	40
Religious Preference		
Atheist	1	10
Catholic	3	30
Non-Catholic Christian	5	50
Other	1	10

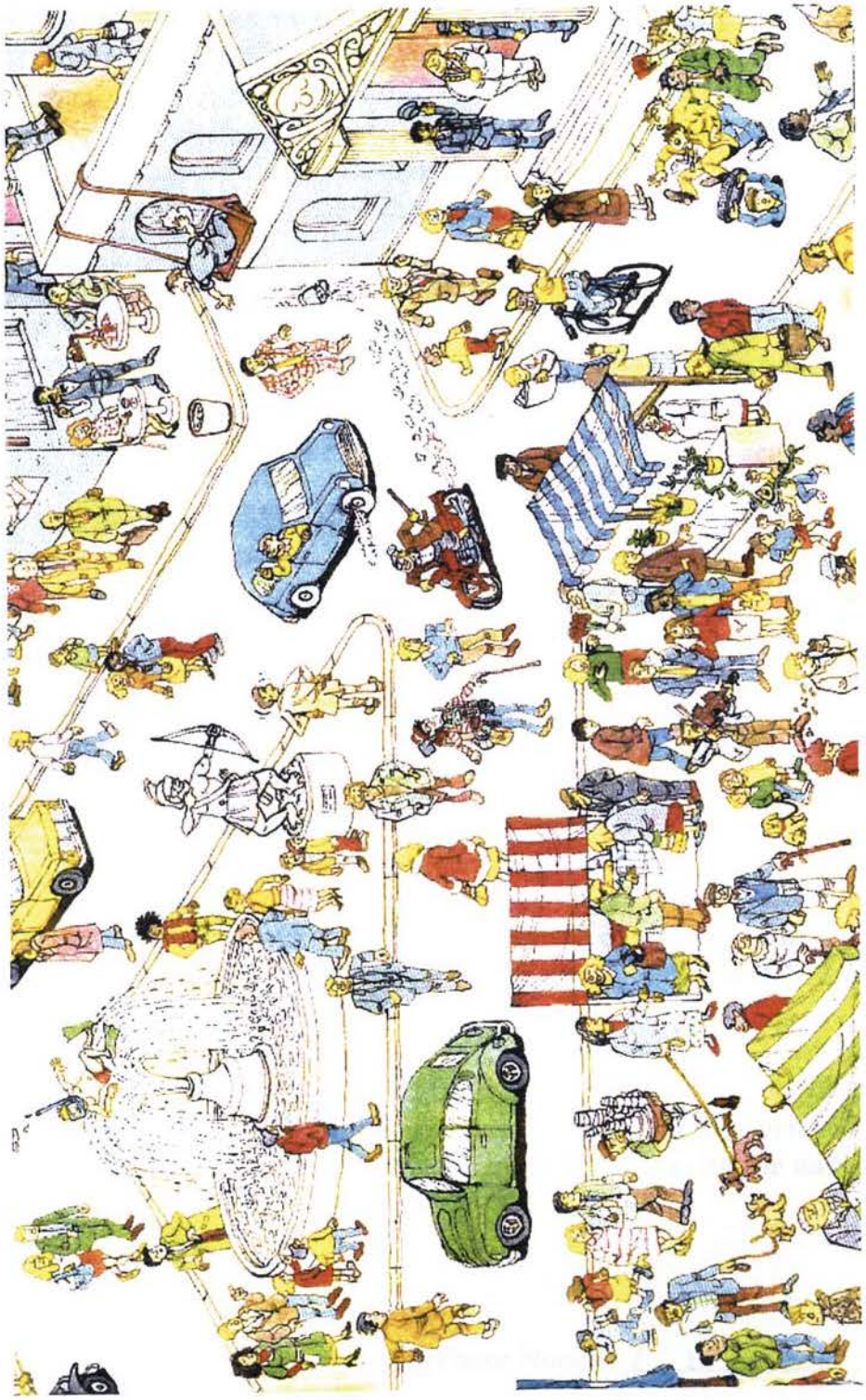
Table A2

Frequencies of Demographic Data in Experiment Phase

Response	Frequency	Percent of Total
Ethnicity		
White/Non-hispanic	21	84
Hispanic	3	12
African-American	1	4
Gender		
Male	11	44
Female	14	56
Religious Preference		
Atheist	2	8
Catholic	18	72
Non-Catholic Christian	3	12
Other	2	8

Appendix B: Stimuli Samples





Appendix C: Informed Consent for Preliminary Data Collection

Informed Consent for pilot phase of "Telepathic Where's Waldo?"

