AUTONOMIC DETECTION OF REMOTE OBSERVATION: Two Conceptual Replications[1]

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ABSTRACT: Two experiments were conducted to measure the extent to which people are able to unconsciously detect another person staring at them from a distance. A closed-circuit television set-up was employed in which a video camera was focused on the experimental volunteer (Observee) while a person in another room (Observer) concentrated on the image of the distant person as displayed on a color monitor; this procedure was used to preclude any conventional sensory contact between the two people. During the experimental session, the Observee's galvanic skin responses were monitored. An automated and computerized system was programmed to record and average the physiological responses of the Observee during 32 30-second monitoring periods. A random sequence was used to schedule 16 periods of remote observation and 16 control periods when no observation efforts were attempted. A within-subjects evaluation was made for each experimental session with a comparison between the mean amount of autonomic nervous system activity during the experimental and control conditions. Twenty four sessions were conducted in each of two experiments. As predicted, both experiments yielded significantly more autonomic activity during the remote observation periods as compared to control periods (Experiment 1: $t=1.878$, $p<.036$, 1-t, es=.36; Experiment 2: $t=2.360$, $p<.014$, 1-t, es=.44). As preplanned, the two experiments were combined to increase statistical power, yielding a significant t-value of 2.652 ($p<.005$, 1-t, es=.36).

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INTRODUCTION

The past few decades have witnessed an increasing interest in the possibility of direct mental influences on living systems. A diverse range of experiments have been conducted by researchers within the United States, Canada, and Europe (for reviews, see Benor, 1990; Dossey, 1993; May and Vilenskaya, 1994; Solfvin, 1984). In a typical experiment, some physiological activity or other selected behavior is monitored in the context of a formal laboratory experiment. Efforts are made by experimental participants to influence a distant biological target system with a comparison between experimental conditions and non-influence or control conditions. Target systems for these experiments have included micro-organisms, plants, animals, and human physiology or motor activity (Schlitz, 1983, 1994).

Based on this database, there is compelling evidence to support the hypothesis that people are able to use intentionality to bring about changes in distant target systems under conditions that preclude conventional sensory or motor exchange. At the least, the findings are intriguing and worthy of further research; at the best, the data have profound scientific, social, and philosophical implications.

One promising area of research involves the influence of human autonomic nervous system activity by a distant person. Braud and Schlitz (1992) reported statistically significant differences across a series of 13 experiments in which periods of intentionality to affect the physiology of a distant person were interspersed with counter-balanced control periods. This research led to the development of a protocol designed to measure the degree to which people are able to unconsciously detect someone observing them from a distance.

Many people have had the experience of being stared at from a distance, only to turn around and discover a pair of eyes gazing upon them. Indeed, survey data support the widespread distribution of these experiences. As early as 1913, J.E. Coover reported that 68-86% of respondents in California had this type of experience on at least one occasion. A survey of the Australian population reported that 74% of the respondents had such an experience (Williams 1983), 85% within a student population at Washington University in St. Louis, (Thalbourne and Evans, 1992) 94% of those surveyed in San Antonio, Texas (Braud, Shafer, and Andrews 1990), and 80% of those informally surveyed in Europe and America (Sheldrake 1994).

Several attempts have been made to explore these claims within a laboratory setting. A review of this literature was reported by Braud, et al. (1990), who identified four studies. The first was conducted by E.B. Titchener, a Cornell University psychologist during the late 1800's. While a brief article on the work reported negative results, he did not provide details of his study.

In a slightly later study, Coover (1913) conducted a study on remote staring in his initial work as the Thomas Welton Stanford Psychical Research Fellow in the Psychology Department of Stanford University. Each of 10 subjects made 100 guesses as to whether or not they were being stared at by an experimenter seated behind them in the same room. A random schedule of remote observation (RO) and non-observation periods was determined by the rolling of a die. Each observation period was of a 15-20 second duration over a several hour series of sittings spanning a period of weeks. Having obtained chance results, Coover interpreted his findings as support for the belief that staring detection was empirically groundless.

