INSTITUTO DE PSICOLOGIA PARANORMAL

BIAL FOUNDATION RESEARCH PROJECT 2013-2014

ENHANCING PSYCHOKINESS TASK PERFORMANCE THROUGH THE PRACTICE OF IMAGERY STRATEGIES

(STAGE 2) – Grant 10/12

By Alejandro Parra & Juan Manuel Corbetta

INSTITUTE OF PARANORMAL PSYCHOLOGY, Inc.

Salta 2015 (C1137ACQ) Buenos Aires, Argentina.

rapp@fibertel.com.ar

FINAL REPORT

Enhancing Psychokiness Task Performance Through the Practice of Imagery Strategies (Stage 2)

Grant 10/12

By Alejandro Parra & Juan Manuel Corbetta

SUMMARY. Parapsychology can be defined as "the study of apparent new means of communication or interaction between an organism and elements in its environment" (Morris, 1989). Traditionally there have been two main categories, extrasensory perception (ESP) and psychokinesis (PK). For PK, the organism appears to be exerting an influence on an environmental target. PK becomes anomalous output from the organism; the target, then, is analogous to a receiver and the organism to a source. Although this dichotomy can be useful heuristically, many authors have noted that the distinction is difficult to maintain experimentally. The present research project part of an attempt to clarify the concept of PK and empirically explore it more effectively. We are especially concerned with attempts to demonstrate and explore PK systematically. During any formal or informal attempts to induce a PK effect on demand so that it can be examined, the participant is encouraged to engage in some sort of volitional activity (e.g., wishing, willing, wanting, intending, and so on). This can be done indirectly through some sort of external "motivator," such as that used in studies where a physical source of noise or randomness is linked with an outcome of known importance to the participant (access to food, warmth, and so on). This method generally uses a simple target system capable of producing essentially random outcomes, such as the face of a die or a display driven by a random number generator (RNG). This research project aimed at exploring the role of volition in RNGM tasks. Three volitional (imagery) strategies were examined: (1) goaloriented, (2) processoriented, and (3) endoriented (final result) strategies. A number of participants practiced each one of the three strategies on six occasions. In both studies, the three strategies was carried out in order to enhance the PK scoring or increase PK scores over a period of time (as we predict), thus to confirm earlier findings with imagery strategies and PK. There is suggestive evidence that these imagery procedures may be able to produce PK results. Of special interest are the goaloriented imagery strategies. Marginally significant PK effects occurred under the "nonfeedback" conditions of these experiments. These conditions could more accurately be called "limited feedback" conditions. The importance of these findings lies in the suggestion that immediate, trial-by-trial feedback does not appear essential to the occurrence of experimental PK.

INTRODUCTION

Psi research on unselected subjects appears to produce sporadic results, too inconsistent at present to allow development of an effective processoriented research program. Although research with "gifted" individuals can produce impressive results, they seem limited in their generalizability and often dependent upon the unique interpersonal dynamics of the research team involved. For a variety of reasons (Child, Honorton, Kelly, Morris, & Stanford, 1980) we have therefore chosen to focus on techniques for training individuals to develop and maintain psychic functioning. To this end, we have conducted a preliminary survey of the popular literature by over fifty authors on such techniques (Morris, 1977). The present study is an attempt to explore two different visual imagery strategies that this literature advocated for the intentional production of PK phenomena.

As we examined this literature, we looked for common themes. Almost all of the writings on PK advocated the use of visualization oriented toward the subject`s intended goal. Two kinds of visualization strategies appeared very frequently and seemed to be amenable to a variety of experimental situations. One strategy involves selecting the final goal or outcome that one wishes to produce, then picturing that outcome vividly in the mind's eye. If one wishes to heal a wart on a knuckle, one visualizes the knuckle skin in perfect health, without the wart, looking as one desires it to look (the goal). We have referred to such strategies as "goaloriented" strategies since it is the final goal or outcome that is visualized. The other strategy involves selecting some sort of process or series of happenings that naturally lead up to the desired outcome, then visualizing those processes taking place. In healing the wart, one visualizes ointment dripping on the wart and gradually dissolving it, a knife slicing away the wart, or any other process, realistic or fictional, that can be conceptualized as leading to the outcome desired. This strategy, which we have referred to as "processoriented," can be employed in a greater variety of ways, generally involving visualization of something happening rather than a static snapshot as in the goaloriented strategy.

Although several studies have asked research participants to employ one or more specific mental strategies in PK tasks, only two have incorporated visualization specifically. Stanford (1969) compared visualization with a releaseofeffort strategy. He asked his participants to visualize dice coming to a stop with the desired number of pips showing on top, for half of their runs. For the other half they were asked to freeassociate to the desired number for two minutes preceding the run, then divert their attention during the actual run itself. Both strategies yielded results very close to chance. However, those who tended to give concrete sensory associations to the numbers tended to do better on the visualization task. Stellberg (1975) compared visualization with "focusing willpower." For half of the runs in his experiment, participants were asked to visualize the target face of the dice while looking away; they could have eyes open or closed and were allowed to generate imagery associated with the target numbers. For the other half, participants were asked to watch the dice, tense their muscles, and "focus their willpower" to make the dice conform. The visualization strategy produced nonsignificantly positive results; the focused willpower strategy produced significantly negative results.

Each study thus contrasted visualization with a strategy not necessarily involving visualization, and the results may be strongly dependent upon the nature of the nonvisualization task. In the present research we decided to examine the process and goaloriented strategies as described earlier in order to explore whether either or both would be useful in affecting the observed outcome of a random number generator (RNG). We chose as our outcome display a smaller version of the circle of lights" display developed by Schmidt (1970) because Schmidt had had considerable success with it and it was easy to adapt our two imagery strategies to it.

PARAPSYCHOLOGICAL EXPLORATION

Apparatus

The apparatus consisted of a fourmodule multipurpose testing system designed for a variety of studies (Placer, Morris, & Phillips, 1977). In its main console, it maintained an internally generated source of random binary decisions by amplifying Zener diode noise with a twotransistor amplifier, then converting the amplified noise to logic levels with an LM 330 comparator. The resulting logic signal was then divided by 2 to insure that equal time would be spent in the high and low states. This random logic signal oscillated at frequencies up to about 200 kHz, and it could be sampled and clocked into a shift register whenever a new random decision us desired. A counterdecoder sequencing circuit then interfaced this information with two other consoles. One console was the target console. Whichever outcome/ decision was to be designated as target for a given set of trials was entered by keyboard in advance of the trials. After each trial, the target outcome was compared with the outcome of the RNG by a logic circuit. If they matched, a hitcounter on the main console registered a tally; a second counter tallied each irial: and the two counters together provided a cumulative tall of trials and hits.

A second console was the display console. The display to the subject consisted of a ring of 16 lights. each light being a red lightemitting diode that was in diameter. The entire ring was in diameter, mounted on a D) 10 x 4 cin gray metal box attached to the subject console. The binarv random decisions were employed to advance the illuminated one step clockwise or counterclockwise, thus producinz a random back and forth around the circle. Input to the console followed input to the counters in the main console and wats accomplished through a second circuit. Treatment of the display console in no way could affect input to the counters, given the wav the cii7ciiitry svas arranged. The display console could be disconnected without affecting the counters. The main console and tarcret console were housed in 45 10 South Hall, on the UCS15 campus: the console, including display, was housed two rooms awav in 5 1 1 South Hall.