This study involves the experimental examination of telepathy, which is the communication between one mind (or group of minds) and another mind (or group of minds) without an understood method for communicating. "Mental telepathy," as it is often called, involves the "sending" of information directly from one mind to another without verbal or written or any other physical form of communication.

I will be doing my task in a controlled, but normal environment. I am aware that this phase of the study is designed to get ready for the experiment and that no experiment will actually be going on during my trials. I will do the best that I can to complete each trial quickly and accurately.

Before I begin completing trials, I will be asked to fill out a Demographic Questionnaire. I am aware that confidentiality is protected because my name is not on the Demographic form or my actual trial data. My name will only be on this Informed Consent Sheet.

For each trial, I will be asked to find a particular figure in a drawing from a series of children's books called "Where's Waldo?" I will be asked to find the target figure in each of these drawings and circle it with a marker.

I will be asked to do this for fifteen trials. I will be presented with a total of fifteen drawings and there will be one target figure for each drawing. During the trials, I will be presented a drawing at the same time that timing will begin. When I have circled the target figure correctly, the timing will stop. After my time is recorded, I will be presented with the second drawing, etc., until fifteen trials have been completed.

I am aware that my participation in this study is completely voluntary, that the information obtained in this study will not be attached to my name in any way, and that I may withdraw my participation at any time without penalty. Before I signed this sheet, I asked any questions that I needed to ask to clarify the nature of my participation.

Signature_____Date_____Phone Number_( )_____

Appendix D: Preliminary Data for Stimulus Baselines

Descriptives of Stimuli Scores in Pilot Trials

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std.
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
STIM1	9	7.50	146.27	77.5767	13.2694	39.80819
STIM2	10	7.62	107.81	25.1820	9.4459	29.87041
STIM3	9	4.75	42.09	23.9367	4.5539	13.66161
STIM4	9	8.68	52.43	22.7911	4.9357	14.80713
STIM5	9	6.18	113.68	35.0122	11.4364	34.30922
STIM6	10	4.64	44.93	24.6960	3.4285	10.84195
STIM7	10	3.87	34.40	15.1220	3.2193	10.18046
STIM8	10	5.56	23.03	13.2240	1.7592	5.56293
STIM9	10	10.37	54.31	19.8740	4.1707	13.18892
STIM10	10	2.96	18.50	11.9050	1.4034	4.43779
STIM11	10	7.96	58.12	26.1940	4.9556	15.67110
STIM12	10	3.96	25.21	13.5590	2.2132	6.99873
STIM13	10	10.65	62.40	23.9030	5.0927	16.10468
STIM14	8	7.93	111.81	50.0475	13.8087	39.05679
STIM15	10	5.96	82.15	26.0970	7.0279	22.22415
STIM16	10	8.31	39.75	17.2550	2.9832	9.43364
STIM17	5	45.65	186.00	100.9640	24.1372	53.97247
STIM18	10	2.48	39.46	16.3220	3.8136	12.05975
Valid N (listwise)	2					

Appendix E: Stimuli Pairs

Paired stimuli based on mean (see SPSS output).

Pair 1 = Stim8 (13.22) - Stim12 (13.55)

Pair 2 = Stim13 (23.90) - Stim3 (23.94)

Pair 3 = Stim15 (26.10) - Stim11 (26.19)

Pair 4 = Stim6 (24.70) - Stim2 (25.18)

Pair 5 = Stim18 (16.32) - Stim16 (17.26)

Pair 6 = Stim9 (19.87) - Stim4 (22.79)

Practice Set = Stim10 (11.91) and Stim7 (15.12)

Appendix F: The Australian Sheep/Goat Scale

The 18-item Australian Sheep-Goat Scale (Forced-Choice Format)

1. I believe in the existence of ESP.
2. I believe I have had personal experience of ESP.
3. I believe I am psychic.
4. I believe it is possible to gain information about the future before it happens, in ways that do not depend on rational prediction or normal sensory channels.
5. I have had at least one hunch that turned out to be correct and which (I believe) was not just a coincidence.
6. I have had at least one premonition about the future that came true and which (I believe) was not just a coincidence.
7. I have had at least one dream that came true and which (I believe) was not just a coincidence.
8. I have had at least one vision that was not an hallucination and from which I received information that I could not have otherwise gained at that time and place.
9. I believe in life after death.
10. I believe that some people can contact spirits of the dead.
11. I believe that it is possible to gain information about the thoughts, feelings, or circumstances of another person, in a way that does not depend on rational prediction or normal sensory channels.
12. I believe that it is possible to send a "mental message" to another person, or in some way influence them at a distance, by means other than the normal channels of communication.
13. I believe I have had at least one experience of telepathy between myself and another person.
14. I believe in the existence of psychokinesis (or "PK"), that is, the direct influence of mind on a physical system, without the mediation of any known physical energy.
15. I believe I have personally exerted PK on at least one occasion.
16. I believe I have marked psychokinetic ability.
17. I believe that, on at least one occasion, an inexplicable (but non-recurrent) physical event of an apparently psychokinetic origin has occurred in my presence.
18. I believe that persistent inexplicable physical disturbances, of an apparently psychokinetic origin, have occurred in my presence at some time in the past (as, for example, a poltergeist).