A second study was carried out in 1959 by J.J. Poortman (1959) of Leyden University in the Netherlands. In this study, the two people were separated in two rooms but still within sensory range. The experiment spanned a 13-month period. The remote/non-remote observation intervals were of 2-5 minute duration based on a random sequence determined by card shuffling. This resulted in a 59.55% accuracy rate (p=.04 1-t).

A better controlled experiment than the previous two was reported by Donald Peterson (1978), a graduate student at the University of Edinburgh. Following two informal pilot studies, the investigator made use of a procedure in which the subjects were positioned in separate, adjacent closed cubicles. One-way mirrors and special lighting provided visual perception in one direction and button pushes were used to measure the subject's perception of RO/non-RO periods. In 36 experimental sessions, each of six minute duration, there was a significant effect (p=.012, 2-t).

This experimental design was further improved by Linda Williams (1983), a student in the Psychology Department of the University of Adelaide (South Australia). Subjects were positioned in rooms at a 60 foot distance and were monitored via a closed-circuit video camera/monitor arrangement. Through the use of carefully controlled randomization procedures, the author reported significant RO detection guesses (p=.04, 1-t).

Based on the four experimental studies, Braud, et al (1990) concluded that there is suggestive evidence to support the hypothesis that people can consciously discriminate periods of RO from non-RO under conditions that controlled for subtle sensory cues. The effect size in these studies was not particularly strong, however. This, according to Braud and his colleagues, was due to the fact that "the testing method used in these studies was not the most appropriate one" (p. 17). In particular, the authors argued that the use of conscious guessing might be less relevant to everyday life experiences, in which RO detection takes the form of bodily sensations and spontaneous behavioral changes. For example, people frequently report the prickling of neck hairs or the tingling of the skin.

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With these considerations in mind, Braud, et al (1990) designed an experimental procedure based on the hypothesis that remote observation may be detected at the level of sympathetic autonomic nervous system activity. In a series of three experiments (Braud, Shafer, and Andrews 1990, 1992), a person stared at a distant subject through the use of a closed-circuit television system while the autonomic nervous system activity of the subject was being monitored via chart recorder and computer. The experimental design, like previous studies involving remote mental influences on human physiology (e.g., Braud and Schlitz 1989, 1992; Schlitz and Braud, 1986) allowed a within-subjects evaluation of RO versus non-RO (control) periods. The researchers reported that the electrodermal properties of receivers correlated significantly with the intense attention of the isolated and remote experimenter (i.e., $p=0.009$, effect size per session=0.59). Results were bi-directional, depending on the attitude of the Observer.

In addition to the main effects, Braud et al (1992) reported a positive correlational trend between social avoidance and the degree of change in the subject's electrodermal activity. This was measured by administering the Social Avoidance and Distress (SAD) scale (see below). Increasing degrees of social avoidance/distress/anxiety were also found to positively correlate with introversion.

The present experiments were designed as conceptual replications of the work by Braud, Shafer, and Andrews. Further, we extended previous studies of remote influence on autonomic nervous system activity by Braud and Schlitz (1989, 1992). Two formal predictions were made. First, we anticipated a significant difference in the mean rate of autonomic activity in experimental compared with control conditions across subjects. Second, we predicted the direction of the effect by instructing the remote Observers to activate the distant person. As such, we predicted an increase in autonomic activity during remote observation as compared with control conditions.

In addition to the primary hypotheses, we anticipated a significant correlation between social avoidance and the remote observation effect. On an exploratory basis, we also examined the social relationship between Remote Observers and Observees; this included the interaction of gender and cross-gender pairs.

METHODS

Apparatus

The equipment utilized in this research included silver/silver chloride palmar electrodes, a skin-conductance amplifier, an analog-to digital converter interfaced with an IBM microcomputer, a SUN computer with modem, and a closed circuit television, that included a color video camera, two VCR's, two video monitors, and a tripod to hold the video camera. The camera's radio frequency output was boosted by a 10 dB amplifier then conveyed via shielded cable to the color monitor in the Remote Observer's room.