Participants

The sample included 62 participants, both 40 females (71.4%) and 22 males (28.6%), their ages ranged from 19 to 77 years (Mean= 48.47; SD= 11.02). Subjects were recruited by announcements in newspapers and magazines and by brochures distributed in conferences hold at the Institute of Paranormal Psychology and other centers. Interested persons were in touch by phone, e-mail, or by letter with the Institute in order to request an interview for the experimental session. We designed a web page and host it in our web site for recruit subjects to add to the sample (*http://www.alipsi.com.ar/talleres.asp?id_taller=5*), from which we selected only the inquiries of the Argentines. The receiver did not receive information about characteristics related to the hypothesis of the experiment before the session.

Procedure

The procedure of each session was as follows. Each subject was met by Experimenter 1 and shown the main console containing the Zener diode and processing circuitry. The subjects were told that this was an exploratory test of PK, that they would be asked to influence the output of an RNG by focusing their attention on the circleoflights display since it would give them feedback and represented the outcome of the electrical events they were attempting to influence. They were told that successful studies had been done using such procedures, that some people seemed successful at the task, and that we were exploring the effectiveness of two specific imagery strate for such a task. Each subject was then taken down a hall to Institute of Paranormal Psychology, two rooms away from the first room (and about from the Zener diode and main console), and was seated in an office chair in front of the subject console and the circle of lights. The subject was shown how to initiate a run by pressing a button on the subject console so that the illuminated light would shift around the circle 16 consecutive times at the rate of one shift per 1.75 seconds. The subject was then told that the task was to bias the lights for each run of 16 trials in either the clockwise or the counterclockwise direction, depending on the instructions given the subject in a concealed target envelope.

The subject at this time was also given two specific imagery strategies, a processoriented strategy which involved visualizing "energy" building up inside the body, then flowing out to the circle of lights and assisting their progression in the desired direction; and a goaloriented strategy which involved the subject's pointing a finger at the light he wished to be illuminated next and vividly visualizing the light being lit, i.e., visualizing the goal for the trial (see the Appendix for the exact instructions). The subject was told that both imagery strategies had been suggested by a search of the literature and that we felt that each would be useful for the present task. The strategies were referred to as goaloriented strategy and processoriented strategy rather than processoriented and goaloriented, in order to avoid biasing the subject.

The subject was then shown the target envelope, which Experimenter 2 (Parra) had earlier selected at random and placed on the table. He was asked to relax and take two or three minutes to build up imagery between eight runs he would be allowed five minutes to relax and prepare mentally for the next imagery strategy. Thus each subject used each imagery strategy for half the session, with the clockwise vs. counterclockwise target direction balanced across conditions. There were eight target envelopes, each of which contained a different specific order of directions (clockwise and counterclockwise) for each of 16 runs (the length of the experimental session). This order was counterbalanced for direction within the first eight runs (four clockwise and four counterclockwise) and the last eight runs such that each subject would be asked to influence the behavior of the lights in a clockwise direction for half the runs and counterclockwise for half the runs. Half of the available target orders listed M 98 first and the other half listed PK first. In advance of each session, Experimenter 2 combined a random component ofthe weather information for the previous day with a set of random digits between 1 and 8 obtained from the RNG before the study to select which of the eight target instruction sheets would be target for the session and which of the eight envelopes would be used to enclose the targets. Experimenter 2 placed the target envelope by the subject's console just before the start of the experimental session. Thus Experimenter 1 did not know the target order for each session and could not infer it, either from the appearance of the target envelope or from keeping track of which target orders had been used previously. Subjects were told only that their target envelope had been selected randomly from a set and that Experimenter 1 was unaware of the contents.

If subjects had no further questions, they were then asked to sign a consent form in which it was made clear to them that they could terminate their participation at any time, that we were investigating a potential new form of communication whose existence was still debated, and that their success or failure in this study should not be taken as an indicator of their abilities to succeed at such tasks in other contexts. The subject was told not to open the target envelope until Experimenter 1 left the room. Experimenter 1 then returned to the main console room.

Upon his return, he checked to make sure that the target console was set to tally only clockwise steps as hits, in order to eliminate biased recording errors, as explained below. He gave the subject five minutes to prepare, and then instructed him over a oneway intercom to begin run 1. When the trial counter on the main console registered 16 trials, it stopped automatically. Experimenter 1 recorded the number of trials and the number of clockwise steps taken (as registered on the hit counter). At the end of each run he notified the subject of the run number just completed and the number of the next run. At the end of 16 runs, Experimenter 1 retrieved the target order sheet from the subject, entered the key number of the target sheet, recorded the target directions for all 16 runs, scored the record for total number of decisions in the assigned direction, and gave the subject some general feedback. At the end of the session, Experimenter 1 turned over a carbon copy of the unscored record to Experimenter 2 for independent tallying. Experimenter 2 then verified that the number of the target sheet matched that assigned randomly to the session and that the target order had been properly recorded. All critical variables such as length of run were specified in advance and were not changed during the experiment.

Note that since the hit counter always tallied clockwise decisions and Experimenter 1 was unaware of whether the target for a given run was clockwise or counterclockwise, we do not have to be concerned with biased recording errors. Experimenter 1 recorded the number of clockwise decisions, then converted these scores to number of hits by comparing them with the target order obtained from the subject. This conversion of scores to hits was independently checked by two other scorers.

Results

First, was there evidence for PK overall or in any of the conditions. The random event generator produced decisions in accordance with the subject's instructions (hits) 51.9% of the time ($Z = 2.38$, $p < .02$, twotailed). Almost all of the positive scoring occurred with the goaloriented imagery, which produced 52.9% hits and was independently significant ($Z = 2.61$, $p < .01$, twotailed). The Z score (or critical ratio) has been used traditionally to assess whether or not an overall extrachance effect is taking place; it is a general statistical test in that it does not discriminate between strong effects manifested by a few individuals vs. weak effects by many individuals.

Of more direct interest was whether or not the PK scores throughout the subject sample were meaningfully different from chance, either overall or within each of the imagery conditions: thus at statistic was used in evaluating these scores. In contrast to the former procedure, the latter procedure incorporates consistency across subjects into the assessment of statistical significance. For example, an abovechance but nonsignificant overall scoring rate would yield a significant t statistic if all subject scores were at or near the average, while a significant overall rate could be nonsignificant by the t procedure if obtained by averaging a few very high subject scores with other scores that were at or below chance. The mean deviation from chance of the total scores for all subjects was + 4.75 (see Table 1); this deviation was statistically significant at $p < .05$, twotailed ($t = 2.36$, with 15 df). The mean deviation from chance of the goaloriented imagery PK scores was +3.69; this deviation was not significantly different from chance ($t = 1.84$, with 15 df, $p < .10$, twotailed). The mean deviation from chance of the processoriented imagery PK scores was + 1.06; this deviation was riot significantly different from chance ($t = .99$, 15 df, $.20 < p < .40$, twotailed). The difference in number of hits per session per condition between the two procedures was not significant ($t = .872$, with 15 df, $p < .40$, twotailed). Thus there is suggestive evidence that these imagery procedures may be able to produce PK results. Of special interest are the goaloriented imagery strategies.

MAIN STUDY

A second study was carried out to confirm these results and to explore both imagery strategies within the context of a potential training procedure. At this stage, although we were more encouraged by the goaloriented results, we were still interested in the possibility that each strategy could be useful in helping people develop PK abilities. Perhaps individual differences in some variable such as past exposure to mental development techniques or imagery ability, we thought, might affect preference for one technique over the other, as well as success with one technique more than the other. Those already exposed to mental development techniques might find it easier to become involved with the more complex processoriented imagery technique than those who had not, for instance. One kind of PK training procedure of interest to us involved exposing trainees to both techniques, then letting them choose which one they wished to focus on during their training.

