2017

# The Effects of Belief, Gender, and Setting on a Psi Task

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# The Effects of Belief, Gender, and Setting on a Psi Task

(TITLE)

BY

Alan Jeffrey Hinman

**THESIS**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

Master of Arts in Clinical Psychology

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

2017

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# The Effects of Belief, Gender, and Setting on a Psi Task

Clinical Psychology Master's Thesis 2017

Alan J. Hinman

Eastern Illinois University

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Acknowledgments

First and foremost, I would like to offer my deepest and most heartfelt thanks to Dr. Russell Gruber. Your guidance, friendship, and support has been invaluable, and were it not for my experience working in the lab as an undergraduate student, I'd have likely not pursued a Master's degree in the first place. Regarding this project, thank you for your seemingly infinite patience with me. Special thanks also to my best friends Dallas and Heather Woomer, for their ceaseless, unrelenting, impatience. My sincere gratitude to committee members Dr. Allan and Dr. Mace. Dr. Allan's support and understanding over the years has been instrumental. My thanks also to the numerous research assistants I've had the good fortune to work with over many years. I'd also like to thank countless friends and family members for their support and encouragement, most especially my parents. Without their support, I'd not be the man I am today.

## Abstract

The current study was designed to explore how the variables of belief, gender, and experimenter effects regarding setting influence participants' results on a psi task. Small groups of research assistants and participants acted as senders and attempted to telepathically transmit one of four target locations to individual receivers. Sender and receiver groups were divided by gender, and answered a question on a seven-point scale regarding their belief in the existence of mental telepathy. One run of 16 trials was completed by 53 receivers over six data collection sessions, utilizing a new website designed for the task. It was hypothesized that gender, belief, and the social atmosphere of the experiment had the potential to increase either psi-hitting or psi-missing. Results indicate that, while few group differences were found, far more participants than expected by chance produced extreme scores (scores of 4 or 12 hits out of 16 trials). By a conservative estimate of binomial probability, the odds that our data set shows such a distribution skewed away from the center and towards high and low scores are calculated at $p < .002$. Only female receivers were run on five of the six data collection sessions, and all extreme scores observed happened on these sessions. The odds that this occurred strictly due to chance are calculated at $p = .0003$.

# The Effects of Belief, Gender, and Setting on a Psi Task

Bem (2011) defines psi as "anomalous processes of information or energy transfer that are currently unexplained in terms of known physical or biological mechanisms." He explains that "the term is purely descriptive; it neither implies that such phenomena are paranormal nor connotes anything about their underlying mechanisms." Psi phenomenon include 1) telepathy - "the apparent transfer of information from one person to another without the mediation of any known channel of sensory communication." 2) Clairvoyance (or remote viewing) - "the apparent perception of objects or events that do not provide a stimulus to the known senses." 3) Psychokinesis (PK) - "the apparent influence of thoughts or intentions on physical or biological processes." 4) Precognition (or premonition) - "conscious cognitive awareness (or affective apprehension) of a future event that could not otherwise be anticipated through any known inferential process" (p. 407).

May, Utts, and Spottiswoode (1995) simplify the definition: "In the crassest of terms, [psi is] what happens when nothing else should, at least as nature is currently understood" (p. 196). Watt (1996), in a discussion of methodological issues facing complex systems writes of "a parapsychology whose subject-matter is so ineffable that we have to introduce the neutral term 'psi' in order to describe it without making unwarranted theoretical assumptions" (p. 91).

The simple definitions and explanations above hint at the controversial nature and complexities of psi research. This however is merely the tip of a large iceberg. Bem (2011) provides further insight. He highlights methodological complexities in his study designed to test "precognitive detection of erotic stimuli." Using a computer program

that displays two curtains, participants are told that behind one of the curtains is an image; the other is blank. They are asked to find the image. Unknown to the participants are the inner workings of the software: the computer doesn't pick which curtain has an image until after the participant makes a guess. Ostensibly, the study is designed to test precognition. He explains however, that there are other possibilities. Theoretically, the effect could be based on clairvoyance: If the computer is using a pseudo-random algorithm to determine the placement of pictures, it technically knows, in advance, where the targets will be for every trial, and participants may be, in fact, accessing that information in real-time. Alternatively, using a true random number generator opens the study to PK effects: participants could hypothetically be influencing the random number generator to place the target pictures where they make their guess. He goes on to explain the methods he used to control for these possibilities to prove that the effect he is studying is indeed precognition. A great many researchers do not.

Far more common is the opinion expressed by Schmeidler and McConnell (1958) in relation to their clairvoyance experiments:

> From a logical point of view there are other possibilities beside the obvious one that information traveled directly from the cards to the brain of the subject (clairvoyance). To cite three examples, the information might have come from the thoughts of the assistant as he made up the card list (retrocognitive telepathy), from the memory traces of those thoughts (telepathy or clairvoyance, depending upon the definition), or from the future thoughts of the experimenter as she inspected the card list (precognitive telepathy). Although this kind of theorizing has occupied the attention of some parapsychologists, it need not, in view of our

present experimental ignorance, concern us further here. (p. 23)

The current study, presumably, is a test of mental telepathy: this is the terminology we use with participants. The possibility that we are testing an entirely different phenomenon has not eluded us. For many years, we have theorized that the actual effect could be based on precognition, clairvoyance, psychokinesis, or any combination of these phenomenon. Our thoughts on the subject tend toward those of Schmeidler and McConnell's, and in large part, most of the parapsychology literature: We don't know which phenomenon, for certain, we're studying; we're studying psi.

Utts (1991) writes:

> Parapsychologists often make a distinction between "proof-oriented research" and "process-oriented-research." The former is typically conducted to test the hypothesis that psi abilities exist, while the latter is designed to answer questions about how psychic functioning works. Proof oriented research has dominated the literature in parapsychology. (p. 377)

Utts argues that "A promising direction for future process-oriented research is to examine the causes of individual differences in psychic functioning" (p. 377). Process-oriented research has been ongoing; the sheer number of variables that seem to influence psi functioning (discussed in greater detail below) are overwhelming. How these distinct variables interact is, in large part, unknown. Add to that fact the idea that, a great deal of the time, researchers are not even entirely sure what phenomenon they're studying, and the overall picture of psi gets even more muddled.

A brief example of the difficulties involved: as will be discussed in detail below, Dunne (1998), studying the variable of gender, in the context of a psychokinesis

experiment where participants influence a random number generator (RNG), finds that women, without intending to, influence the baseline results on an RNG. Men do not. This raises a number or interesting questions: is this finding applicable to other phenomenon? Could women skew baseline chance expectation, by their simple presence, in a telepathy task, for example? Is this finding indicative of a greater sensitivity to psi effects, or does it say more about the nature of intention in general and hint at gender differences? Furthermore, it has been pointed out (see May, Radin, Hubbard, Humphrey & Utts, 1985) that this type of experiment could, theoretically, not be about PK. The results found could be based on precognition.

Psi researchers then, encounter numerous difficulties. Process-oriented research has shown that there are a great number of variables that may or may not influence participants' results in a psi task. How these variables interact with each other is, in large part, unknown. Whether the process-oriented research that has been done is applicable to psi in general, or limited in scope to only the specific phenomenon studied is, in large part, unknown. Finally, a great deal of the time, we don't even know what phenomenon we're studying: thus, 'psi'.

As a number of elements that will be discussed below relate directly to the current study, a very brief examination of our methodology here is pertinent. It was hypothesized that a game-show like format, and the use of a monetary incentive, creating a sense of competition or challenge, could increase either psi-hitting or psi-missing. Additionally, it was hypothesized that dividing groups of senders and receivers based on gender could produce a similar effect: specifically, we assumed that female receivers, being introduced to all-male sender groups would be more likely to feel uneasy and score lower than other

groups. Fifty-three undergraduate students were used as receivers over six data collection sessions, with 45 students used as senders. Prior to each data collection session, students enrolling in the study were divided by gender, and told to report to one of two rooms on the third floor of the physical sciences building at Eastern Illinois University, our initial plan being to analyze all possible gender-pairing conditions: men sending to women, men sending to men, women sending to women, and women sending to men. Data concerning participants' belief in psi phenomenon was collected using a seven point Likert scale. Utilizing a new website designed specifically for this study, participants then undertook a psi task: senders, viewing a 'hit' and 'miss' location on a screen with four circles, attempted to telepathically transmit this location information to receivers. Receivers, viewing a screen of four blank circles, attempted to guess the location of the 'hit.' Scores above chance expectation resulted in participants earning two dollars per hit above chance. Of specific interest for the current study are three variables: gender, belief, and experimenter effects. A brief examination of theory, and the principle of psi-elusiveness will also be discussed.

*Theoretical Foundations for Psi Functioning*

Central to the question of "how might psi work?" is the concept of quantum entanglement: "The quantum theory prediction that under certain circumstances particles that appear to be isolated are actually instantaneously connected through space and time—is not only known to be demonstrably real, but is far more pervasive and robust than anyone had imagined even a few years ago" (Radin, 2004, p. 11).

According to Erickson (2011):

At the quantum particle level, all separateness disappears and everything is

> connected. Schrödinger described this process as "entanglement." Einstein more descriptively called it "*spukhafte fernwirkung*" or "spooky action at a distance." He believed that quantum entanglement would someday be seen as a mathematical error in calculation. Instead, scientists continue to be baffled by repeated discoveries at the subatomic level that simply do not subscribe to the previously-known laws of physics. (p. 145)

In essence, it's a fairly accepted idea that particles can transmit information instantly over vast distances. In 1935- in an effort to partially address this- Albert Einstein, Boris Podolsky, and Nathan Rosen collaborated on a paper questioning whether the current description of quantum mechanics could be considered complete, with this observed phenomenon of entanglement apparently violating the theory of relativity (information being transmitted faster than the speed of light). They concluded: "While we have thus shown that the wave function does not provide a complete description of the physical reality, we left open the question of whether or not such a description exists. We believe, however, that such a theory is possible" (p. 780). This is now generally referred to as the EPR paradox. (Einstein et al. 1935)

Although the authors of the EPR paper were not willing to propose new theories to explain entanglement, Radin has. He has put forth a theory he calls entangled minds (also the title of his book), in which he posits that, in the same way subatomic particles can become entangled, so too can human minds. Research showing evidence of this has been ongoing since 1965, and lends credence to his claim that "a rational framework for psi may be taking shape" (2004, p. 14).