Assessments

During Experiment 1, each experimental participant completed four forms/assessments. The first was a consent form. The second was used in preliminary screening and consisted of general biographical information as well as a health condition assessment. Third was a psychological inventory measuring introversion/extroversion through the use of the NEO Personality Inventory (Costa & McRae 1985). This instrument measures six facets of extroversion, including (1) Warmth, (2) Gregariousness; (3) Assertiveness; (4) Activity; (5) Excitement Seeking; (6) Positive Emotions. The fourth assessment was the Social Avoidance and Distress scale (SAD), which measures social-evaluative anxiety (the experience of distress, discomfort, fear, and anxiety in social situations) and deliberate avoidance of social situations. This self-report scale emphasizes subjective experience, and it excludes physiological signs as well as times related to impaired performance. In Experiment 2, the NEO Personality Inventory was not used, due to the fact that participants generally disliked the assessment based on redundancy of questions and length of time needed to complete the form.

Subjects

Each of the two experiments involved 24 trials. In Experiment 1, this consisted of one person per trial as the experimental "target" or "Observee" and 4 remote "Observers," each working with different target persons during 6 sessions. In Experiment 2, 16 subjects participated, with 5 subjects contributing two or three sessions each. This was done on the basis of the expressed interest and availability of some volunteers. Under the null hypothesis, this repeated use of participants does not violate statistical assumptions about the remote observation effect (Utts, n.d). Further, no claims are made about the generalizability of the effect in the general population, since all participants were self-selected on the basis of their interest in the study or their relationship to the experimenters.

Volunteers were recruited by MJS through notices that were handed out or posted in the greater San Francisco Bay area, as a result of lectures at neighboring universities and professional societies, as well as through personal contacts. Observers were drawn from the subject pools of the Cognitive Sciences Laboratory and from the same community as used for recruiting Observees. The age of all participants ranged from 16 to 60. They were in good health based on the health assessment.

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Experimental Procedure

The basic experimental design was the same for both experiments; exceptions to this are outlined following the general description. Subjects were greeted by the experimenter in the Cognitive Sciences Laboratory at Science Applications International Corporation. They were treated in a warm and friendly way. Following a brief "get acquainted" period, the experiment was explained to them. They were encouraged to ask any questions and to understand the nature of the study. They were introduced to the "Observer" with whom they would be working and were told that the "Observer" would try to get their attention or "wake them up" during randomly selected periods. Efforts were made during this period to ascertain the types of images or thoughts that might be useful to the Observer in order to startle or excite the Observees. Hence, the participants were aware of the hypothesized direction of the effect, although they were blind as to the order, number and duration of the sampling periods. This differed from the Braud, et. al studies during which no direction of effect was hypothesized and Observers were instructed to simply look at the distant person's image--rather than trying to influence the person directly. Rather, the goal of influencing the distant person in a pre specified direction was based on previous research on remote mental influences reported by Braud and Schlitz (1989).

Three rooms were used for the experiment (see Figure 1). During an experimental session, each volunteer was taken to an experimental room, where they were seated in a chair and the skin electrodes attached to the palm of their non-dominant hand. As was the case in the Braud, et al studies, they were asked to complete the experimental forms with their dominant hand, keeping their non-dominant hand as still as possible. A video tape called *Illuminations*, which provides amorphous colors accompanied by a musical sound track, was played for the volunteer on the VCR and headphones in the experimental room. The presentation timing of this video was held constant throughout the experiment. This VCR was not in any way connected to the experimental equipment used to measure the remote observation effect. The Observee was told that the video camera would be on throughout the session, but that the remote Observer would be watching them through the monitor in the distant room only at certain randomly determined times. The Observee was asked not to try to guess consciously when those periods (of which the Observee was kept "blind") might be occurring, and was told that we were exploring whether unconscious physiological reactions might be associated with RO.