Procedure

The procedure for the first session was the same as for the previous study. Following the first session, Experimenter 1 asked the subject to select a preferred imagery strategy and to use it exclusively during the second session two weeks later. The subject was then taken in to Experimenter 2, who gave him instructions for two simple concentration exercises which were to be practiced daily until the second session. One exercise involved concentrating on the sweep second hand of a watch for ten minutes; the other involved counting one's breaths for five minutes. In each case subjects were told ' that whenever they found their attention wandering, they should gently but firmly return their attention to the assigned stimuli. During the second session, the sub . ect repeated the experimental procedure, this time using the preferred imagery strategy for all 16 runs. The experimenter was not blind to which imagery strategy was used. At the end of the session the subject was invited to describe the experiences in detail and was given specific feedback as to results.

Results

The first and second sessions were analyzed separately, since different questions were being asked of the data. For the first session, we wished to examine whether goaloriented results continued to be better than processoriented, whether having prior mental developmerit training affected results, and whether there was an interaction between imagery strategy and prior training experience. The hit rate during goaloriented imagery was 51.8% as opposed to only 48.4% during processoriented imagery (see Table 1). Prior training was not a significant factor ($F = .67$, with 1 and 18 df, p = n.s.). However, there was a significant interaction between imagery strategy and prior training ($t = 7.81$, with 1 and 18 df, $p < .02$). Close inspection of the results revealed that the subjects with prior mental development training showed relatively little difference between imagery strategies, whereas those without showed a strong difference in lavor of goaloriented imagery. A post hoc analysis showed that the difference between the two imagery conditions for the nontrained subjects alone was statistically significant ($t= 3.41$, with 18 df, $p < .01$, twotailed). Thus the results of Session 1 confirmed the mild success of the goaloriented imagery procedure and indicated that the lack of success with processoriented imagery may have been in part due to a negative response toward it by those who had not received prior exposure to mental development procedures.

The results for the second session were consistent with those ofthe first session with regard to imagery strategy. No analysis of'variance comparing imagery strategy with prior training experience was attempted on the second session data because of the small number of data points that would be in each cell. Our focus instead was on the success of each imagery strategy and on whether goaloriented imagery would continue to be better than processoriented imagery. One subject declared that his imagery the second time around was a combination of the two strategies ' and his data are therefore not iii(luded in any analyses comparing imagery strategies in the followup

Eleven subjects chose to employ processoriented imagery throughout the session; their hit rate was 49.3% (t= .71, with 10 df, p= .40, twotailed). Eight chose goaloriented imagery and their hit was 52.6%, which was significantly above chance (t = 4.41, with 7 .01, twotailed). The difference between these two groups is significant (t = 2.46, with 17 df, p < .02, twotailed).

PK Imagery Research

In the experimental literature, very little attention has been paid to the role of specific volitional activities-the mentation involved in intending, wishing, willing, wanting the target to behave in accordance with the instructions. The only systematic exploration of volitional activities has consisted of a few studies conducted to explore the effect 'of visual-imagery strategies on PK performance. These studies have mainly examined two strategies: goal-oriented imagery which is a visualization of a desired goal or outcome of a PK trial and process-oriented imagery, which is a visualization of a process leading to a desired goal or outcome of a PK trial. There are six studies on record that can be considered to have explored the role of goal-oriented imagery in the generation of PK (Levi, 1979; Morris & Reilly, 1980; Morris, Nanko, & Phillips, 1982; Nanko, 1981; Stanford, 1981; Steilberg, 1975). All six studies yielded PK scores in the positive direction for goal-oriented imagery. The PK scores were significantly above chance in three of the six studies when trial-by-trial feedback of performance was provided (as an experimental variable in Levi, 1979, but as the essential experimental design in the studies by Morris et al., 1982, and Nanko, 1981).

In general, imagery PK studies have suggested can be summarized as follows:

(1) Goal-oriented imagery may be important in the generation of extrachance PK scoring.

(2) Goal-oriented imagery does not seem to produce first-session effects (Morris et al., 1982; Nanko, 1981).

(3) Goal-oriented imagery may be associated with higher PK scoring than process-oriented imagery

under trial-by-trial feedback conditions (Levi, 1979; indirect suggestion from Morris et al., 1982, who only used the feedback condition).

(4) In the absence of trial-by-trial feedback, process-oriented imagery may do better than goal-oriented.

An attempt was made to design the experiments such that the results could be examined with respect to two prominent models in parapsychology, which serve as alternatives to the usual notion of real-time trial-bytrial volitional effects. One was the before-mentioned IDS model of May et al. (1985), which attempts to explain anomalous bias in RNGs without invoking PK. IDS refers to individuals being able, for instance, to select locally deviant sub-sequences from a longer random sequence by using psi-acquired information. According to the IDS model, the psi mechanism behind RNG results is intuitive data sorting of some sort, such as precognition. The other was Schmidt's (1982, 1984) quantum collapse (QC) model, a refined version of what have often been referred to as observational theories (OTs). Central to the QC model is the assumption that it should be possible for human observers to influence the output of a RNG by affecting the "collapse of the state vector" of binary probabilities. According to the QC model (and to OTs in general), the psi mechanism behind RNG results is PK that is triggered at the moment of observation.

Experiment 1. Each subject was assigned to practice one of three imagery strategies in between sessions. The subject came to the IPP on six occasions approximately one week apart to use his/her particular strategy on the PK computer test. In each of the six sessions, the subject did two 40-trial runs. One of the runs in each session was done with trial-by-trial feedback, and the other without such feedback (see Third Study)

The three imagery strategies were process-oriented imagery (PO), goal-oriented imagery (GO), and a new strategy designed by the first author, termed end-oriented imagery (EO). PO involved visualizing that energy was building up inside the body and that it then became a beam extending into the target on.the computer screen and pulling out the feedback display for a hit (a blue star). GO involved willing the feedback for a hit, the blue star, to occur by visualizing strongly its actual presence on the screen. EO involved willing the final number of hits per run to be a certain preselected favorable number by visualizing strongly that particular number's being displayed on the screen as part of the overall end-of-run feedback. EO was seen as a variation of GO because in both strategies subjects were to visualize feedback that was provided when they were successful at the PK task. EO was introduced to carry the research on GO one step further and explore whether the nature of the goal mattered, for example, the goal for each trial versus an overall goal for the displayed hit total at the end of the run (see Appendix A for full imagery instructions).

Method

Subjects. The sample included 62 participants, both 40 females (71.4%) and 22 males (28.6%). The subjects had been tested at the parapsychology laboratory. On the pretest occasion, subjects (who were mainly recruited through advertisements put up around the Institute of Paranormal Psychology) first completed psychometric tests: After completing all three groups. The subjects were kept blind to the other imagery conditions.

Each subject was asked to practice his/her particular imagery strategy between sessions for about 10 min/day. To keep a record of the home practice, each subject was given a diary and was asked to bring it back in the final session. In the diaries, the subjects wrote down the date of practice, the duration of practice, and how vividly he/she managed to generate the imagery strategy according to a five-point scale of vividness.