The first such study, conducted in 1965, tested 15 pairs of identical twins. Subjects were placed in separate rooms, and EEG data was collected. One twin was instructed to close their eyes, in order to induce an alpha rhythm. In two out of the 15 pairs, the alpha rhythm was also detected in the sibling in the opposite room. While this experiment was not specifically designed (at least by any mention of the authors) to test EPR-style quantum entanglement, and only mentions extrasensory perception/induction, it did lay the groundwork for a persisting methodology of a series of experiments focusing directly on quantum entanglement in the human brain. (Duane & Behrendt, 1965)

In 1994, researchers paired participants that had not yet met. In prior iterations of the experiment by the same group of researchers, a protocol had been developed to "correlate brains"- participants were "introduced to each other inside the stimulation chamber with instructions to get to know and then to feel one another in meditative silence for 20 minutes" (p. 423). EEG data was collected in two testing conditions. The first testing session took place before the participants had met one another and meditated. The second session was conducted immediately after meditation, and without the participants interacting with anyone else. In each condition, subjects were placed in separate, electromagnetically shielded rooms. One subject of the pair was then exposed to a series of 100 flashes at random intervals, while the other sat quietly with their eyes closed. They found that, in condition two, after meeting and meditating, 25% of participants showed remarkable similarity in their EEG data ($p < .009$). These similarities were not found in condition one. They remark that "the striking similarity between the transferred and evoked potentials and the total absence of transferred

potentials in the control experiments leaves no room for doubt about the existence of an unusual phenomenon, namely, propagation of influence without local signals" (Grinberg-Zylberbaum, Delaflor, Attie, & Goswami, 1994, p. 424).

Researchers at the Bastyr University/University of Washington (Standish, Kozak, Johnson, & Richards, 2004) conducted a similar study to replicate Grinberg-Zylberbaum's findings. After successfully replicating the study (correlated EEG readings in five out of 60 subjects, $p = .0005$) they then wondered if the same results could be found in a functional MRI (fMRI) study. They paired two subjects, colleagues of two years, who "spent 10 minutes with each other in meditative silence before the start of the experiment" (Standish et al, 2003, p. 128). One subject (the receiver) was then placed in an fMRI machine, wearing a pair of goggles that displayed a static checkerboard pattern. The sender sat in an isolated room (electromagnetically shielded from the receiver's room) and viewed either a static or flickering checkerboard pattern, and was instructed to "fixate at the center of the video monitor and to attempt sending an image or thought to his or her partner" (p. 122). After fMRI data were collected, the subjects traded places, and the experiment was repeated. The data collected shows that "a signal was detected in the brain of a distant member of the pair when the brain of the other member was visually stimulated" (p. 123). The authors conclude:

> The brain activity observed in the visual association cortex suggests that the receiver "processed" a signal from the sender. Because Subject 1 (as receiver) was electrically, magnetically, acoustically, and visually shielded from Subject 2 (as sender), the mode of transmission for this signal is presently unclear. Whatever the physical nature of the signal, this case report suggests that living

> brain tissue detects this signal. The underlying mechanism of this phenomenon, first described in EEG, and now in fMRI, remains to be explained. (Standish et al, 2003, p. 123)

Quantum entanglement is certainly not the only theory. The concept of morphogenetic fields has been around for a century. Sheldrake, in 1981, hypothesized his theory of morphic resonance. Goswami (1997) explains the concepts involved eloquently and concisely:

> Morphogenesis -- the growth of form from a single cell embryo -- is a problem of biological order of unprecedented precision timing of correlated events of both spatial and temporal nature. One doesn't see anything like this in dealing with inanimate matter. Naturally, beginning with Erwin Schrodinger, an impressive group of scientists have suggested that the currently known laws of physics may not be enough to explain morphogenesis. Many biologists have propounded the idea of a morphogenetic field -- a condition of space that retains the memory of the form that the embryo evolves towards under the guidance of the fields. But these earlier works hold on to the concept of local fields and also to the materialist belief in "upward causation" -- the supremacy of matter as the cause of everything.
>
> But morphogenesis has overtones of teleology (the idea that some final purpose is driving the system) to many. And the biologist Rupert Sheldrake has injected new principles in the old idea of morphogenetic fields to incorporate teleology, non-locality, and downward causation. His morphogenetic fields are purposive and non-local. They are not material. They are capable of downward

> causation in matter through a new principle called "morphic resonance". According to Sheldrake, as soon as a new form comes about, it sets up its own field which is continually reinforced with its ongoing replication, thus explaining the memory exhibited in morphogenesis. (p. 1)

Sheldrake's theories have proven to be extraordinarily controversial, and while there are numerous parapsychology studies aimed at demonstrating a memory property to morphic fields, I'd instead like to strip Sheldrake's theory down to its most basic principles, and discuss their implications, and the rather compelling body of research that seems to support (at least the basics of) his theory.

Morphogenetic fields are just one type of morphic field. In a recent presentation (Sheldrake, 2015), he includes mental, behavioral, and social fields as examples of other types of morphic fields. The most basic interpretation then, of Sheldrake's theory is as follows. Fields (whatever and wherever they may be)- containing information- exist. Human beings (from the moment of conception, out of necessity) can tap into these fields. An inherent ability then, to tap into a field of information, might well hint at an explanation as to how psi might function.

Surprisingly enough, research conducted at the Heartmath Institute demonstrates that the brain may not be the only mechanism involved. Researchers (McCraty, Bradley, & Tomasino, 2004) have found that “the heart is a sensory organ and a sophisticated center for receiving and processing information” (p. 15). Aside from the obvious neural communication, they have found that “the heart also communicates information to the brain and throughout the body via electromagnetic field interactions” (p.16). They write:

> The rhythmic beating patterns of the heart change significantly as we experience different emotions. Negative emotions, such as anger or frustration, are associated with an erratic disordered, incoherent pattern in the heart's rhythms. In contrast, positive emotions, such as love or appreciation, are associated with a smooth, ordered, coherent pattern in the heart's rhythmic activity. In turn, these changes in the heart's beating patterns create corresponding changes in the structure of the electromagnetic field radiated by the heart. (p. 16)

They have demonstrated that this electromagnetic field can interact with the "heart fields" of others, or even synchronize to another person's brain waves. Their results have led them to conclude that "the nervous system acts as an "antenna" which is tuned to and responds to the electromagnetic fields produced by the hearts of other individuals" (p. 17).

Research into transplant patients has shown that following a heart transplant, a number of recipients exhibit personality changes that reflect the personality of the donor (Pearsall, Schwartz, & Russek, 2002). The ideas presented above – that fields of information exist that are accessible to human beings, and that the heart may play a large role in that process – seem well illustrated by the following story, presented in Pearsall's book, The Heart's Code:

> I recently spoke to an international group of psychologists, psychiatrists, and social workers meeting in Houston, Texas. I spoke to them about my ideas about the central role of the heart in our psychological and spiritual life, and following my presentation, a psychiatrist came to the microphone during the question and answer session to ask me about one of her patients whose experience seemed to

substantiate my ideas about cellular memories and a thinking heart. The case disturbed her so much that she struggled to speak through her tears.

Sobbing to the point that the audience and I had difficulty understanding her, she said, "I have a patient, an eight-year-old little girl who received the heart of a murdered ten-year-old girl. Her mother brought her to me when she started screaming at night about her dreams of the man who had murdered her donor. She said her daughter knew who it was. After several sessions, I just could not deny the reality of what this child was telling me. Her mother and I finally decided to call the police and, using the descriptions from the little girl, they found the murderer. He was easily convicted with evidence my patient provided. The time, the weapon, the place, the clothes he wore, what the little girl he killed had said to him . . . everything the little heart transplant recipient reported was completely accurate. (p. 7)

*Psi-Elusiveness*

One of the problems facing the field is the sheer number of variables involved in predicting psi performance. Marilyn Schlitz (Schlitz and Honorton,1992) has demonstrated that "artistically gifted" (Julliard students) score well. Kennedy (2001) posits that "Psi depends on special psychological conditions or states of consciousness" (p. 224), and cites high motivation and enthusiasm, attention without distraction or boredom, an atmosphere of spontaneity, or an altered mental state like hypnosis. The current study at Eastern Illinois University focuses on differences in gender, belief in psi, and experimenter effects. Research at the Heartmath Institute (McCraty and Childre, 2010; Morris, 2010) focuses on the idea of coherence, brought about by positive

emotions. Bem and Honorton (1994) discuss personality traits of receivers (extraversion/introversion), differences in targets (static vs. dynamic-and how much information the target contains), and the social atmosphere of the experiment. They further claim that "virtually nothing is known about the characteristics of a good sender, or about the effects of the sender's relationship with the receiver" (p. 15).

Braud (2012) points out that, as we don't know how psi really functions, it's rather odd that we assume that information gained telepathically would be redundant with information we could receive visually. We think of psi as a sixth sense, but nearly all of the research in the field is based on visual targets. He writes:

> Nature has provided us with different senses for different types of information. Perhaps Nature's bequest of psi provides us with the possibility of still other forms of information or knowledge. For things to be otherwise would be just as maladaptive as would the possession by a human being of five pairs of ears, but no eyes, nose, tongue, or touch organs. Of what use is psi if it does only what the senses do? (p. 85)

Further complicating the litany of potential variables, and our lack of understanding of them, is the idea that psi is, by its very nature, elusive. Kennedy (2003) remarks that a "seemingly capricious or defiant psi manifestation is when the overall intended effect becomes nonsignificant, but unintended secondary effects provide evidence for psi" (p. 55). Lucadou, Romer, and Walach (2007) write: "When one tries to pinpoint psi phenomena, they show a tendency to disappear, where they are sought for and to surface at some other unexpected place" (p. 53). With this phenomenon in mind, even the information we do have regarding the potential effect of all these variables is called into

question. The argument could simply be made that the real effect we're seeing is an elusive one, and not dependent on the variable(s) we think we're testing.

Stanford (2003) proposes that researchers "should consider that the most fundamental key to replication – and, more generally, to prediction and control – in any field is conceptual advancement, which means research-based understanding of the mechanisms underlying the phenomena" (p.17). This seems to be precisely what is lacking in the field of psi research. There are only two ideas that the field seems to truly have come to a consensus on: psi effects exist, and they are elusive.

Bem and Honorton (1994) discuss a previous study (Schlitz and Honorton, 1992) that was designed to test creative (Juilliard) students. In the original study, the authors write: "We attempted to create a friendly, informal social atmosphere" (p. 88). In their discussion of this study, Bem and Honorton reveal that a (unnamed in the article) reviewer of the original study wrote "Until Bem and Honorton can provide operational criteria for creating a warm social ambiance, the failure of an experiment with otherwise adequate power can always be dismissed as due to a lack of warmth" (p. 14). This strict adherence to quantitative measures may be hindering our understanding of psi. If a shift toward a more qualitative analysis were to happen in the field, and we could improve our understanding of the variables involved, that understanding could then be better applied to future research.