The experimenter (MJS) left the subject alone in the experimental room and moved to the computer, which was set up in the adjacent control room. The experimenter checked the electrode conductance. Following this, she returned to the Experimental Room, started the *Illuminations* videotape, and closed the door. The audio track on the video controlled for the possible influence of extraneous sounds that might influence the Observee. She passed through the computer room, crossed the hallway, and entered the Observer's room, advising the Observer that the session was about to begin and wished the Observer luck, and reminded them to activate the distant person when their image appeared on the experimental monitor. She then closed the Observer's Room door and returned to the Computer Room.

At this point, the experimenter started the microcomputer that controlled the session events, including timing of the physiological sampling periods and recording of data during 32 30-second periods. As such, the experimenter was completely blind as to the sampling periods during any interactions with the participants. Each of the 16 recording periods during the experimental (RO) conditions of the experiment was signaled to the remote Observer when the distant person's image appeared on the monitor in the Observer's Room. During these periods, the Observer stared intently at the television image throughout the 30-second recording period. During control periods, the Observer read a book or otherwise tried to shift their attention from the distant person.

The Remote Observer received no feedback during the session about the Observee's physiological activity. The equipment sampled the Observee's spontaneous phasic skin conductance responses (SCR) once a second for the 30 seconds of a recording period. A random pause of 0 to 5 seconds was inserted in order to eliminate potential artifacts due to possible guessing of the experimental sequences and to rule out possible cycles that might occur in the Observee's physiology. The experimental sampling then continued with the next block. The subjects were randomly assigned to one of two experimental sequences that were counter-balanced for time effects across the experiment. The randomization sequence was generated by the second author (SB) through the use of a random number generator. These consisted of blocks of four conditions: control, observation, observation, control or observation, control, control, observation. These sequences were randomized in blocks of 6, with equal numbers of the two conditions across the experiment. This was done to assure a balance of two conditions and to control for any temporal drift in the autonomic activity of the participant. Digitized data were stored on disk for later analysis and copied over to the SUN system for backup security and transport via modem to the second author. The mean value of skin conductance activity for each 30-second period was used in the analyses.

RESULTS

For each experimental session, a total score was calculated for all 32 recording periods (16 observation and 16 control). A chi-square goodness of fit test indicated that the scores of these sessions did not differ significantly from normality; therefore, parametric statistics were used in their evaluation. A single mean t-test was calculated with 23 degrees of freedom for each of the

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two experiments. In Experiment One, the obtained t-value was 1.878, $p<.036$ (1-t), es=.36. In Experiment Two, the obtained t value was 2.360, $p<.014$ (1-t), es=.44. As a pre-planned analysis, the combined results of the two experiments were combined, yielding a significant t-value of 2.652, $p<.005$ (1-t), es=.36, with 47 degrees of freedom. These results supported our two primary hypotheses, providing significant differences in the autonomic activity of Observees during RO and non-RO conditions in the direction of autonomic nervous system activation.

Secondary analyses were computed for the psychological data collected on the basis of the NEO and SAD assessments for experiment 1 and on the SAD assessment for experiment 2. Linear correlation coefficients (Pearson r's) were calculated but no significant relationships were found. To assess the ROE-SAD relationship, Pearson r's were computed for the percent electrodermal activity occurring during the RO versus the SAD scores. Again, no significant relationship was found.

In the first experiment, it was noted that there was a relationship between the gender of "Observer" and of the "Observee" in the remote observation experiment. As such, it was decided to analyze this sex pair relationship across the two experiments. This was done through the use of a 2x2 ANOVA (see Figure 2). Results yielded a significant interaction across sex pairs ($p<.01$, 2-t). Opposite sex pairs showed a larger experimental effect than same sex pairs.

ALTERNATIVE HYPOTHESES

Various alternative hypotheses to remote observation may be considered to account for the obtained results. These are described below, as well as the rationale for discounting each of them.

(1) *The results are due to internal rhythms that may have influenced the Observee's autonomic nervous system activity.* This potential artifact has been ruled out by utilizing a random and counter-balanced schedule of experimental and control periods.