Procedure

For each subject, six sessions were required, each with two 40-trial runs on the PK test. A break was taken between runs. A flip of a coin decided whether the first subject who attended did the first run with the feedback or the nonfeedback mode (and the second run with the reverse mode). The next subject in the same strategy group had the reverse order of feedback and nonfeedback modes to that of the first subject, and so forth. When the first subject attended next time, he/she started doing the test with the reverse order of feedback and nonfeedback modes to that used in the first session. The first subject in the second strategy group had the reverse order of feedback and nonfeedback modes to that of the first subject in the first group. The first subject in the third strategy group had the reverse order to that of the first subject in the second group.

Another flip of a coin decided for the first subject whether the first half of both runs would be started with RNG or RNG. The second session for that particular subject had the reverse order of RNGs to that of the first session. The second subject in the same strategy group had the same order of RNGs as the first subject. The third and fourth subjects in the same group had the reverse order of RNGs to that of the first and second subjects, and so forth. The first subject in the second strategy group had the reverse order of RNGs to that of the first subject in the first group. The first subject in the third strategy group had the reverse order to that of the first subject in the second group.

In Session 1, the experimenter and the subject after a short discussion went to the sound-attenuated room where the experimenter typed the relevant information about the conditions of the first PK test run into the computer. The experimenter then left the subject alone with the PK test. After the first run, the subject called the experimenter and took a break. Then, the experimenter typed the relevant information about the second run into the computer, and the subject did the second run. After the PK test, the subject was given the Image-PK to complete and bring back in the next session or at latest before Session 4 started. At the end of the session, the subject and the experimenter had a short discussion.

In Session 2, the subject, after discussion and two runs of the PK test, was given the relaxation exercise (both verbally and written down on a sheet of paper) and was told to practice it immediately before practicing the imagery strategy at home before the next session.

In Session 3, after discussion and two runs of the PK test, the experimenter introduced the short concentration exercise that was to replace, or be added to (depending on whether the subject wanted to keep on practicing the relaxation) the relaxation exercise immediately before practicing the imagery strategy at home. We suggested to subjects that they might want to keep on practicing relaxation because, if done successfully, it could give more control over their strategy in the sense that it is easier to visualize if one is relaxed. Practicing relaxation before the strategy at home could also help the subject to relax better in the subsequent session and could bring about better visualization-the body being completely relaxed and thus not sending signals to the brain to compete for attention.

In Session 4, after discussion and two runs of the PK test, the experimenter introduced the simple visualization exercise to replace the concentration exercise before practicing the imagery strategy at home.

In Session 5, after discussion and two runs of the PK test, the experimenter introduced the positive-thinking exercise to replace the visualization exercise before practicing the imagery strategy at home. The subject could choose which of the three positive-thinking exercises that he/she wanted to practice.

In Session 6, after discussion and two runs of the PK test, the subject did the IT test again. Then the subject received the results of his progress through the six sessions. When the experiment was completed, the main findings were mailed to the 24 subjects.

Results

One hundred and forty-four sessions were conducted, totaling 11,520 trials. There were no dropouts. The t test yielded overall below-chance results (mean score = 19.93; $t = -0.22$ $p =$ n.s.). Usually, nonparametric tests were used for comparisons of two or more variables.

PO subjects scored nonsignificantly lower than EO subjects, which was the opposite direction to that predicted: Mann-Whitney test $U = 1{,}061$ ($z = -0.67$). PO was the only strategy that showed a slight incline in PK scores. For PO, the difference between scores on Sessions 1 to 3 (overall mean score = 61.13) and Sessions 4 to 6 (overall mean score = 61.50) was nonsignificant: Wilcoxon test, t ($N = 8$) = 15.5 ($z = 0.35$).3 For GO, the difference between scores on Sessions 1 to 3 (mean score = 59.88) and Sessions 4 to 6 (mean score = 56.13) was nonsignificant: Wilcoxon test, T ($N = 8$) = 10 ($z = 1.12$).

For EO, the difference between scores on Sessions 1 to 3 (mean score = 61.25) and Sessions 4 to 6 (mean score = 58.88) was nonsignificant: Wilcoxon test, T ($N = 8$) = 13 ($z = 0.70$).

Post hoc analysis. Three-way ANOVA was conducted to explore possible interactions between strategy assignment (PO, GO, and EO) and RNG used hits being the dependent variable. This analysis indicated no main effects for strategy, feedback, or RNG. The only suggestive main effect was for RNG, $F(1{,}564) = 2.60$ ($p = .10$), indicating a nonsignificant difference among the two types of PRNGs. The three-way interaction was not significant, $F(2{,}564) = 0.16$ ($p = .85$), and none of the two-way interactions were significant at the .05 level. The only suggestive two-way interaction was between strategy assignment and feedback conditions: $F(2{,}564) = 2.29$ ($p = .10$). This was mainly due to differences in means of EO feedback score (below chance) and EO nonfeedback score (above chance).

The subjects scored overall above chance in PO but below chance in GO, which is contrary to what Morris et al. (1982) found. The difference was in fact nearly significant: Mann-Whitney test, $U = 887.5$ ($z = -1.94$, $p = .052$, two-tailed). PK scores in feedback and nonfeedback conditions did not differ significantly within PO and GO.

The condition that most resembled prior studies (Levi, 1979; Morris et al., 1982; Nanko, 1981) was the PRNG condition for PO and GO (where random events were initiated by subjects, as was the case in the other studies). PK scores in the PO RNG condition were nonsignificantly above chance and exactly the same (mean score = 5.10) in both the feedback and the nonfeedback modes. However, PK scores in the GO RNG condition were nonsignificantly higher in the nonfeedback mode (mean score = 4.81) than they were in the feedback mode (mean score = 4.73), both nonsignificantly below chance. In the Levi study, PO subjects scored above MCE and higher in the nonfeedback condition than they did in the feedback condition, where they scored below MCE. With GO subjects, the reverse was the case. In the Morris et al. study (which used only a feedback condition), and in Levi's feedback condition, GO subjects scored higher than did PO subjects.

Summary of Predicted Effects

The study provided no direct support for any of the three imagery strategies as a method of increasing PK scores in psi experimentation with a PRNG. Subjects practicing PO did not do significantly better than subjects using GO and EO in the nonfeedback mode of the PK test. The subjects practicing GO and EO did not do significantly better than those using PO in the feedback mode. The new condition, EO, demonstrated overall chance results. Within EO, subjects scored above chance in the nonfeedback condition and significantly higher than they did in the feedback condition, where they scored below chance.

We suggest the following reasons or criticisms: (a) The RNG was not appropriate to the task. Although other studies with PRNGs have obtained significant results (e.g., Jahn & Dunne, 1987; Radin, 1985), prior imagery PK studies used a live source of randomness, and we should have done the same throughout. (b) The strategies simply do not work as a "training" method in this type of .experiment. (c) Psychological factors owing to too many sessions are to blame. Subjects feel more pressure as sessions go on, or they are somehow put off by the prospect of having to do six sessions. (d) The number of subjects was too small. A group size of 144 sessions is probably sufficient when looking at some effects in the data. When the data are broken down to analyze the interplay of various effects, a larger sample of subjects may be required to allow the effects to reach significance.

Before reason could be accepted or justified, it was decided to conduct another experiment to attempt to overcome the criticisms raised in reasons a, c, and d. Furthermore, there were some post hoc trends that when considered in the context of the number of statistical analyses conducted do not yield much information. Another experiment might shed light on which effects were spurious and which were valid.