Reading through any number of current research studies, it's easy to wonder what variables are actually being tested. With the plethora of potential variables that may be influencing psi performance, there aren't any studies out there that isolate and measure all of them. Researchers often fall back to this idea that psi is elusive. Yet over 25 years

ago, in 1989, Honorton and Ferrari wrote the following conclusion regarding a meta-analysis conducted on over 50 years of precognition studies:

> The most important outcome of the meta-analysis is the identification of several moderating variables that appear to covary systematically with precognition performance. The largest effects are observed in studies using subjects selected on the basis of prior test performance, who are tested individually, and who receive trial-by-trial feedback. The outcomes of studies combining these factors contrast sharply with the null outcomes associated with the combination of group testing, unselected subjects, and no feedback of results. Because the two groups of studies were conducted by a subset of the same investigators, it is unlikely that the observed difference in performance is due to experimenter effects. Indeed, these outcomes underscore the importance of carefully examining differences in subject populations, test setting, and so forth, before resorting to facile "explanations" based on psi-mediated experimenter effects or the "elusiveness of psi."
>
> The identification of these moderating variables has important implications for our understanding of the phenomena and provides a clear direction for future research. The existence of moderating variables indicates that the precognition effect is not merely an unexplained departure from a theoretical chance baseline, but rather is an effect that covaries with factors known to influence more familiar aspects of human performance. It should now be possible to exploit these moderating factors to increase the magnitude and reliability of precognition effects in new studies. (p. 301)

Unfortunately, 25 years later, there seems to be no indication that this idea- the identification and exploitation of moderating variables - was ever really applied anywhere. Nor did it translate from the realm of precognition studies over to other areas of psi research. Instead of accumulating knowledge, information in the field remains fractured, arguments abound (between believers and skeptics, and researchers themselves), and progress into understanding psi is frustratingly slow.

Kennedy (2003) discusses the idea that psi effects occur more frequently in situations with less methodological quality. He offers two explanations. The first being that a common trend in any line of research is a shift toward greater methodological quality over time. As decline effects in psi over time have been noted by a number of experimenters, there could simply be a non-causal correlation. The other explanation is that psi, being elusive, occurs more readily in situations where it can't be pinned down and fully explained. He writes:

> The idea that psi effects are inversely related to experimental sophistication needs to be evaluated. The notable lack of comparative studies in some of the most successful lines of psi research appears to indicate that parapsychologists have tacit, working assumptions favoring simple, unrevealing experiments (perhaps as a result of operant conditioning by actively evasive psi). (p. 58)

*Experimenter Effects*

White (1976) describes the experimenter effect as "the response of subjects to the needs and wishes of the experimenter or to factors in the experimental situation other than those to which the experimenter has overtly instructed them to respond" (p 333). Parker (2003) describes the experimenter effect as "the most reliable and replicable

finding in parapsychology" and also notes that "It should be emphasized. . .that the effect cannot explain the psi-effect if all the controls are in place" (p. 47). Palmer (1986) heralds the experimenter effect as "the most important challenge facing modern experimental parapsychology. It may be that we will not be able to make too much progress in other areas of the field until the puzzle of the experimenter effect is solved" (p 220-221).

A number of studies (Wiseman and Schlitz, 1997; Watt and Wiseman, 2002; Watt and Ramakers, 2003; Smith, 2003) have been conducted to examine psi-conducive vs. psi-inhibitory experimenters, and to assess their characteristics. The results are rather intriguing. Wiseman and Schlitz, for instance conducted the same experiment at the same university drawing from the same subject pool. The only real difference then, was the experimenter. Wiseman is "a skeptic regarding the claims of parapsychology who wished to discover whether he could replicate the effect in his own laboratory", whereas Schlitz is a "psi proponent who has previously carried out many parapsychological studies, frequently obtaining positive findings" (p. 198). They tested the remote detection of staring in participants based on electrodermal activity. The found that "subjects run by [Wiseman] did not respond differently to stare and non-stare trials. In contrast, participants run by [Schlitz] were significantly more activated in stare than non-stare trials" (p 204).

A great deal of experimental evidence like this suggests that experimenters themselves can influence the outcomes of their studies. As it is no great logical leap to classify Dr. Gruber as a psi-conducive experimenter (with semester after semester of highly statistically significant findings), I'll not explore this phenomenon in depth. I'd

instead like to focus on the other side of White's definition of the experimenter effect– factors in the experimental situation– an extremely loose definition that could seemingly cover any number of variables. It should first perhaps be stressed that White (1976) makes the following very important distinction:

> The reader should keep in mind that, depending upon the circumstances of the research being described, the term "experimenter" . . .can designate either the primary experimenter-the person who conceives, designs, and is responsible for the experiment-or any other person involved in it as a data collector, checker, observer, etc. (p. 334)

Dr. Stephen Morris, a researcher at the Heartmath Institute, conducted a study in 2010 that may have profound significance to the field of psi research, and offer insight into the complexities of the experimenter effect, using Heartmath's measure of heart rate variability coherence (HRVC). Fifteen participants underwent an eight-week training program and were taught to achieve high levels of HRVC, and functioned as the senders for the experiment. Fifteen additional untrained participants served as receivers. It was hypothesized that senders could facilitate the process of achieving high HRVC in untrained receivers. Overall, this was found to be true, and Morris remarks “receiver HRVC was indeed enhanced when senders were in a more coherent state themselves” (p. 70). However, the other findings of the study are more indicative of the various complexities of the experimenter effects rampant in psi studies.

Morris's experiment consisted of 148 10-minute trials, across six different experimental conditions. Senders were given one of three instructions: achieve, send, or relax. In the achieve condition, they were to “achieve a state of high HRVC with no

attention directed to the receiver." In the send condition, they were to "achieve high HRVC with care and compassion–infused facilitation directed toward the receiver." Finally, in the relax condition, they were to "sit quietly with no attention directed to the receiver" (p. 63). Receivers were likewise divided into two conditions: achieve or relax. While the receivers were untrained in achieving high HRVC, a cue card gave brief instructions. All the participants for the study were school teachers and administrators from the International School of Singapore. Each participant was asked to "rate the state of their interpersonal relationship with each other trial participant using a 10-point Likert scale" (p. 64). These ratings were also summed for each group to obtain a "measure of the group's overall comfortability and friendliness" (p. 64). Additional measures were taken on participants' emotional states.

Morris notes that "receiver HRVC scores were seen to be highest when senders were merely relaxing while receivers were attempting to achieve coherence on their own" (p. 70). Additionally, "mean receiver HRVC was lower when senders were trying to facilitate it" (p. 70). It would appear that sender intention plays a part in transmission of a psi signal, as do relationships. Morris suggests that "trying too hard to facilitate coherence in someone else might actually be counter-productive" (p. 70). He also writes:

> It seems as though, in some cases, the senders and receivers may not have been working in tandem and may have even been working across purposes in as far as achieving high coherence is concerned. This was subsequently verified by post-trial interviews and in the interpersonal relationship ratings. Participants who did not share some degree of fondness toward each other were less likely to achieve coherence in a group setting. (p. 70)

He concludes:

> The sender-receiver circuit can best be understood as a dynamic two-way channel that can be influenced at any time by either party. In the original research design it was naively assumed that senders could influence receiver HRVC unilaterally and without receiver permission. This appears not to be the case in fact, as . . .results indicate that the quality and extent of the interpersonal relationships between participants matters more than the actions and intentions of the senders. Two implications for future research should be clear: (1) that receiver's mental and emotional condition should be a control variable as well as the sender intention and (2) that fostering strong relationships will likely foster greater levels of group and individual coherence. (p. 70)

Given the ideas discussed previously, it seems a logical assumption that Morris' findings should be applied to psi research as a whole. That sender intention, emotional state, and interpersonal relationships would be a factor exclusive to this specific task (i.e., transmission of heart rate variability through electromagnetic facilitative fields) seems implausible. It follows then, that a great deal of the research in the field that doesn't assess these variables is being influenced by them.

*Gender*

The variable of gender in psi research is, unfortunately, one that is somewhat overlooked. Some of the information that does exist however, comes from the Princeton Engineering Anomalies Research (PEAR) lab. The PEAR lab, operating for 28 years, conducted a series of experiments utilizing numerous random number generators. Brenda Dunne, the lab's manager explains that "all of these human/machine experiments involve

carefully calibrated devices based on well-understood physical processes, each capable of rapidly generating, displaying, and recording extensive sequences of random events" (1998, p. 3). These studies are, presumably, testing a psychokinesis effect. "Volunteer human operators attempt, solely through conscious effort, to shift the output distribution means of these devices to higher or lower counts, or to generate an undisturbed baseline, in accordance with pre-recorded intentions" (p. 3).

While delving into the massive amount of data from the PEAR labs 28 years of operation is well beyond the scope of this paper, a brief look at some of the conclusions drawn relating to the variable of gender is pertinent, as gender is one of the main focuses of the current study. It was noted that both males and females display greater success at the high-intention efforts than at the low. However, while a majority of the males also succeed at the low-intention effort, most of the females' low-intention efforts are opposite their intention. Additionally, Dunne writes that "consistent with chance expectations, only 52% of the males produce baselines above the theoretical mean, in contrast with a significant proportion (66%) of the females" (p. 15).

These results raise a number of interesting questions. Many of the operators, primarily the females, are "producing distortions in the baselines, which are ostensibly non-intentional control conditions" (p.54). Dunne posits that this may suggest that "these anomalies may be associated with some deeper level of consciousness, one more closely identified with the brain's limbic functions than with its cognitive ones." Additionally, it appears that "intention may be only one contributing component of these phenomena, and that the ability of an individual to establish a resonant bond with another, or with a machine, may be a factor of comparable, or even greater, consequence" (p. 53).

Also included is the ever-present psi research disclaimer that an attempt to interpret this without considering other variables like "individual information-processing strategies, sociological expectations, technological sophistication, or personal belief systems, as well as a myriad of potential cultural and environmental factors that might influence performance in a task of this nature, will probably fall short of full understanding" (p. 54).

Perhaps of even greater relevance to the current study is the 1993 study that inspired this more in-depth look at the gender variable. In contrast with the vast majority of the PEAR lab's studies, where a single operator was used, Dunne tested pairs of operators: eight same sex pairs, and seven opposite sex pairs- four of which were "bonded" couples. She writes: "some of our most successful individual operators produce null effects when working together, while others with minimal or even negative results are able to produce strong positive yields as a pair" (p. 4). The results of the same-sex pairs were found to be non-significant, though they tended to be opposite of intention in both the high and low conditions. On the other hand, she found that opposite-sex pairs "produce results consistent with their intentions, with effect sizes considerably larger than those of the single operator results" (p. 5). Results for the four pairs in a "bonded relationship" are even stronger: nearly twice as strong in the high intention, and nearly 2.5 times as strong in the low intention. Despite the relatively small amount of data, finding such statistically significant results suggests that "gender-pairing is a complex parameter in consciousness-related anomalies research, (p. 1)" though exactly how it works is not understood.