(2) *The results are due to sensory cues or other uncontrolled external stimuli.* Based on the experimental design, this alternative hypothesis can be rejected. There were no known or obvious factors that could have influenced the Observee based on the random schedule of experimental and control periods.

(3) *The results are due to chance correspondences between the Observer's observations and the Observee's physiological responses.* The use of conventional statistical techniques, as well as the existence of effect sizes in the predicted direction, minimize the likelihood of coincidence. Of course, such a coincidence is expected to occur once in 200 experiments, according to our statistics.

(4) *The results are due to recording errors or motivated misreadings of the data.* The data were recorded through the use of an automated procedure that eliminated human error in data recording.

(5) *Observees knew the target sequence and so manipulated their physiology to conform to the experimenter's expectations.* The use of a random sequence that was accessed after all pre-experimental interactions with the Observee ruled out this potential artifact.

(6) *The results are due to arbitrary selection of data.* The number of trials and subjects was specified in advance and the reported analyses include all recorded data that fell within the experimental protocol.

CONCLUSIONS

This research provides an independent conceptual replication of the remote observation experiments conducted by Braud, et. al, under conditions that rule out conventional sensory exchange between experimental participants. The work builds upon an increasing data base suggesting that people are able to interact with one another at non-sensory levels, including the mental influence of one person upon another person's physiology (e.g., Braud and Schlitz 1989; May and Vilenskaya, 1994).

As is often the case in research, the findings raise more questions than answers. More research is needed to better understand the mechanisms at play in this work. For example, a larger study designed to systematically manipulate the direction of the effect would be useful. Another promising area of research would address the possible role of influence as compared with information acquisition in an ostensible information exchange process. Following the work of May, Radin, Hubbard, Humphrey, and Utts (1986), this leads us to ask whether the results can be accounted for by a distant influence on the part of the Observer or to a passive responsiveness on the part of the Observee. Lastly, more research is needed to assess the degree to which Remote Observation effects can be limited, blocked or shielded. Such questions are essential to the development of a truly progressive research program (Lakatos, 1978).

This work, in the context of previous research by independent researchers, has significant implications for our understanding of human communication processes and for a reevaluation of a worldview in which humans are seen as isolated beings. Furthermore, the results suggest the need for a broader approach to human consciousness than that held by the conventional, reductionistic, scientific paradigm (Harman, 1991).