PSYCHOLOGICAL EXPLORATION

Seven questionnaires will be employed to correlate several traits with their ESP scores. The procedure will include three stages: (a) Personality exploration stage, and (b) imagery, creativity, exploration stage. The following instruments were be used:

Personality dimension stage

Neo Personality Inventory –Revised, NEO-PI-R (Costa and McRae, 1992): This test was designed to provide a general description of normal personality relevant to clinical, counseling and educational situations. Based on the Five-Factor model of personality, the NEO-PI-R is comprised of 243 items; the 240 facet and domain items are rated on a 5-point scale (3 validity items are also included). NEO-PI-R items and materials were designed to be easily read and understood. The five domains (factors) measured by the NEO-PI-R provide a general description of personality, while the facet scales allow for a more detailed analysis. These five factors and their facet scales include Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C). Internal consistency coefficients range from .86 to .95 for domain scales, and from .56 to .90 for facet scales. Stability coefficients ranging from .51 to .83 have been found in three-year, six-year, and seven-year longitudinal studies of the original NEO-PI factors. Some researchers (van Kampen, Bierman, and Wezelman, 1994; Broughton and Alexander, 1995) found positive correlations with psi hitting and the Openness scale was used in psi-ganzfeld studies with significant results, which is interpreted as providing support for conceptualizing the successful participant as flexible, sensitive, and open. In addition, both psi and creativity are characterized by a demand for openness to new and unusual experiences, tolerance for the unrealistic, and both make use of subconscious processing. Both processes are considered to be elusive, intuitive, dissociative and facilitated by altered states (Anderson, 1962, Servadio, 1969; Sondow, 1987). We will use the Spanish version (give citation to be consistent). The test is usually completed within 45 minutes.

TABLE 1

PERSONALITY CHARACTERISTICS MEASURED BY *NEO-PI-R*

	FEMALE (N= 40)		MALE (N= 22)		TOTAL (N= 62)	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
OTICISM (low= 15; high= 142)	**75.14**	**14.23**	**82.46**	**25.58**	**80.22**	**22.87**

xiety (low= 0; high= 28)	14.09	4.84	15.78	5.43	15.26	5.28
stility (low= 6; high= 26)	11.00	3.23	13.46	4.85	12.71	4.54
pression (low= 2; high= 29)	11.55	3.52	13.50	6.06	12.90	5.47
f-consciousness (low= 3; high=	13.36	3.95	13.84	5.53	13.69	5.08
pulsiveness (low= 6; high= 34)	16.14	3.34	16.36	4.78	16.29	4.37
nerability (low= 1; high= 21)	9.00	2.74	11.12	4.36	10.47	4.03
AVERSION (low= 67; high= 154)	**101.91**	**17.08**	**106.28**	**17.13**	**104.94**	**17.12**
rmth (low= 12; high= 29)	19.68	3.84	21.28	4.41	20.79	4.28
egariousness (low= 3; high= 27)	13.64	5.65	15.22	6.08	14.14	5.96
sertiveness (low= 3; high= 30)	16.86	4.96	16.40	5.29	16.54	5.16
ivity (low= 12; high= 27)	17.23	3.58	18.02	3.55	17.78	3.55
citement-seeking (low= 1; high=	14.95	4.21	13.74	4.86	14.11	4.68
sitive emotions (low= 11; high=	19.55	4.09	21.52	4.11	20.92	4.18
NESS (low= 92; high= 55)	**122.68**	**15.85**	**122.96**	**14.67**	**122.88**	**14.93**
ntasy (low= 7; high= 32)	20.95	4.34	20.08	5.59	20.35	5.23
sthetics (low= 11; high= 31)	20.55	5.45	22.44	4.65	21.86	4.95
elings (low= 9; high= 29)	19.86	4.36	20.80	3.86	20.51	4.01
ions (low= 11; high= 26)	17.64	3.60	18.24	3.42	18.06	3.46
as (low= 10; high= 31)	21.50	4.20	19.84	4.56	20.35	4.49
ues (low= 15; high= 29)	21.95	2.62	21.44	3.15	21.60	2.99
EABLENESS (low= 68; high=	**119.64**	**20.09**	**123.46**	**13.44**	**122.29**	**15.72**
st (low= 8; high= 30)	20.09	4.42	19.92	4.76	19.97	4.63
desty (low= 1; high= 29)	18.73	6.21	19.98	5.06	19.60	5.42
mpliance (low= 14; high= 30)	22.68	3.09	23.44	3.36	23.21	3.28
uism (low= 8; high= 28)	18.45	4.06	18.34	4.58	18.37	4.40
aightforwardness (low= 8; high=	18.50	3.73	18.52	3.80	18.51	3.76
nder-mindedness (low= 13; high=	21.95	3.47	22.84	3.06	22.57	3.19
CIENTIOUSNESS (low= 55;	**123.59**	**13.99**	**115.76**	**19.63**	**118.15**	**18.36**

165)						
mpetence (low= 100; high= 27)	21.05	2.93	19.58	3.90	20.03	3.74
f-discipline (low= 3; high= 28)	19.27	4.49	17.08	4.81	17.75	4.80
hievement-striving (low= 12; 31)	21.77	3.81	22.82	3.73	22.50	3.76
tifulness (low= 7; high= 31)	21.73	3.10	20.46	4.33	20.85	4.02
der (low= 5; high= 30)	21.18	2.93	19.16	5.21	19.78	4.70
iberation (low= 4; high= 25)	18.50	4.86	16.86	5.07	17.36	5.03

Millon Index of Personality Styles Revised, MIPS-R (Aiken, 1997; Escovar, 1997; Guevara, & Strack, 1998; Piersma, Ohnishi, Lee, Metcalfe, 2002; Scragg, Bor, & Watts, 1999). This was developed by Dr. Millon in 1994 and revised in 2003. The MIPS Revised test reflects a strong theoretical basis. It is a brief, well-rounded personality measure for adults presenting as normal. The test has 180 true/false items, can be completed in less than 30 minutes on the average. The MIPS Revised instrument addresses three key dimensions of normal personalities: (a) Motivating styles, which helps to assess the person's emotional style in dealing with his/her environment; (b) Thinking styles, which helps to examine the person's mode of cognitive processing; and (c) Behaving styles, which helps to assess the person's way of interrelating with others. A standarized Spanish version of the *MIPS-R* will be used (Castro Solano, 2000; Casullo & Castro Solano, 2000).

TABLE 2

PERSONALITY CHARACTERISTICS MEASURED BY *MIPS-R*

	FEMALE (N= 40)		MALE (N= 22)		TOTAL (N= 62)	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
1. Motivating styles	2.71	2.49	4.15	2.35	3.71	2.46
2. Thinking styles	2.19	2.20	2.71	2.26	2.55	2.24
3. Behaving styles	5.00	1.41	5.71	1.16	5.49	1.27

The Myers-Briggs Type Indicator, *MBTI* (Myers, 1962) is a measure of personality style based on Jung's theory of personality. In this study, Form G was used. The four continuums are Introversion-Extroversion, Intuiting-Sensing, Thinking-Feeling and Perceiving-Judging. Subjects rate 32 dichotomous items proportionally out of an allocation of ten. A total score for each of the four dimensions is derived with scores for opposing dimensions summing to eighty. In a review article summarising the use of the Myers-Briggs to 1990, Murray (1990), found that the Myers-Briggs was adequately reliable and valid. Basic attitudes, when combined with the four functions, produce the eight Jungian Types. These eight types can be further differentiated in terms of the auxiliary function. introverted-thinking, extraverted-thinking, introverted-feeling, extraverted-feeling, introverted-sensing, extraverted-sensing, introverted-intuiting, and extraverted-intuiting.