Radin (2004) has conducted a series of experiments studying "electrodermal

presentiments of future emotions." Utilizing photographs designated as either calm or emotional, participants' electrodermal activity (EDA) was measured prior to, and during the presentation of these photographs. Results indicate that, prior to the presentation of emotionally charged photographs, an arousal of the autonomic nervous system can be detected. He remarks that "this series of four experiments, supported by successful replications conducted by other investigators, appears to demonstrate a small magnitude but statistically robust form of precognition in the human autonomic nervous system" (p. 253).

Bierman and Scholte (2002) conducted a similar study to replicate these findings with fMRI. Studying various regions of the brain, they found that "anticipatory activation preceding emotional stimuli is larger than the anticipatory activation preceding neutral stimuli. For the male subjects this appeared before the erotic stimuli while for the female both erotic and violent stimuli produced this anomalous effect" (p. 25).

Further evidence indicative of gender differences relating to intuition are offered by McCraty, Atkinson, and Bradley (2004a, 2004b). While a truly in-depth analysis of their many findings here is unwarranted, their findings that women process pre-stimulus information in different areas of the brain than men (frontal, in women, as opposed to posterior, in men), and the differences they observed in heart rate acceleration/deceleration prior to stimulus exposure lead them to conclude that "taken as a whole, these findings suggest that females are more attuned to information from the heart, especially when the coherent mode is activated" (p. 334).

*Belief*

Many studies have been conducted in an attempt to understand how the variable

of belief effects psi performance (see Haraldsson & Houtkooper,1995; Palmer, 1971; Palmer, 1972, Palmer, 1977). In a study done at Harvard from 1942-1945, Schmeidler and Murphy coined the terms sheep and goats to describe participants' belief in ESP. "The subjects who accepted the possibility of ESP under the conditions of the experiment were called sheep; the others were called goats" (Schmeidler & McConnell, 1958, p. 24). They elaborate on the various gradations of belief and how participants were classified. They discuss the possibility (that was subsequently ruled out) that "a subject who accepted the possibility of paranormal success under some conditions, but not under the conditions of the experiment, would have been classed (incorrectly) as a sheep." They go on to describe "one subject who accepted the possibility of telepathy but not of clairvoyance and who was (correctly) classified as a goat." They also clarify that "a subject might believe that, although others could employ ESP in the given experimental situation, he himself could not. By definition, such a subject is a sheep" (p. 26). After separating participants into these two categories, and hypothesizing that sheep would score higher than goats, they conducted a clairvoyance oriented card guessing experiment. They describe the results of three series:

> Although there were individual variations in scores, the overall data of these first subjects were clearly in the direction suggested by the hypothesis. When the difference between ESP scores of sheep and goats had reached the .03 probability level of significance, it was decided to begin a second series of subjects. The second series was to include, as nearly as possible, the same number of subjects and the same number of runs as the first series; and the subjects were to be tested under the same conditions. Their results were roughly similar to those of the first

> series. A third series was then instituted, and again the attempt was made to keep the experimental conditions, the number of runs and, so far as possible, the number of subjects, the same as in the other series. When this series, which also gave similar results, was completed, it was found that the pooled data of the three series showed a difference between average ESP scores of sheep and goats which was at the .005 level of significance. (p. 26-27)

The sheep/goat variable has been widely studied since Schmeidler's initial findings. In a meta-analysis of 73 studies conducted by Lawrence (1993), for example, it was found that sheep perform better than goats at odds greater than a trillion to one (combined Stouffer $z = 8.17$, $p = 1.33 \times 10^{-16}$).

Of perhaps more relevance to the current study is the concept of influencing belief scores within an experimental setting (see Smith, Foster, and Stovin, 1998; Storm and Thalbourne, 2005). Walsh and Moddel (2007) describe an experiment where, after identifying the subjects as either sheep or goats, they attempt to manipulate those beliefs in an attempt to "assess whether innate ability is the primary factor in psi performance, with belief resulting from it, or whether the belief itself is an independent factor in the performance" (p. 502). Participants were chosen randomly, by coin flip, to receive pro-psi or anti-psi arguments on fact sheets that contained general and scientific data. Their results show that the only group to achieve statistical significance against chance expectation were the believers provided with pro-psi arguments. They conclude:

> In summary, previous research has shown that believers tend to out-perform nonbelievers on psi-tasks. In the present experiment, we attempted to manipulate such beliefs using written and verbal arguments so as to influence subjects'

> success rate in a psi task. Believers who received positive reinforcement performed significantly better than chance, and better than groups who were doubters or who received anti-psi arguments. This supports the idea that belief gives rise to successful psi performance, as opposed to innate psi ability giving rise to belief. (p. 506)

The ideas presented above have a number of implications that directly relate to the current study: gender, belief, reinforcement of belief, and experimenter effects as they relate to the setting of the experiment are all factors that can influence participants' results in a psi task. Additionally, there exists the argument that psi is an elusive phenomenon that can be difficult to pin down. How these factors covary in any given experiment is relatively unknown. Our interest then, is in isolating individual factors that contribute to psi performance in an effort to better understand the phenomenon, leading to improvements in methodology that could, in the future, be applied elsewhere.

## Method

### *Participants*

Participants for the study were comprised of 98 undergraduate students enrolled in the introductory psychology course at Eastern Illinois University. Fifty-three students served as receivers, while 45 students served as senders. Participation in the study fulfilled a course requirement for the introductory class in which they were enrolled.

### *Materials*

Materials for the study consisted of two computers, two video projectors, a video camera, two video monitors, an amplifier, a standard doorbell, a buzzer, a control box with buttons to ring the doorbell and buzzer, HDMI cable, speaker wires, coaxial cable,

cat-5 ethernet cable, two white foam boards (20" x 30") marked with four seven-inch circles, and five seven-inch red foam discs, affixed to the boards with Velcro.

Numerous printed documents (see appendix A) were also used in the study: a consent form; a debriefing form; two scripts- one to be read by research assistants in the sender room, one to be read by research assistants in the receiver room; two brief instructions forms- one for participants in the sender group, one for participants in the receiver group; a belief and demographics form; and a friendliness/enthusiasm rating scale.

Finally, a website was developed for running participants. The website, at the stage of development it was in at the time of this study, automated a number of tasks that, in prior versions of the experiment, were done manually by research assistants (see appendix B).

*Procedure*

A team of six research assistants configured all the equipment for, and conducted all aspects of the experiment. Four rooms on the third floor of the physical sciences building, located on the Eastern Illinois University campus, were utilized for the study. These rooms were designated as the receiver room, the monitor room, the sender room, and the waiting room.

The receiver room, located inside a suite of rooms, with no windows, has a wall mounted video camera in one corner. A computer was placed on a table in the center of the room. The video feed from the camera runs into the monitor room. HDMI cable, ethernet cable, and speaker wire were also run to the monitor room to provide a duplicate output from the computer monitor directly into the monitor room, internet access, and

signaling capabilities to the doorbell and buzzer placed inside the receiver room.

The monitor room, inside the same suite of rooms, thus had a video feed of the receiver room, a video feed of the computer that receivers use (the video feed from the wall mounted camera isn't of high enough quality to distinguish details of the computer monitor directly-being able to observe mouse movements aided in the recording process), and the ability to signal receivers with a bell or buzzer. The same video feed from the camera was routed through an amplifier; coaxial cable was run approximately 120 feet down the hallway to the sender room.

The sender room was set up with two video projectors and a computer. The video feed from the receiver room was projected onto a wall. The computer in the sender room was connected to the second projector, and displayed on the wall next to the video feed. Chairs, facing the wall with the two displayed feeds, were arranged around a table in the middle of the room for senders to sit in.

Participants, having signed up for the study online, were instructed to come to one of two rooms used in the study. Six data collection sessions were conducted over a three-week period. Participants designated as senders reported to the sender room. Those designated as receivers reported to the waiting room. These designations were assigned in advance based on gender

Upon arrival, participants were greeted by the research team, who confirmed that they were, in fact, there for the experiment, and asked to wait until the study commenced. Research assistants, also divided into groups based on gender, made an attempt each night to begin the explanation of the study to the two separate rooms at roughly the same time.

Though minor differences appear in the scripts for receivers and senders, and the associated brief instructions forms, the basic explanation was the same for each group. Research assistants read through the script and began explaining the experiment, and first passed out the consent form and the belief question and demographics form.

The consent form contained a brief explanation of the study. Participants were asked to read through it, sign, and then flip it and answer the belief question and demographics on the back. The belief question was a seven-point Likert scale, with one representing their belief that telepathy is "very unlikely to exist" and seven representing "very likely to exist." It should perhaps be noted that in prior versions of the experiment, an additional step was taken at this point. Participants who circled four – the middle of the scale – were asked to then draw an arrow toward one end of the scale, in an effort to determine which way their belief leaned to. For this study, instead of this, the research assistant reading the script instead said, in an effort to steer participants away from choosing four, "think about this and try to make a decision one way or the other."

After collecting these forms, research assistants explained the experiment in-depth. Instruction forms were passed out to each group, so that they could follow along. The website that was developed for this experiment was modeled on the white foam boards and red foam discs that were used in prior versions. Research assistants in each room used these boards and discs to explain how the website works. After this explanation, a mental telepathy tips sheet was handed out, that offered potential strategies to employ to facilitate hitting the target.

In the waiting room, where the experiment was explained to the receivers, consent forms were shuffled, and a single receiver was chosen at random to start the experiment.

Before being taken to the receiver room, a research assistant escorted this participant down the hall to the sender room. There, the receiver was very briefly introduced to the room of senders, and shown the room's layout, and the video feeds displayed on the wall. No attempt was made by the research team to mitigate the potential awkwardness of this very brief introduction. After being introduced and shown the room, the research assistant then escorted the receiver back down the hall to the receiver room, usually saying something as simple as "okay, let's go."

Once inside the receiver room, participants were seated at the computer and told they could begin immediately. The research assistant escorting them would then shut the door and return to the monitor room.

The front page of the site has a 'join' button. After pressing join, and entering your name, age, and belief score, you're taken to a blank screen displaying the message "Please wait for another player to join!" Once another player joins, the experiment begins.