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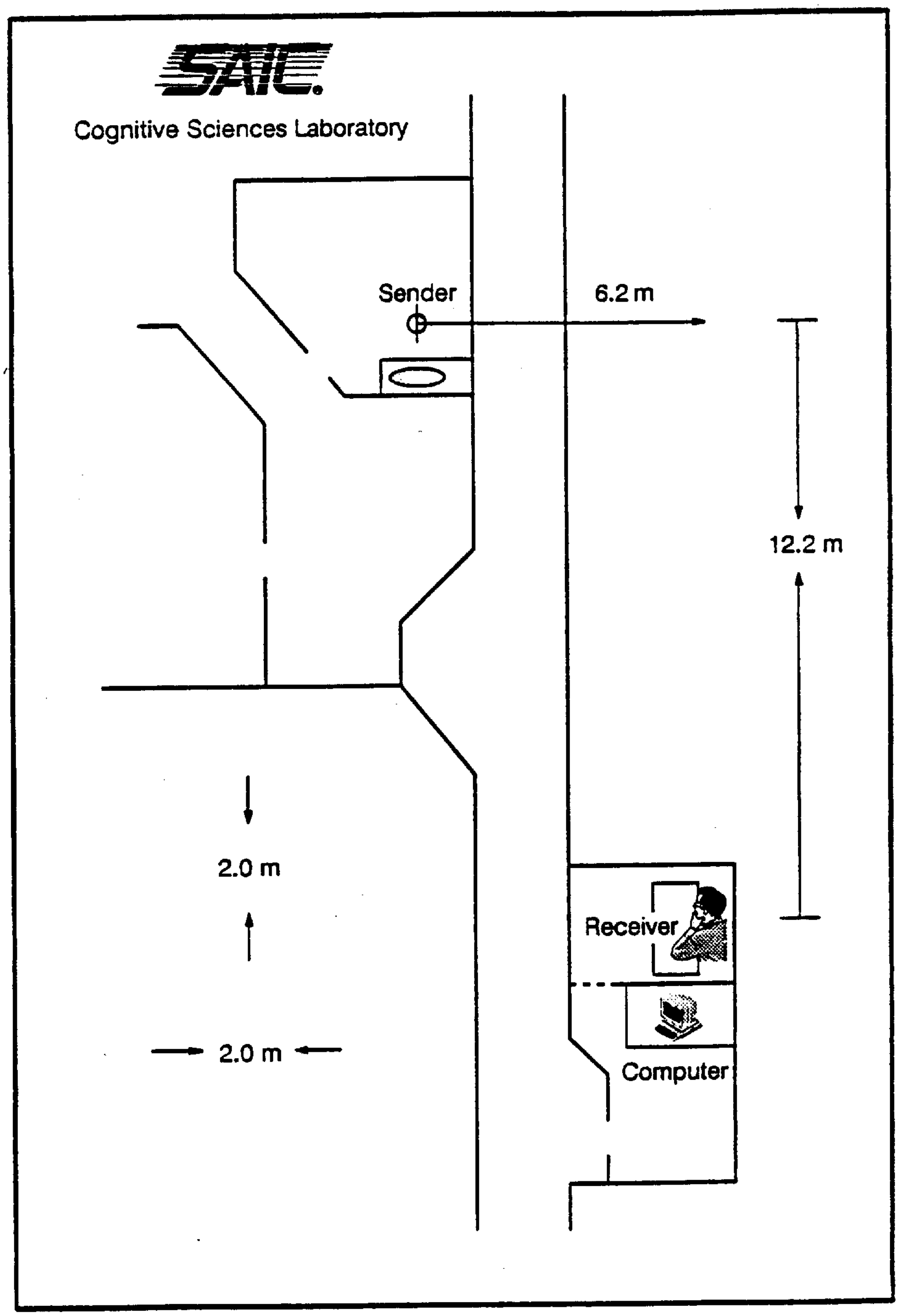

Figure 1: Floor Plan for Remote Observation Experiment
Observee-Observer Distance = 13.7 m.

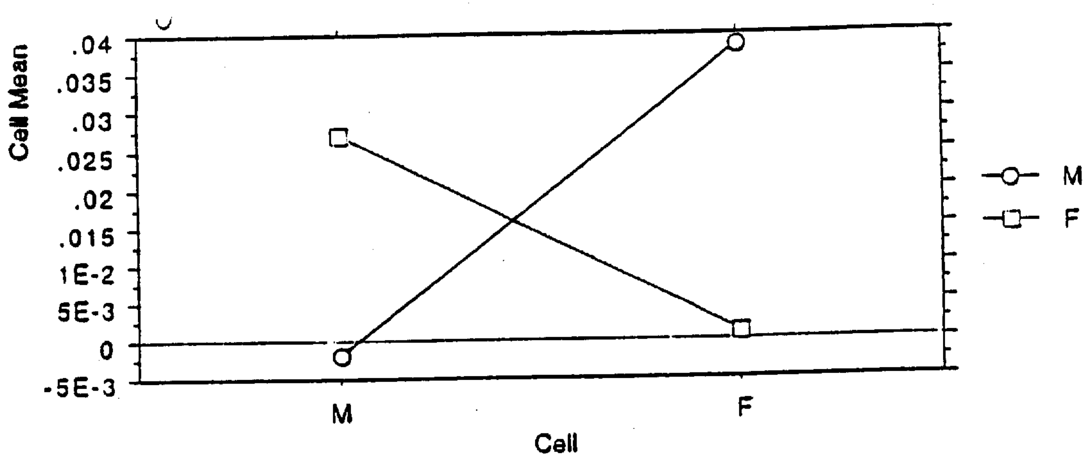

Figure 2: Interaction line plot for gender pairings (opposite sex and same sex) and skin conductance activity