TABLE 3

PERSONALITY CHARACTERISTICS MEASURED BY *MBTI*

	FEMALE (N= 40)		MALE (N= 22)		TOTAL (N= 62)	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
Introversion-Extroversion	24.77	12.67	30.27	13.88	28.62	13.68
Intuiting-Sensing	8.00	3.35	9.14	4.32	8.79	4.06
Thinking-Feeling	7.14	4.97	7.88	4.54	7.66	4.65
Perceiving-Judging	5.05	4.38	6.49	4.14	6.05	4.23

Imagery and creativity dimension stage

Betts's Vividness of Imagery Scale, BQMI (Richardson, 1969). Mental imagery refers to all the quasi-perceptual experiences in the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts, and that may be expected to have different consequences from their sensory or perceptual counterparts. BQMI is a self-report scale, which contains 35 short descriptions, from which subjects must try to image, and correspond to seven different sensory modalities: visual (i.e. "the sun as it is sinking below the horizon"), auditory (i.e. "the mewing of a cat"), cutaneous (i.e. "the feel of sand"), kinetic (i.e. "reaching up to a high shelf'), gustatory (i.e. "taste of oranges"), olfactory (i.e. "the smell of new leather") and organic (i.e. "the feeling of a sore throat"). The vividness of each of these will be rated on a scale from 1 (maximum) to 7 (minimum). A Spanish version of the scale will be used (give citation for consistency). Results of many experiments involving imagery-enhancing states of consciousness suggest the importance of imagery vividness to the manifestation of psi. It has also been used for the measuring of imagery vividness in many psi tests (Palmer and Vassar, 1974; Palmer and Lieberman, 1975; Honorton, Tierney, and Torres, 1974; Pleshett, 1975; Schechter, Solfvin, and McCollum, 1975; Honorton, 1975; Sargent, 1978). The test is usuallycompleted within 10 minutes.

	FEMALE (N= 40)		MALE (N= 22)	
	Mean	*SD*	*Mean*	*SD*
Imagery Open Eyes	38,79	16,50	38,17	14,87
Imagery Close Eyes	38,54	16,08	38,83	16,85
Imagery Total	38,66	15,26	38,50	14,39

Eysenck Personality Questionnaire, Form A: EPQ-A is a 94-item self-report inventory. Each item of this scale requires a 'yes' or 'not' response. It measures three personality factors: Neuroticism (N), Extraversion (E), and Psychoticism (P). The fourth one is Lie scale (L), which can be taken as a personality variable or "social desireability." Receivers with high N scores indicate high emotional lability. Receivers with high E scores are usually expansive, impulsive and uninhibited. Subjects with low E, the other pole (Introversion), are described as quiet, shy, and introspective, they show themselves as reserved and distant. Crossing low and high scores of Neuroticism and Extraversion, four personality profiles, Phlegmatic (N low and E low scores), Melancholic (N high and E low scores), Choleric (E and N high scores) and Sanguine (E high and N low scores), could be obtained.

TABLE 6

PERSONALITY CHARACTERISTICS MEASURED BY EYSENCK PERSONALITY QUESTIONNAIRE

	FEMALE (N= 40)		MALE (N= 22)		TOTAL (N= 62)	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
Neuroticism (low= 1; high= 24)	8.32	4.85	12.78	5.61	11.44	5.74
Extraversion (low= 3; high= 19)	9.50	4.38	11.61	3.87	10.97	4.12
Psychoticism (low= 0; high= 7)	2.41	1.76	2.69	2.11	2.60	5.74

PK SCORES AND PERSONALITY VARIABLES

We were particularly interested in testing for a possible positive difference between PK scores (PK hitters) and control (no PK hitters) and Openness to Experience (OE), as measured by the above mentioned scale (NEOPIR). OE has been considered to contain "active imagination, aesthetic sensitivity, attentiveness to inner feelings, preference for variety, intellectual curiosity and independence of judgement" (Costa and McRae, 1992, p. 15). Individuals high on OE "are curious about both inner and outer worlds, and their lives are experientially richer. They are willing to entertain novel ideas and unconventional values, and they experience both positive and negative emotions more keerdy than do closed individuals" (Costa and MacRae, 1992, p. 15). Palmer (1996) also found a significant positive correlation between and a different measure of psi experience. Broughton and Alexander (1997) found a weak positive relationship between facet Activity and PK scores is in line with the study of Van Kampen (1994) who found that this facet discriminated between PK hitters and PK missers. Van Kampen et al. also found that Openness facet was the best discriminator for hitting and missing. Zingrone, Alvarado and Dalton (1998-99) confirmed that a number of PK scores correlated positively to the Openness factor and to the Fantasy facet of the NEO-PI-R. They also found a negative correlation with the Order facet of the Conscientiousness factor suggesting that incidence of psi experiences may be associated to a low level of Order in the experiencers.

“Extrovert” and “iNntuitive” types are more prone to paranormal/anomalous experiences, as measured by the MBTI and , are keenly aware of external energies, are likely to reach beyond the five senses, are more receptive to current circumstances, regardless of whether the situation seemed logical or not, and welcome new experiences. In order to avoid any confussion about whether we are using categorial or continious analysis, we chose the continuous rather than categorial scoring. We decided make an one-way ANOVA with the MBTI and scores and PK scores (PK hitters) as dependent variable.

Results

The sample included 62 participants, both 40 females (71.4%) and 22 males (28.6%), their ages ranged from 19 to 77 years (Mean= 48.47; SD= 11.02). Most of this work was conceived as frankly exploratory, designed to uncover possible relationships to test in other experimental databases.

Table 7 gives a ttest for the scores on the personality factors of two groups: HPKS (participants who ranked Highest PK Scores [HPKS] N= 16, 34.7%) and no PK hitters (“control”, that is, participants who didn´t ranked highest PK scores N= 46, 65.3%).

TABLE 7: COMPARISION BETWEEN HIGHEST PK SCORES (HPKS) AND CONTROL OF THE FIVE NEO-PI-R FACETS

NEO-PI-R	***Group****	***Mean***	***SD***	***t***	***p***
NEUROTICISM	**Control**	**80,47**	**22,37**	**-,40**	**,68**
	HPKS	**82,58**	**23,18**		
Anxiety	Control	14,74	5,42	1,06	,29

	HPKS	16,00	5,01		
Hostility	Control	12,56	5,43	-,31	,75
	HPKS	12,95	5,55		
Depression	Control	11,88	5,54	-,71	,47
	HPKS	12,79	5,56		
Self-consciousness	Control	13,94	4,41	-,29	,76
	HPKS	14,26	4,84		
Impulsiveness	Control	16,35	4,67	,07	,94
	HPKS	16,28	4,46		
Vulnerability	Control	10,71	3,98	-,10	,91
	HPKS	10,81	4,85		
EXTRAVERSION	Control	**108,65**	**13,96**	**,43**	**,66**
	HPKS	**106,98**	**18,69**		
Warmth	Control	21,85	4,15	,78	,43
	HPKS	21,02	4,98		
Gregariousness	Control	15,47	4,86	,70	,48
	HPKS	14,58	5,93		
Assertiveness	Control	15,85	3,66	-,81	,41
	HPKS	16,67	4,91		
Activity	Control	19,12	3,80	,83	,40
	HPKS	18,35	4,15		
Excitement-seeking	Control	15,21	4,16	,34	,72
	HPKS	14,81	5,42		
Positive emotions	Control	21,35	4,65	-,30	,76
	HPKS	21,67	4,51		
OPENNESS	Control	**125,21**	**20,98**	**,52**	**,60**
	HPKS	**123,02**	**15,75**		
Fantasy	Control	21,50	5,14	1,06	,29
	HPKS	20,12	6,05		
Aesthetics	Control	23,21	4,33	,47	,63
	HPKS	22,70	4,91		
Feelings	Control	21,76	3,30	1,20	,23
	HPKS	20,72	4,12		
Actions	Control	18,68	3,16	,84	,40