The first player that joins is the sender. The second to join is the receiver. Once the second player has joined, the experiment begins immediately. The sender's screen displays four circles- top left, top right, bottom left, and bottom right. We designate these positions: 1) top left 2) top right 3) bottom left and 4) bottom right. The website randomly selects one of these positions as a 'hit' and another as a 'miss'. The word hit is surrounded by a green background, while the word miss is surrounded by a red background. The two remaining positions are left blank. On the sender screen, the 'hit' and 'miss' locations are displayed. Five seconds after displaying this screen to the sender, the receiver's page displays only four blank circles. At this point, the receiver can click

on any circle. Clicking on an empty circle (as it appears to the senders) results in the circle being filled in gray on both the sender and receiver screens. The receiver can then choose another circle. An empty circle will again turn gray. Clicking on the 'hit' location will reveal, to both the senders and receiver, that a 'hit' was scored when the circle is filled in entirely green. Clicking on the 'miss' location has the same effect, and the circle is filled in entirely red. After a hit or miss is scored, the image remains on both screens for five seconds. After scoring a hit, participants were signaled with a bell tone. Following a miss, the buzzer was sounded. The next trial would then begin with the sender screen once again displaying hit and miss locations five seconds in advance of the receiver's screen (a blank screen is displayed to the receiver in the interim). This process repeats for 16 trials.

After the sixteenth trial, the website displayed that the run was over, and the participant was signaled with 3 bell tones, indicating that their run had concluded. A research assistant then escorted them back out of the receiver room and into the outer hallway. Each receiver was thanked for their participation in the study and given a debriefing statement. Any receivers that scored above chance (more than 8 hits) were paid two dollars per hit above chance.

Meanwhile, a research assistant in the waiting room would randomly select the next participant, escort them to the sender room for their introduction, and then take them back to the receiver room to being their run of 16 trials. During this transition, another research assistant would enter the receiver room and refresh the web page, navigating back to the front 'join' page. In the sender room, research assistants took care to refresh their page as well; clicking join in advance of the next receiver. As the first person to join

is designated the sender, this ensured that the sender room was actually ready to send by the time the next receiver was taken to the room and clicked the join button.

During these trials, research assistants in both the monitor room and the sender room recorded the results on record sheets. The website, at this stage of its development, was only somewhat capable of recording and storing all the data collected, and it was decided that continuing to keep records by hand would be best. The website was also not capable of playing a bell or buzzer sound itself, so this task was done manually from the monitor room. After a 'hit' was scored, a research assistant would sound the bell. After a 'miss' was scored, the buzzer would be sounded.

After running eight to ten receivers, based on time constraints, the remaining participants in the waiting room were thanked for their participation, and told that unfortunately, time was up, and they would not get a turn, but would still receive full credit. They were given a debriefing statement and told they could leave.

The senders stayed until all receivers had finished. At the conclusion of each data collection session, results were calculated for the total number of hits obtained for the night. Each hit above chance was worth two dollars. This amount was calculated and then divided between senders, in the event that scores were above chance for the night. Senders were then thanked for their participation and given a debriefing form and told they could leave.

## Results

### *Analysis*

It was hypothesized that a game-show like format, and the use of a monetary incentive, creating a sense of competition or challenge, could increase either psi-hitting or

psi-missing. Additionally, it was hypothesized that dividing groups of senders and receivers based on gender could produce a similar effect: specifically, we assumed that female receivers, being introduced to all-male sender groups would be more likely to feel uneasy and score lower than other groups.

A total of six data collection session were run with small groups ranging in size from 8 to 12, for a total of 53 receivers (9 men and 44 women). The mean belief score for all receivers (N = 53) was 3.96. The mean belief score for women (N = 44) was 4.07. The mean belief score for men (N = 9) was 3.29.

All participants (N = 53) combined had an overall hit rate mean of 7.87, *SD* = 2.38, across six sessions. The results of a one sample t-test comparing overall hit rate for the sample with expected probability, $t(53) = -.404$, $p = .68$ (two-tailed) were not significant. The distributional shape of hits was examined to determine the extent to which the assumption of normality was met. Skewness (-.078, *SE* = .327), kurtosis (-.843, *SE* = .644), and the Shapiro-Wilk test of normality (*S-W* = .948, *df* = 53, $p = .022$) suggest that the data may not be normally distributed.

Of specific interest is the frequency at which extreme scores occurred. Examining the distribution of scores shows a distribution skewed away from the center and towards high and low scores. To calculate the probability of aspects of this distribution we compare this with the binomial distribution. With two alternatives with known probabilities the binomial distribution can be used to determine exact and cumulative probabilities for our data set. We observe our most extreme scores, four hits out of 16 trials, have a probability of occurring equal to .028: we would expect 2.8 in 100. Likewise, with our extreme high scores of 12, would also expect 2.8 in 100. We might

conclude then, given our sample of 54, according to the binomial distribution, that our observed frequency of seven scores of four in runs of 16 would occur at $p = .0001$. But this may overstate the case and we must look at the data in the most conservative way. We are not interested in the chances of exactly four hits in 16 trials, but rather in scores this extreme or more, thereby including the cumulative area under the tail of the curve: the probability of zero hits, one hit, two hits, three hits, and four hits out of 16 trials. This gives us the probability of scoring four hits or less out of 16 as $p = .038$, and the chance of scoring four hits or less, seven times given our sample of 54 at $p = .003$. But again, to provide the most conservative estimate of probability we should note that, as we are not solely interested in the exact probability of four hits out of 16, we are also not solely interested in getting exactly seven scores of four or less, and must calculate the probability of getting seven or more scores this extreme: giving us $p < .004$ (Gruber, personal communication, 2017). Examining, in this conservative manner, all 11 of the extreme scores observed (4s and 12s) out of our 53 participants gives us $p < .002$. However, as one of our primary assumptions was that female receivers (after being introduced to all-male sender groups) would score low, the tendency for extreme scores to happen most often in the direction we expected is of note.

*Effects of Belief*

Participants were asked to rate their belief in the existence of telepathy on a seven-point Likert scale, with a one representing very low belief, and a seven representing very high belief. Those who reported one to three on this scale were considered to have low belief (N = 23), while those who reported five to seven on this scale were considered to have high belief (N = 25). Three participants who reported four,

and two participants who failed to report a score were omitted. Results of an independent samples t-test show that high belief participants ($M$ = 8.24, $SD$ = 2.185) scored slightly higher than low belief participants ($M$ = 7.78, $SD$ = 2.558), $t(46) = .668$, $p = .508$ (two-tailed), $d = 0.19$.

*Effects of Gender*

After running one data collection session with men acting as receivers, it was decided that this condition would be discontinued due to subject pool limitations. In light of this, an examination of the data with session two (the only session utilizing male receivers) removed is appropriate. Results of an independent samples t-test show that high belief women (N=23, $M$ = 8.30, $SD$ = 2.141) scored slightly higher than low belief women (N = 18, $M$ = 7.67, $SD$ = 2.722), $t(39) = .84$, $p = .406$ (two-tailed). While not reaching significance, a small effect size ($d = 0.25$) was found.

Examining just female participants (N = 44) reveals that the odds of seven scores of four out of 44 participants is extremely unlikely at a thousand to one against chance. Eleven extreme scores (4's and 12's) out of 44 participants were found. The odds that this occurred strictly due to chance are $p = .0003$. It should also be noted that this tendency for participants to score extremes, diverging from chance expectation, was also observed in male receivers, albeit to a lesser degree. None of the male receivers in the study scored a four, though three scores of five were observed. The odds that three of our nine male participants scored this low are .059. Three other male receivers scored '10' hits. The odds against chance of 6 of our 9 participants scoring this far from the mean chance expectation are .04.

*Effects of Gender-pairing*

Receivers of the study can also be sorted into two conditions based on the gender of groups-same sex pairings or opposite sex pairings. Results of an independent samples t-test show no difference between same-sex groupings (N = 19, $M = 7.89$, $SD = 2.536$) and opposite-sex groupings (N=34, $M = 7.85$, $SD = 2.324$), $t(51) = .061$, $p = .952$ (two-tailed). Removing data collection session 2, results of an independent samples t-test again show no difference between same-sex groupings (N = 19, $M = 7.89$, $SD = 2.536$) and opposite-sex groupings (N = 25, $M = 7.96$, $SD = 2.406$), $t(42) = .087$, $p = .931$ (two-tailed).

## Discussion

One of the first major considerations that must be addressed regarding this semesters data is that of methodology. While the EIU parapsychology lab has been operating for over a decade, and numerous studies have investigated psi functioning, this study can, in many regards, be considered something of a pilot study. At the outset of the study, the main focus was on the development of the website described previously. It represented a rather large leap forward. Our main feeling at the time was one of eagerness: we wanted to try it out. Methodological changes each semester are generally discussed in depth with the group of research assistants. In some respects, this was of less concern, as the main point of discussion was the new website, and an explanation of its functioning to a mostly new group of research assistants.

When the specifics of the study were discussed, it was decided that one of our primary focuses would be on the variable of individual comfort level. It has long been observed that participants in our studies appear somewhat uncomfortable with the idea of

being on camera. A number of participants each semester invariably ask if their faces will be visible on camera, and each semester, we end up having to explain that their backs will actually be facing the camera once they are seated and undertaking the psi task, generally to their relief. We assumed that introducing participants individually to the group of senders, and showing them the sender room with the video feed displayed by projector on a wall, could potentially increase this unease in certain groups of participants (namely, female receivers being introduced to all-male sender groups). Our hypotheses concerning other gender-pairings of groups were never truly laid out, though the idea that males, being introduced to all-female sender groups may not feel remotely uneasy, did not escape our attention.

Furthermore, we assumed that dividing participants by gender would likely have a similar effect; a departure from the everyday co-ed classroom. It was assumed that females, in particular, being introduced to an all-male room of senders would be the most uncomfortable group. We did however, intend to examine each possible gender-pairing: men sending to men, men sending to women, women sending to women, and women sending to men.

After our second data collection session however, this proved impossible due to subject pool limitations. Few men were signing up for the study. As fewer men were needed on the sessions we used men as senders, it was decided that we would only use female receivers for the rest of the data collection sessions. Data collection sessions four and six use female senders and female receivers, as the male subject pool was limited.

We are thus left with three sessions (1, 3, 5) testing male senders sending to female receivers; one session (2) with female senders sending to male receivers; and two

sessions (4, 6) with female senders sending to female receivers.

It is also interesting to note that, for the first time in the history of the EIU parapsychology lab, we have ruled out a psychokinesis effect. Previous studies have used the methodology described by Parker (2006):

> Two pages of random numbers were generated from the website "random.org" and were printed by the lead researcher prior to the start of each session. These pages included numbers 1,2, 3, and 4 divided into twelve columns. "Random.org" generates random numbers by using a process known as white noise, which is said to be more random than the pseudo-random numbers generated by computer programs. A coin was flipped to determine which sheet to use. A second coin flip provided the starting location which would be either at the top or bottom of a column. A third coin flip determined whether the research assistants would use either the right or left side. The researchers rolled two dice to determine the column (2-12) that would be used. Target locations were randomly selected by entering the table at the location received via the process described (Upper left were 1's, upper right were 2's, lower left were 3's, and lower right were 4's). The research assistant placed the red disc on the foam board according to the designated location. The receiver then received a signal (the doorbell) which prompted them that the target had been selected and the senders had begun focusing on the target (p. 30).