All items have three alternative responses: (a) true, (b) uncertain, and (c) false. The scale score is obtained by assigning two points for a "true" response, one point for "uncertain," and zero points for "false," and then summing the points for the 18 items. *Range of Possible scores*: 0 - 36. (Thalbourne, 1995a).

Appendix G: Informed Consent for Experimental Trials

Informed Consent for experimental phase of "Telepathic Where's Waldo?"

This study involves the experimental examination of telepathy, which is the communication between one mind (or group of minds) and another mind (or group of minds) without an understood method for communicating. "Mental telepathy," as it is often called, involves the "sending" of information directly from one mind to another without verbal or written or any other physical form of communication.

Before I begin completing trials, I will be asked to fill out a Demographic Questionnaire and the Australian Sheep-Goat Scale (which measures my level of belief in paranormal events). I am aware that confidentiality is protected because my name does not appear on these forms or my actual trial data. This Informed Consent Sheet is the only sheet that my name will be on, and my name will not be attempted to be linked to my subject number in any way.

For each trial, I will be asked to find a particular figure in a drawing from a series of children's books called "Where's Waldo?" I will be asked to wait for a signal, find the target figure in each of these drawings, circle it with a marker, and then press a button.

In another part of this building is a group of people who will be trying to telepathically send me the answers to where these figures are so that I can find the figures faster. On some of the drawings, they will be watching me work through closed-circuit TV and trying to help me. On other drawings, they will not be watching because the monitor will be off and they won't be able to see me. When the group is not watching, they won't know the answers to what I'm working on.

I will be asked to do this for fourteen trials, which includes two practice items. I will be presented with fourteen drawings and asked to find one target figure in each. During the trials, the group will signal me that they are ready be sending a chime over a walkie-talkie, and I will signal them that I am done by sending a chime to the group. I promise not to talk over the walkie-talkie, as this will force the experimenters to throw my data away.

I am aware that my participation in this study is completely voluntary, that the information obtained in this study will not be attached to my name in any way, and that I may withdraw my participation at any time without penalty. I am aware that there is a video tape being made for the purposes of making sure that there are no mistakes made by the experimenters or myself that would cause my data to be unuseful. This tape will be destroyed at the end of the experiment. Before I signed this sheet, I asked any questions that I needed to ask to clarify the nature of my participation.

Signature_____Date_____Phone Number_(___)_____

Appendix H: Instruction Script for Experiment

Instructions to Participants for "Where's Waldo?" Experiment Phase
To be read by proctor.

Your participation is really very simple, but please follow these instructions very carefully.

- This walkie-talkie (hold it up) will be the only way for normal communication to happen between the group and yourself. Chimes that sound like this (demonstrate) will be used to let everyone know that a trial is ending or beginning. When the group chimes back to you, it will sound like this: wait or ask for a chime. If you hear any interference or strange noises coming through the walkie talkie, please ignore them. Only pay attention to that chime.
- At the beginning of each trial, the group will send you a chime like the one you just heard. That is your signal to begin. At the end of each trial, you will send the group a chime that will signal them that you are finished. Then you'll wait for another chime telling you that a trial should begin.
- The drawings you will use are here. They are arranged in this book in order so that you cannot see them. Please do not open the book or look at the cards until you hear a chime from the walkie-talkie. Please do not shuffle the cards or change their order in any way. As I explain this, we'll also practice together. Please take this marker. (Tell the group that Practice is beginning.)
- When the first chime sounds, open the book and begin. (Wait for the chime. Flip over a practice card. Have the subject complete this task while you supply these prompts.) There will be a little drawing in a white space on the top margin. This is your target. Try to find it as quickly as you can in the drawing. Go ahead. When you find it, tell me, but don't do anything.
- Now that you have found the target in the drawing, **circle it with the marker**, and **press the chime button** to let the group know you're finished. **This is very important!** (Prompt the subject to do this.)
- **Wait for the next trial to begin with another chime.** The group will chime again when it is time to start, **please wait for that second chime**. (Complete second practice trial.)
- While you are waiting for trials to begin, including the first one, please relax and breathe deeply and consider the group. Think about the fact that there's a group of people here trying to help you with this, even though you can't see them. Try to be open to their help, allow yourself to be aware that they're here and they want you to do well. If you begin to feel frustrated, try to let that frustration go. This is not a test of you. Remember to have fun! This is an unusual chance to participate in some very unusual research! Relax and enjoy yourself!