	HPKS	18,02	3,52		
Ideas	Control	21,15	4,62	1,05	,29
	HPKS	19,98	4,98		
Values	Control	21,68	2,94	-,06	,95
	HPKS	21,72	3,34		
AGREEABLENESS	Control	**123,79**	**17,65**	**,04**	**,96**
	HPKS	**123,65**	**13,94**		
Trust	Control	19,91	4,52	,22	,82
	HPKS	19,67	4,72		
Modesty	Control	19,35	4,55	-,27	,78
	HPKS	19,65	4,79		
Compliance	Control	23,00	3,87	-,71	,47
	HPKS	23,60	3,52		
Altruism	Control	19,18	5,12	,30	,76
	HPKS	18,81	5,36		
Straightforwardness	Control	19,03	3,36	,84	,40
	HPKS	18,33	3,82		
Tender mindedness	Control	23,24	3,43	-,41	,68
	HPKS	23,53	2,95		
CONSCIENTIOUSNESS	Control	**117,32**	**17,64**	**,16**	**,87**
	HPKS	**116,67**	**17,57**		
Competence	Control	19,65	3,62	-,60	,54
	HPKS	20,14	3,45		
Self-discipline	Control	17,24	4,00	-,52	,60
	HPKS	17,74	4,46		
Achievement striving	Control	22,50	3,94	-,11	,90
	HPKS	22,60	3,83		
Dutifulness	Control	21,06	4,24	-,23	,81
	HPKS	21,30	4,57		
Order	Control	19,71	5,00	,24	,80
	HPKS	19,42	5,15		
Deliberation	Control	17,44	4,11	,50	,61
	HPKS	16,86	5,56		

* HPKS N= 16; Control N= 46

Table 8 gives a ttest for the scores on the MBTI and MIPS subscales of two groups: HPKS (participants who ranked Highest PK Scores [HPKS] N= 16, 34.7%) and no PK hitters ("control", that is, participants who didn´t ranked highest PK scores N= 46, 65.3%).

TABLE 8: COMPARISION BETWEEN HIGHEST PK SCORES (HPKS) AND CONTROL OF THE MBTI AND MIPS SUBSCALES

Personality Measures	*Frequency*	*N*	*Mean*	*SD*	*F*	*Sig.*
	Control	84	97.93	21.062		
MBTI – Extrovert/Introvert	HPKS	18	103.11	20.562	.876	.419
	Control	84	107.07	20.399		
MBTI – SeNsing/Intuitive	HPKS	18	93.22	18.367	3.844	.024
	Control	84	26.93	7.721		
MIPS – Extravert	HPKS	18	29.94	6.273	1.473	.233
	Control	84	10.76	8.002		
MIPS – Introvert	HPKS	18	7.72	6.008	2.468	.089
	Control	84	15.50	6.210		
MIPS – Sensing	HPKS	18	12.61	5.922	3.159	.046
	Control	84	27.26	7.456		
MIPS – Intuitive	HPKS	18	30.44	8.133	2.628	.076

* HPKS N= 16; Control N= 46

Table 9 gives a ttest for the scores on the imagery scores (Open/Close eyes) of two groups: HPKS (participants who ranked Highest PK Scores [HPKS] N= 16, 34.7%) and no PK ("control", that is, participants who didn´t ranked highest PK scores N= 46, 65.3%).

TABLE 9: COMPARISION BETWEEN HIGHEST PK SCORES (HPKS) AND CONTROL OF THE IMAGERY SCORES

Betts scale	*Group**	*Mean*	*SD*	*t*	*p*
Open Eyes	Control	80.47	22.37	.40	.002
	HPKS	84.58	23.18		
Close Eyes	Control	81.12	22.21	32	.76
	HPKS	82.78	23.18		
Total	Control	80.47	22.37	.37	.06

	HPKS	82.34	23.21		

Table 10 gives a ttest for the scores on the imagery scores (Open/Close eyes) of two groups: HPKS participants who ranked Highest PK Scores [HPKS] N= 16, 34.7%) and no PK hitters (“control”, that is, participants who didn´t ranked highest PK scores N= 46, 65.3%).

TABLE 10: COMPARISION BETWEEN HIGHEST PK SCORES (HPKS) AND CONTROL OF THE EPQ-A (NEUROTICISM – EXTRAVERSION) SCORES

EPQ-A	Group*	Mean	SD	*t*	*p*
Neuroticism	Control	12.78	5.61	2.46	.089
	HPKS	11.61	3.87		
Extraversion–Introversion	Control	81.12	22.21	.468	.76
	HPKS	82.78	23.18		
Psychoticism	Control	80.47	22.37	.372	.86
	HPKS	82.34	23.21		

Personality and PK task

An inspection of the comparisions found between Highest PK Scores and personality aspect does not all the trends found in previous work on the relation between psi and personality. In other words, there was no evidence that the NEO-PI-R domains and facets bore any systematic relationship to PK scoring. It is clear that our sample cannot be considered representative because it was selected screened for having experienced parapsychological phenomena and having a positive belief in the existence of ESP/PK and similar phenomena.

Our prediction of a positive significanve between the PK scores and Extraversion was not confirmed. According to Costa and McRae (1992) “extraverts are characterized by positive emotions, surgency, and the tendency to seek out stimulation and the company of others, and they enjoy being with people, and are often perceived as full of energy. They also tend to be enthusiastic, action-oriented individuals.” Probably, people who have more psi experiences or are willing to report them are affectionate, friendly and intimate in terms of their anomalous/paranormal experiences. They usually also have cheerful, optimistic outlooks on life in general. Our prediction of a significative result between PK scores and Openeness to experience was also not confirmed, except the facet Feelings (Openeness), that is openeness to inner feelings and emotions.

The Myers-Briggs Type Indicator and Millon Index of Personality Styles. Our prediction was that HPKS would score higher than non-HPKS for Extraversion on the MBTI, was not supported. As regard Intuition, our prediction was that HPKS would score higher than non- HPKS on the MBTI, however it was supported (Mean Control= 107.07 vs. Mean HPKS= 93.22, p = .024). Our prediction was that HPKS would score higher than non-HPKS for Extraversion on the MIPS, was not supported. As regard Intuition, our prediction was also that HPKS would score higher than non- HPKS on the MIPS, but no significant results was found.

Imagery ability and PK. The differences between visual imagery and HPKS tended to be quite higher, specially on open eyes. This finding appears consistent with previous research (e.g., Diamond and Taft, 1975) found the paranormal beliefs in which positive relationships between imagery and mystical experiences were obtained, and with Irwin´s (1979) results differentiating visual and intuitive imagery. George and Krippner (1984) noted in his review of the literature that many traditions (e.g., shamanic, Buddhist, even popular occult) emphasize the importance of imagery to paranormal experiences. Additionally, investigators of spontaneous cases of individuals reporting paranormal experiences in different cultures (e.g., Green, 1960; Rhine 1981; Sanwald, 1959) have found evidence that imagery (particularly "visual" imagery better than other sensorial modality) often serves as PK-mediating vehicle. These results highlight that, insofar as mental imagery ability helps psi, it is interesting to use the Betts scale for identifying and selecting better psi-scorers in experiments and other experimental designs, such as psychomanteum, aura seeing, ganzfeld research, and other experimental settings. The Betts's advantages stem from its facility of administration and its rapidity of analysis. This studies show that it is judicious to stimulate mental imagery in individuals who participate in PK experiments, for instance by way of mental imagery instructions. The present study focused on vividness of visual imagery. I did not examine the ability of subjects to control imagery.