As discussed previously, telepathy is only one explanation of the deviations from chance expectation that we observe. Precognition, clairvoyance, and psychokinesis have never been ruled out. In prior studies, an argument could be made for a PK effect. Participants

could have theoretically been influencing the dice rolls and coin flips that determine the random numbers selected (or more unlikely, influencing the atmospheric white noise that determines how "random.org" selects random numbers in advance of the study). With the change in methodology, utilizing a pseudo-random number generator in a computer program that isn't susceptible to PK, and with research assistants having no influence whatsoever on the randomization process, we can now be relatively sure that PK isn't the effect we're studying.

Perhaps of some interest is the idea that we could conceivably continue narrowing the focus of our study. While the current focus of the lab is more aimed at process oriented psi research, and a discussion of the actual psi effect we're studying is of less interest, the advent of the website offers the opportunity to rule out possibilities. If, for example, in a future study, the website was modified in small ways, we could potentially rule out precognition if we no longer offered feedback, and participants were not told how they scored. Pure precognition- obtaining information from the future- would presumably require that that information was available at some point in the future. Alternatively, using the website as is, it would be possible to rule out telepathy as an explanation. Instead of using a group of senders, a single research assistant could be put in charge of the sender computer. Immediately after clicking the 'join' button, and before receivers were taken to the receiver room, the research assistant could leave and secure the room. With no human knowledge of the position of targets, telepathic communication is ruled out. Ruling out clairvoyance would require more modification of the website, but would also be possible if the site were modified so that the target placement didn't occur until after receivers had made their guesses.

These considerations are somewhat academic however, as the lab is currently focused on isolating variables that influence psi performance. The findings of the current study reinforce that goal. Hypothesizing that uncomfortable participants would score below chance expectation and then finding that a far greater number of participants than expected miss well below chance levels offers a promising direction for future research. As noted, the odds of seven of our fifty-three participants scoring a four or less is .004. It should also be emphasized that, in an effort to examine this data as conservatively as possible, all binomial calculations were done using cumulative probabilities. Thus, this is the odds of seven or more participants obtaining four hits or less. Assuming no psi effect, we would therefore expect to need to repeat the entire experiment 250 times before finding a similarly skewed data set.

While one of our experimental manipulations (introducing receivers individually to sender groups) had the potential to produce low scores, a number of aspects of the experiment were intentionally at odds with that goal. First is the belief variable.

Our participants' belief in psi has always been examined, and is generally considered to be one of the stronger variables that influence psi performance, both in our lab, and in the general parapsychology literature. One of the basic aspects of our methodology, that we have not deviated from since the beginning of the lab, is explaining to participants that we believe in the psi effects we're studying. The script for this particular semester, read by research assistants to each group of participant's states "a lot of people don't know this, but there is a great deal of very good scientific evidence, from all over the world, that mental telepathy is real! And we have very strong evidence from this experiment." This is one of the few sections of the scripts done entirely in bold text,

and its importance was stressed to the research assistants before data collection.

That we reinforce a belief in psi is one of the aspects rarely discussed among the research team. Many years ago, it was decided that deceit was a variable we'd prefer not to introduce. The scripts for the experiment have evolved over time, but one of the aspects that has remained somewhat unchanged is our generally positive attitude about psi effects, and our willingness to discuss these effects with participants. As noted previously, reinforcing participants' belief in psi is a factor that may produce above chance hitting (Smith, M. D., Foster, C. L., & Stovin, G.,1998; Storm & Thalbourne, 2005; Walsh and Moddel, 2007).

Additionally, consideration must be given to the variables of gender and gender-pairing. One of our experimental manipulations involved influencing individual participants comfort levels, and because of subject pool limitations, we primarily ran women as receivers. Our hypothesis was that women would be most uncomfortable upon being introduced to an all-male sender group. We therefore expected the men sending to women condition to be the most likely one to yield below chance scores. This however, is directly at odds with the findings from the PEAR lab (Dunne, 1993) that suggest that opposite-sex pairs may work better together than same-sex pairs. This could potentially explain why no difference between groups was observed. If we assume that our manipulation was successful, and that women were indeed more uncomfortable when introduced to all-male sender groups, this is canceled out by the fact that women and men work well together at a psi tasks. Alternatively, assuming that women were more comfortable upon being introduced to female sender groups, which would theoretically lead to higher scores, this is canceled out by that fact that same-sex pairings yield

nonsignificant results. As our main interest in this data set is that of the extreme scores we observed (scores of 4 or 12), it is interesting to note that these scores were split nearly evenly across these two conditions. Opposite-sex pairs produced four scores of four, and two scores of 12, while same-sex pairs produced three scores of four, and two scores of 12.

Also worthy of consideration is the idea that women may possess a greater aptitude for psi tasks in general. This can obviously not be claimed with any great certainty, but certain studies are suggestive (Dunne, 1998; Bierman & Scholte, 2002; McCraty et al, 2004b). Entirely within the realm of possible explanations for our results is the idea that our experiment is more a test of precognition than of telepathy (or alternatively, a combination of telepathy, precognition, and even clairvoyance). The findings presented by Dunne (1998) that women, by their mere presence, can skew an RNG's baseline function without intending to, are merely suggestive of a such an aptitude. The findings presented by Bierman and Scholte (2002) and McCraty et al. (2004) however, suggest that women may indeed possess more intuition than men. If this is the case, once again we have aspects of the experiment at odds with itself. We are testing, primarily, women, in an atmosphere where we assume they may score below chance, while understanding that women, possessing more intuition than men, could potentially score above chance at a task that could very likely relate directly to intuition.

After examining methodological factors relating to the belief and gender variables, it is worth looking at the experimenter effect variable. In prior studies, a great deal of attention has been given to differences between 'class' and 'not class' participants. 'Class' participants being student who were enrolled in the lead researchers introductory

course, and 'not class' participants being students enrolled in a different professor's course. This is a variable of less interest for this data set as Dr. Gruber was not teaching an introductory course during this semester. Additionally, the creation of the website is a first step in creating a methodology that can be replicated elsewhere by other experimenters. To that end, Dr. Gruber was not directly involved in data collection sessions, and had little interaction with participants. Scripts were instead read by research assistants. Our interest in an experimenter effect then, is that of the experimental setting. The current hypothesis regarding the game-show like format, and the use of a monetary incentive is as follows:

> Both participants in the sender groups and individual receivers will receive money for each hit achieved above random chance. It is hypothesized that the game format and monetary incentive, by creating a sense of competition or challenge, has the potential to increase both psi hitting and psi missing. (Gruber, personal communication, April 20, 2017)

A directional hypothesis, as to whether the game format and monetary incentive increases or decreases hit rates has never really been established. Our overall estimation is that it results in increased focus in the psi task. This increased focus is thought to co-vary with other factors, and in any given semester, our thoughts on which direction results may go is up for debate. McWhorter (2005), describing a methodology used before we introduced a monetary incentive, writes:

> In the current study, the experimenters attempted to create an open, warm, and friendly interaction with the participants and maintain an enthusiastic tone. This seemed to be effective throughout the first set of 16 trials. However, following

> the break, beginning with the second set, the researchers noted that the participants appeared to lose focus and become talkative. The lack of feedback regarding their hit rates, as well as fatigue or boredom, may have led to a decrease in motivation, which may explain the differences noted between Set A and Set B. (p. 32-33)

The use of a monetary incentive for above chance hit rates was introduced in an effort to increase focus and motivation. As a monetary incentive has been noted a number of times since then to produce significant findings, we have continued its use.

As for the current study, research assistants weren't specifically instructed to try and maintain a warm, enthusiastic tone, or to influence the overall warmth of groups. Nor were they instructed to approach the experiment with a degree of boredom or unfriendliness (as has been attempted in previous studies). The general atmosphere of each room then, was left mostly up to the participants. As all participants were taken from introductory psychology courses, many participants were on friendly terms, and on certain data collection sessions it was obvious that the atmosphere in the sender or receiver rooms was rather friendly.

Once again, we have an aspect of the experiment directly at odds with the hypothesis concerning below chance scoring. Friendly atmospheres, a game-show like setting that can be considered rather fun, and offering the chance of winning money for doing well, are factors that one could argue would lead to increased, above chance hit rates.

A discussion occurred midway through the semester, where it was decided that a measure that would accurately reflect individual unease would be a rating of

introversion/extraversion, a variable measured in the parapsychology literature that has been shown to have a significant effect. Introverts, presumably, would be shyer and more uncomfortable with the introduction to the sender group and being observed on camera, and would likely score lower than extraverts. Unfortunately, implementation of this rating scale midway through data collection however wasn't feasible, though it is being planned for in future studies.

What we are left with is a study designed to produce both below chance scoring and above chance scoring based on aspects of three variables of specific interest. Hypothetically, an experiment designed in such a way would very likely lead to results that look truly random, and hint at no psi effect. Conner (2009) discusses a similar issue:

> It is interesting to note that the data obtained for Part I appears to show no effect when collapsed across sessions, but when the variable of friendliness is introduced, important information comes to light and strong findings appear. For instance, across nights (N = 9) direct hits were 25.4% and overall hits were 49.0%. However, with a friendliness rating of 5.7 (on a 7 point scale), participants in Session 3 had a 26.9% direct hit rate and a 55.0% overall hit rate while Session 1 participants with a friendliness rating of 1.0, had a direct hit rate of 19.4% and an overall hit rate of 44.4%... If relevant variables such as gender, belief, etc. are not taken into consideration, data sets with strong effects may appear to be random. Specifically, without considering friendliness as a variable in Part I, there appears to be no effect. In other words, when the above chance hit rates of friendly groups (psi-hitting) are combined with the below chance hit rates of less friendly groups (psi-missing), the results cancel each other out and results

appear to be random. (p. 59)

The results of the current study are in many ways atypical of the findings we've come to expect. In any given semester, it's become fairly common to examine a data set that appears random, split it by one of the variables we're interested in, and immediately notice differences between groups. This generally results in highly significant t-tests or correlations. The current studies data offers a bit of a departure from that. Across variables, few group differences are found. The strongest finding among groups is found when comparing high belief women to low belief women, and while results of a t-test fail to reach significance, the direction of scoring is in the expected direction and shows a small effect size (Cohen's $d = .25$). That no other major group differences were found is intriguing. The possibility exists that, due to the ideas discussed above pertaining to a methodology that is very much at odds with itself, the effects we're more accustomed to finding were more or less canceled out. However, we are still left with an extremely interesting data set that contains a very unlikely ratio of extremely low and high scoring participants.