Appendix I: Experiment Data

Pearson's *r* Comparing Subjects' ASGS Score with Subjects' Mean Difference Between Experimental and Control Conditions

Correlations

		asgs score	MEANDIFF
asgs score	Pearson Correlation	1	.142
	Sig. (2-tailed)	.	.528
	N	25	22
MEANDIFF	Pearson Correlation	.142	1
	Sig. (2-tailed)	.528	.
	N	22	22

T-Test for Differences Between Control and Facilitated Scores Within Subjects

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	C5	18.6718	22	10.82629	2.30817
	F2	16.7382	22	6.60614	1.40843
Pair 2	F5	26.6005	22	26.67716	5.68759
	C1	37.3480	22	31.66659	6.75134
Pair 3	F3	23.5035	22	11.04551	2.35491
	C2	18.2743	22	8.23330	1.75535
Pair 4	F4	24.4184	22	19.27603	4.10966
	C4	22.6491	22	11.49931	2.45166
Pair 5	F1	19.0805	22	12.59291	2.68482
	C3	16.6557	22	7.42978	1.58403
Pair 6	F6	30.1589	22	35.53877	7.57689
	C6	20.3339	22	12.55131	2.67595

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	C5 & F2	22	.314	.154
Pair 2	F5 & C1	22	-.069	.761
Pair 3	F3 & C2	22	.527	.012
Pair 4	F4 & C4	22	.028	.903
Pair 5	F1 & C3	22	.521	.013
Pair 6	F6 & C6	22	.103	.647

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	C5 - F2	1.9336	10.76471	2.29504	-2.8392	6.7064	.843	21	.409
Pair 2	F5 - C1	-10.7475	42.78420	9.12162	-29.7170	8.2220	-1.178	21	.252
Pair 3	F3 - C2	5.2292	9.68825	2.06554	.9337	9.5247	2.532	21	.019
Pair 4	F4 - C4	1.7693	22.17076	4.72682	-8.0606	11.5993	.374	21	.712
Pair 5	F1 - C3	2.4248	10.78128	2.29858	-2.3554	7.2049	1.055	21	.303
Pair 6	F6 - C6	9.8250	36.44470	7.77004	-6.3337	25.9837	1.264	21	.220

Chi-Square Test of Direction of Differences Between Control and Facilitated Scores Within Subjects.

Pair 1: C5 (Stim 8) - F2 (Stim 12)

	Observed N	Expected N	Residual
-1	8	11.0	-3.0
1	14	11.0	3.0
Total	22		

Pair 2: C1 (Stim 13) - F5 (Stim 3)

	Observed N	Expected N	Residual
-1	6	11.0	-5.0
1	16	11.0	5.0
Total	22		

Pair 3: C2 (Stim 15) - F3 (Stim 11)

	Observed N	Expected N	Residual
-1	17	11.0	6.0
1	5	11.0	-6.0
Total	22		

Pair 4: C4 (Stim 6) - F4 (Stim 12)

	Observed N	Expected N	Residual
-1	10	11.0	-1.0
1	12	11.0	1.0
Total	22		

Pair 5: C3 (Stim 18) - F1 (Stim 16)

	Observed N	Expected N	Residual
-1	13	11.0	2.0
1	9	11.0	-2.0
Total	22		

Pair 6: C6 (Stim 9) - F6 (Stim 4)

	Observed N	Expected N	Residual
-1	9	11.0	-2.0
1	13	11.0	2.0
Total	22		

Test Statistics

	CHIPAIR1	CHIPAIR2	CHIPAIR3	CHIPAIR4	CHIPAIR5	CHIPAIR6
Chi-Square[a]	1.636	4.545	6.545	.182	.727	.727
df	1	1	1	1	1	1
Asymp. Sig.	.201	.033	.011	.670	.394	.394

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 11.0.

Chi-Square Test of Direction of Differences Between Control and Facilitated Scores Across Subjects

Frequencies

OVERALL

	Observed N	Expected N	Residual
-1.00	63	66.0	-3.0
1.00	69	66.0	3.0
Total	132		

Test Statistics

	OVERALL
Chi-Square[a]	.273
df	1
Asymp. Sig.	.602

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 66.0.