Assuming for a moment, that, due to the nature of the methodological contradictions, effects were canceled out among the majority of our participants, we're left wondering why these extreme scores happened at such a frequency. If, as noted previously, we were in fact measuring the wrong variable of group friendliness and enthusiasm, and should have instead measured introversion/ extraversion, we can hypothesize that, had this measure been in place, it may have better explained the anomalies found in the data.

Our most interesting finding, perhaps, and certainly the most unlikely one, is

when examining all female receivers, and simply analyzing the frequency of extreme deviations from our mean chance expectation of 8 hits. Eleven of our 44 participants scored either '4' or '12' hits, or, restated, 25% of our participants obtained extreme scores when we would only expect 7.6% of our participants to do so by chance. The odds of this happening strictly due to chance are .0003.

A brief effort to explain this in somewhat more relatable terms: our experiment offers participants an equal chance of scoring either a hit or a miss. Pure 50/50 odds: the same as flipping a coin. Thus, our experiment can be replicated using a coin. 16 coin flips would represent one participant's scores. 44 participants would represent the 44 women we tested over five data collection sessions. 704 coin flips then, replicates our experiment. Assuming one could flip a coin and record the result of the coin flip every 5 seconds, replicating the experiment takes just under one hour (58.6 minutes). If one then wanted to argue our results as being strictly due to chance, one could then set out to find a data set that contained 11 or more scores of four or less or 12 or more. This theoretical, and truly inspired, skeptic, would then only need to flip a coin every five seconds (24 hours a day, seven days a week) for the next four and a half months to obtain such a data set.

This extreme variance observed in our results offers exciting avenues for future research. Identifying that aspects of the methodology are at odds with itself, it should be possible in the future to modify the study further in order to obtain data sets more strongly indicative of the effects we desire. If we wanted, for example, to attempt another, similar, study and produce below chance scoring, certain steps could be taken.

As belief is a strong factor in psi performance, participants could be pre-selected

based on their belief scores, and only low belief participants could be run. Additionally, we could eliminate the portion of the script that reinforces a belief in psi. Alternatively, as has been done in other studies, we could explain to participants that we don't believe in a psi effect, and we are conducting the study to disprove it (this, however, introduces an element of deceit, which we have thus far avoided).

Additional measures could be taken to influence the mood and atmosphere of the study. Removing the monetary incentive could potentially lower hit rates. As could instructing research assistants to maintain a bored monotone demeanor throughout sessions. Any number of other manipulations could potentially be put in place. Often discussed in the lab is the idea of introducing fake equipment malfunctions that result in a slowed pace of the experiment and introduce boredom.

Furthermore, a true investigation of the gender variable would be relevant. Our initial intention was to pair men with women, men with men, women with women, and women with men. Further studying how gender-pairing works in our experiment could yield interesting results. Additionally, we used the gender-pairing variable to potentially increase unease. Finding a new methodology not dependent on gender, that inspired similar levels of unease would help isolate the variables involved.

An alternative to this proposed methodology would, perhaps, be simpler. Instead of trying to decrease hit rates, we could move away from the idea of increasing participants' uneasiness. Doing away with the camera and video feed would potentially yield higher hit rates. As many of the aspects of the experiment already in place are aimed at increasing hit rates, we would expect above chance scoring. Additionally, ever present in our decision-making process regarding methodology is the idea that psi, by its

very nature, may be elusive. General replicability in the field is low, and we often find ourselves concerned that a true replication study cannot be done, due to experimenter effects.

Despite the methodological contradictions presented above, our results are indicative of our ability to manipulate variables in a way shifts results in the direction we desire. With any number of methodological changes, we may be able to further isolate the variables involved. Additionally, the creation of the website, and our eventual goal of disseminating it, and our findings to the parapsychology field could lead to replication studies in other labs. This represents a truly exciting step forward that could yield any number of interesting findings about psi.

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Figure 1.

*Frequency Distribution for Hits out of 16 trials*

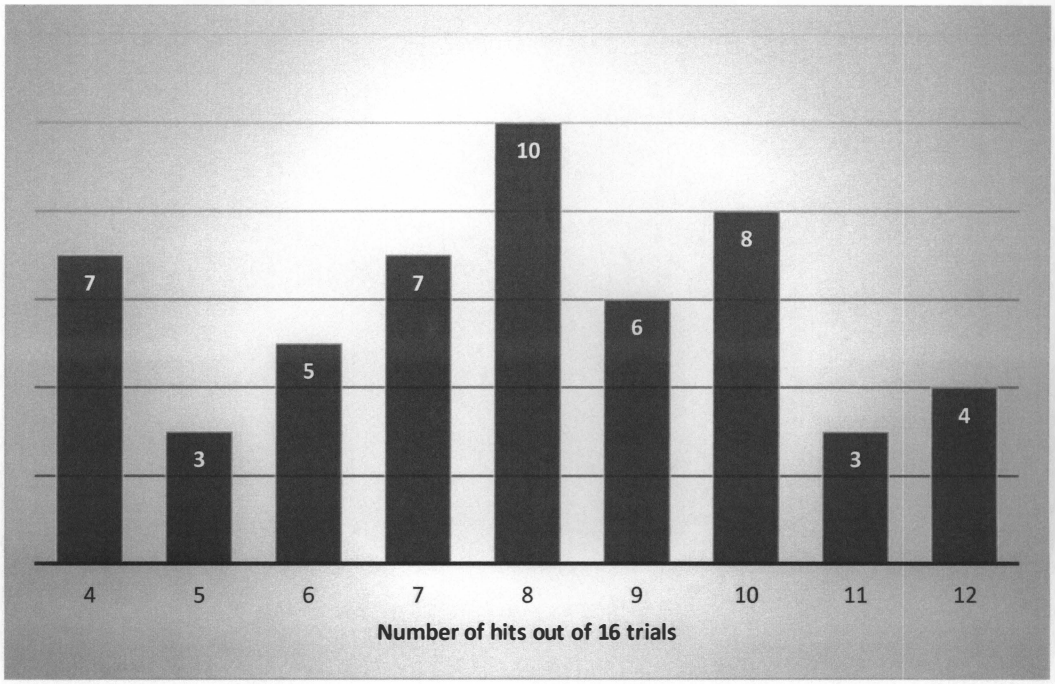


Figure 2.

*Expected Normal Distribution for 53 participants*

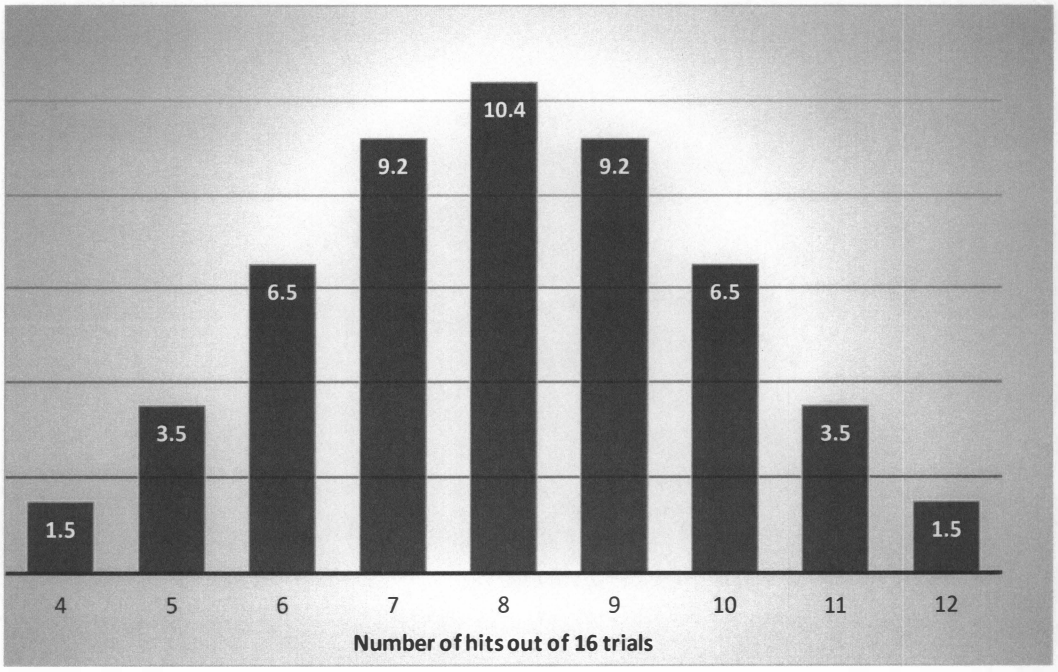

Table 1.

*Breakdown of Observed Scores*

| Hits out of 16 trials | Exact Probability | Expected Frequency | Observed Frequency | $p(x \geq \text{observed})$ |
|---|---|---|---|---|
| 4 | .028 | 1.5 | 7 | < .001 |
| 5 | .067 | 3.5 | 3 | .698 |
| 6 | .122 | 6.5 | 5 | .791 |
| 7 | .175 | 9.2 | 7 | .967 |
| 8 | .196 | 10.4 | 10 | .608 |
| 9 | .175 | 9.2 | 6 | .921 |
| 10 | .122 | 6.5 | 8 | .317 |
| 11 | .067 | 3.5 | 3 | .698 |
| 12 | .028 | 1.5 | 4 | .061 |

Appendix A: 16 Trial Data Record Sheet

Name (please print)_____Date_____

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| OO | OO | OO | OO |
| OO | OO | OO | OO |

| 5 | 6 | 7 | 8 |
|---|---|---|---|
| OO | OO | OO | OO |
| OO | OO | OO | OO |

| 9 | 10 | 11 | 12 |
|---|---|---|---|
| OO | OO | OO | OO |
| OO | OO | OO | OO |

| 13 | 14 | 15 | 16 |
|---|---|---|---|
| OO | OO | OO | OO |
| OO | OO | OO | OO |

Appendix A: Belief and Demographic Question

## Mental Telepathy Belief Question

I believe that mental telepathy is _____

(circle one)

1 2 3 4 5 6 7

Very **unlikely** to exist

Very **likely** to exist

Demographic questions

Age_____

Sex _____

Which of the following options best describes your ethnic background?

(a) Caucasian (b) African American (c) Hispanic (d) Asian (e) Native American (f) Other

## Appendix A: Consent Form

### Consent Form for Mental Telepathy Experiment

This experiment involves the study of mental telepathy – the ability to send information from one mind to another without sensory input. There will be two groups participating in this experiment. One group will play the role of "senders" while the other will play the role of "receiver." The groups will be located in different rooms and will get specific instructions involving the tasks they will be performing.

The receiver will be asked to sit in a room in front of a computer monitor displaying a board marked with four circles. Through video feed this image will be transmitted to a room where the senders of the experiment will be able to see and hear the receiver.

The computer will randomly select a hit target and a miss target. The group of senders will attempt to telepathically send the location of the hit target to a receiver. The receiver will attempt to find the hit target while avoiding the miss. Each receiver will participate in a run of 16 trials. If you do well on this task you will have a chance to win money – as explained in the instruction sheet.

This experiment will take about 1 and 1/2 hours. You will receive two hours of credit for your class research requirement.

We do not foresee any risk or discomfort from the above procedure, and would like to remind you that your participation is completely voluntary, that all personal information collected will be kept strictly confidential, and that you may withdraw your participation at any time without penalty. Expected benefits from participation may include an increased understanding of research in Psychology as well as learning about and furthering progress in an interesting field of Psychology.

If you have any questions or concerns about the treatment of human participants in this study, you may call or write: Institutional Review Board, Eastern Illinois University, 600 Lincoln Ave., Charleston, IL 61920, Telephone: (217) 581-8576, E-mail: eiuirb@www.eiu.edu. You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with EIU. The IRB has reviewed and approved this study.

Print Name _____ Date _____

Signature _____

Appendix A: Debriefing Statement

## Mental telepathy experiment debriefing statement

Thank you for participating in the mental telepathy experiment. We have been testing different approaches to sending and receiving telepathic information using groups. The study you have just completed is designed to explore the effects of gender and belief on mental telepathy hit rates. While there is considerable evidence for the existence of mental telepathy, it remains a controversial and mysterious phenomenon. Your participation in this research study may help us to gain a better understanding of the variables that effect telepathic hitting and missing in a laboratory setting. Thank you very much for your participation!

If you have any questions or would like further information about this, study please feel free to contact me.

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Appendix A: Brief Instructions – Receivers

**Brief instructions – Receivers**

–There are two groups participating in this study – **senders** and **receivers**

– You will be playing the role of **receiver** while a group of people, in another room, will be playing the role of **senders**.

–Please wait in this room until you are randomly selected to act as the **receiver**. When selected you will be introduced to the **senders** and escorted to the **receiver room**. You will be seated in front of a computer monitor and a video camera will send your image to the **sender room**.

– Each individual receiver will do one "**run**" – made up of 16 " **trials**." To begin each trial the computer will display a board with four blank circles, one in each corner.

–The same board will appear in the **sender room** – but, on the sender's board, two circles will be randomly selected as **targets**. One circle will have a **green** sign that says **hit** and one will have a **red** sign that says **miss**. Two circles will be **blank**.

– After a few seconds a **bell** will signal the start of the trial. The **senders** will be focusing on the **hit** sign – *they will be trying to telepathically send you the location of the **hit***.

– Your task as the **receiver** is to find the **hit** by clicking on one circle at a time. If you find the **hit** a **bell** will sound. If you click on the **miss** a **buzzer** will sound. If a **blank circle** is chosen there will be no sound – the circle will turn **gray** and you will try again — take your time – and focus your attention on finding the **hit** and avoiding the **miss**.

– Remember, the **senders** are trying to help you find the **hit** and avoid the **miss.**

– On any trial, you have a 50-50 chance of scoring a **hit** – so, out of 16 trials a score of 8 is equal to chance. You will be paid **$2 cash** for every hit you score above chance.

–After a run of 16 trials a new **receiver** will be chosen and brought to the **receiver room.**

– We will try to have everyone participate but we may run out of time. Everyone will receive full credit for the experiment

Appendix A: Brief Instructions - Senders

## Brief instructions - senders

–There are two groups participating in this study – **senders** and **receivers**.

–Your group will be playing the role of **sender** while others, not in your group, will be **receivers**. You will be able to see and hear the receivers – they will not hear or see you.

–You will send to six or eight individual receivers – each receiver will participate in a "**run**" of 16 " **trials.**" At the end of each run a new receiver will be selected.

– To begin each trial, you (the sender's) will see a board with four circles, one in each corner – two circles will be randomly selected as targets. One circle will have a **green** sign that says **hit** and one will have a **red** sign that says **miss**

–After a few seconds, the receiver will see **the same board** with four circles, but they will **not** have **hit** and **miss** signs – they will be **blank**.

– After a few more seconds a bell sound will indicate the start of the trial.

– Your task as **senders** is to focus on helping the **receiver** to find the **hit** target while avoiding the **miss.**

– The task of the receiver is to find the **hit** by clicking on one circle at a time.

–If the **hit** is found a bell will sound.

–If a **miss** comes up a buzzer will sound.

– If a **blank circle** is chosen there will be **no sound** – the circle will turn **gray** – and the receiver will try again— **receivers** will be instructed to take their time between each click – and to focus their attention on finding the **hit**.

– the **receivers** will be told that you, the **senders** are trying to help them find the **hit** and avoid the **miss** target.

– you can win money – on any trial, the receiver has a 50-50 chance of scoring a **hit** (out of 16 trials a score of 8 is equal to chance). After all receivers are run, total hits will be subtracted from total misses. You will be paid **$2 cash** for every hit scored above chance. This money will be divided between all members of the sender group.

## Appendix A: Script - Receivers

Script – receivers

– Greet arriving participants – Hi, Are you here for the psychology experiment? Come in – take a seat – we will be getting started in a few minutes

– let's get started

– you are here for a psychology experiment (do you know the name of the experiment?)

– we are studying mental telepathy!

– this is a very controversial topic

– " **a lot of people don't know this, but there is a great deal of very good scientific evidence, from all over the world, that mental telepathy is real! And we have very strong evidence from this experiment "**

– We are actually going to be doing mental telepathy!!

– The first thing we are going to do is read and sign the consent form – please read this carefully – it explains a little bit about the experiment – after this we will give you more detailed instructions – (**handout consent forms)**

– now, please turn the consent forms over and answer the questions on the back (demographics questions and belief question)

– " this question asks, on a seven–point scale, do you think mental telepathy is very likely to exist or very unlikely – "think about this and **try to make a decision one way or the other"**

– (collect forms)

– Here are more detailed instruction, please review these carefully, as I read them out loud

– handout and read **Brief Instructions – Receivers**

– Here's a demonstration of how this will work

– The board I have here looks like the board you will see on the computer screen (show board)

– You will see a blank board, while the senders, in another room, will see the same board but they will also see randomly selected targets saying hit or miss, like these (show discs)

Appendix A: Script – Receivers Cont.

– you will be seated in front of a computer monitor and after a few seconds the blank board will appear – wait for a bell to indicate the start of the first trial

– after the bell your job is to try to find the hit and avoid the miss target

– after the trial ends wait for the next board to appear and wait for the bell to begin

– After 16 trials we will come get you – and we will pay you if you hit above chance

– Next, we are going to give you some brief mental telepathy tips – this is how to do it!

– You are the receivers, but we are also including tips for the senders, so you will also understand their task

– **"Any questions?"** (– answer any question)

– Now we are going to shuffle your consent forms and randomly choose the first receiver

– (Choose receiver, RA and receiver to meet senders, then to receiver room and logon) **"stay focused – do your best"**

– two RAs to monitor room – one RA in waiting room???

## Appendix A: Script - Senders

Script – senders

– Greet arriving participants – Hi, Are you here for the psychology experiment? Come in – take a seat – we will be getting started in a few minutes

– let's get started

– you are here for a psychology experiment (do you know the name of the experiment?)

– we are studying mental telepathy!

– this is a very controversial topic

– " **a lot of people don't know this, but there is a great deal of very good scientific evidence, from all over the world, that mental telepathy is real! And we have very strong evidence from this experiment** "

– "We are actually going to be doing mental telepathy!!"

– The first thing we are going to do is read and sign the consent form – please read this carefully – it explains a little bit about the experiment – after this we will give you more detailed instructions – (**handout consent forms)**

– now, please turn the consent forms over and answer the questions on the back (demographics questions and belief question)

– " this question asks, on a seven–point scale, do you think mental telepathy is very likely to exist or very unlikely – " think about this and **try to make a decision one way or the other"**

– (collect forms)

– Here are more detailed instruction, please review these carefully as I read them out loud

– hand out and read **Brief Instructions – Senders**

– Here's a demonstration of how this will work

– The board I have here looks like the board you will see projected on this wall (show board)

– the board will appear with randomly selected targets saying – hit or miss (show discs)– a receiver, in this room (point to projection on wall) will see the same board on a computer monitor, but It will be blank

Appendix A: Script – Senders Cont.

– After a few seconds a bell will sound indicating the start of the first trial

– the receivers job is to try to find the hit and avoid the miss

– **Your** job is to focus on the target and try to help the receiver find the hit

– after the trial ends the next board will appear with the randomly placed targets

– After 16 trials a new receiver will be chosen and the next run will begin

– After eight receivers are run, we will calculate the number of hits – your group will be paid two dollars for every hit scored above chance – the money will be divided equally

– Next, we are going to give you some brief mental telepathy tips – this is how to do it! (handout tips)

– You are the sender's, but we are also including tips for the receivers, so you will also understand their task

– **"Any questions?"** (– answer any question)

– As soon as the first receiver is chosen, we will be introduced to the receiver, then, they will be seated at the computer monitor and we will get started!

Appendix A: Mental Telepathy Tips Sheet

**Tips for mental telepathy – (how to do it)**

Sender tips:

Try to clear your mind and wait for the circles with targets (**hit**) or (**miss**) to appear

Focus your attention on the **hit** target

Keep the receiver in mind – try your best to help the receiver locate the **hit** target

In a few seconds, the receiver will start making choices

You will see the receiver's choices as they are made – try to stay focused!

Receiver tips:

Try to clear your mind and wait for the blank circles to appear

When the circles appear, begin making choices by clicking the mouse

Keep the task in mind – find the **hit** and avoid the **miss!**

If you find the **hit** you will hear a bell – and a new trial will start

If the **miss** comes up, you will hear a buzzer – and a new trial will start

If you click on a **blank circle** – no sound – it will turn **gray** – choose again

Take your time – don't rush – stay focused – find the **hit** and avoid the **miss**!

# Appendix B: Website Images

*Sender screen*


Target location as displayed to the sender group. In this image, the receiver has not yet selected a location.

Appendix B: Website Images

*Sender Screen*


Target location as displayed to the sender group. In this image, the receiver has selected one blank space (filled in gray), followed by the hit location (filled in green).

## Appendix B: Website Images

*Receiver Screen*


Four-choice format as displayed to the receiver. In this image, the receiver has selected two blank spaces (filled in gray), followed by the miss location.