Eysenck Personality Inventory. There was no evidence that the Extraversion, Neuroticism or Psychoticism domains bore any systematic relationship to PK scoring. It is clear that our sample cannot be considered representative because it was selected screened for having experienced parapsychological phenomena and having a positive belief in the existence of ESP/PK and similar phenomena.

PK IMAGERY RESEARCH: EXPLORATORY STUDY

ABSTRACT. Two studies were done exploring the effectiveness of two PK imagery strategies derived from a survey of popular writings on how to develop psychic skills. Goaloriented imagery involves visualizing only the final outcome or desired goal; processoriented imagery involves visualizing some sort of process gradually leading up to the desired final outcome. In the first study, 62 subjects were asked to bias the behavior of a visual display controlled by a random number generator, using each imagery strategy half the time (8 runs of 16 trials for each strategy). There was significantly positive overall evidence for PK ($p < .02$) and for PK during goaloriented imagery ($p < .01$). If one considers the subject as the unit of analysis, subjects' overall scores differed significantly from chance ($p < .05$); neither imagery strategy produced scores that differed significantly from chance, and goaloriented scores did riot differ significantly from processoriented scores. In a second study, 20 subjects attempted the same PK task, using each imagery strategy half the time. An analysis of variance revealed that goaloriented imagery scores were significantly greater than processoriented scores, that prior training was not itself a significant factor, but that imagery strategy and prior training interacted significantly ($p < .02$). Subjects in this study were asked to practice concentration enhancement exercises and return in two weeks to repeat the PK procedure, this time using their preferred imagery strategy for all 16 runs. Eight subjects chose the goaloriented strategy; their scores were significantly above chance ($p < .01$). Eleven subjects chose the processoriented strategy; their results were at chance. The difference between the two groups was significant ($p < .02$). Thus the goaloriented imagery strategy appears to be more effective than the processoriented Strategy, at least for those with no prior exposure to mental development training. In the second study, we investigate the effects of two psychologically distinct techniques of attempting to influence falling dice. In the first technique ("conscious concentration"), the subject was requested to attempt, by consciously focusing his willpower and inducing a tension in his muscles, to force the dice to fall with the target face upward. In the second technique ("visualization"), the subject was asked merely to visualize the desired face while in a state of relaxation. Marginally significant evidence of psimissing was obtained in the conscious concentration condition ($p < .04$), but chance results under the visualization condition. The difference in scoring rate between the two conditions was significant at the .05 level.

Introduction

There are many studies that have explored methods that might enhance the operation of psychokinesis. The studies are divided into six main categories: (a) hypnosis, (b) yoga and meditation, (c) relaxation, (d) feedback, (e) negative reinforcement and punishment, and (f) visual imagery. A distinction is made between training studies and studies conducted to explore the effectiveness of certain methods. Most of the studies investigated methods that might facilitate the operation of PK on a single occasion. The designs of the studies are described, and their results are presented and discussed. Several improvements and suggestions are considered for future research into methods of enhancing and potentially training PK.

A large body of controlled studies is available on possible ESPconducive methods in the experimental environment. (See Honorton, 1977b, for a review of yoga and meditation work; see Honorton, 1985, and Stanford, 1984, for Ganzfeld work; see Honorton & Krippner, 1969, and Schechter, 1984, for hypnoticinduction work; see George & Krippner, 1984, for mental imagery work; see Honorton, 1977b, and Mishlove, 1983/1988, for relaxation work; see Palmer, 1978, 1986, for feedback training work.) However, less attention has been paid to potentially PKconducive methods. This chapter surveys studies that have explored methods to facilitate PK. Research in this area may eventually enable us to bring PK phenomena to such a level that they may become more reproducible on demand and therefore more readily available to scrutiny.

The solutions to many problems facing parapsychology, such as building and testing theories, depends on the researchers having a reliable procedure to generate measurable psi. Not enough reliable highscoring participants turn up in experiments, and those who do are liable to lose their ability to score highly after a period of time (Thouless, 1964, p71). John Beloff (1967) states: "Progress is possible in science only when the relevant phenomena are available for research" (p.120). Gardner Murphy (1969, p.3) wrote that the problem of cultivating "good psychic participants" was really the beginning and the center of all Psychical research. According to Murphy, the cultivation of the "paranormal gift" (p. 10) was similar to the cultivation of almost any other kind of gift –whether playing the piano or learning to wiggle one's ears.

The assumptions behind the studies in this review are that "trainable" PK ability may exist, and that this ability can possibly be brought to such a level through practice that it becomes amenable to systematic research. It is possible to distinguish between a training study and a study conducted to explore the effectiveness of a certain method. The term "training" denotes, generally, the process of bringing an organism's performance, such as making specific response(s) or engaging in complex skilled activity, to a previously agreed upon improved end state of proficiency by a specific instructional program or structured manner of practice. The experiments cited here were not necessarily aimed at training PK. Most of them explored methods that might facilitate the operation of PK on a single occasion. Strictly speaking, a training study would involve repeated sessions and emphasize a process with actual training goals in mind.

The studies of potential PKfacilitating methods have been broken down into six main categories: (a) hypnosis, (b) yoga and meditation, (c) relaxation, (d) feedback, (e) negative reinforcement and punishment, and (f) visual imagery. These particular methods were selected because, if they can be shown experimentally to be PKconducive, they could be used without too much difficulty in a specific instructional program aimed at bringing participants' PK performance to a high and consistent scoring level. It should be noted that each method does not necessarily demand a facility specific to a given form of psi. In fact, the faculties called upon to perform each method do not appear to be independent; most methods explicitly or implicitly call for one or more of the others (e.g., meditation probably involves relaxation to some degree).

In the experimental literature, very little attention has been paid to the role of specific volitional activitiesthe mentation involved in intending, wishing, willing, wanting the target to behave in accordance with the instructions. The only systematic exploration of volitional activities has consisted of a few studies conducted to explore the effect of visualimagery strategies on PK performance. These studies have mainly examined two strategies: goaloriented imagery, which is a visualization of a desired goal or outcome of a PK trial; and processoriented imagery, which is a visualization of a process leading to a desired goal or outcome of a PK trial.

There are six studies on record that can be considered to have explored the role of goaloriented imagery in the generation of PK (Levi, 1979; Morris & Reilly, 1980; Morris, Nanko, & Phillips, 1982; Nanko, 1981; Stanford, 1981; Steilberg, 1975). All six studies yielded PK scores in the positive direction for goaloriented imagery. The PK scores were significantly above chance in three of the six studies when trialbytrial feedback of performance was provided (as an experimental variable in Levi, 1979, but as the essential experimental design in the studies by Morris et al., 1982, and Nanko, 1981).

Two experiments were carried out at the parapsychology laboratory at the Instituto de Psicología Paranormal to attempt to replicate these findings and to explore the possibility of using volitional imagery strategies as a method of enhancing PK scoring from session to session. PK success will be measured by an RNGbased computer test which it was designed for one of us.

Psi research on unselected subjects appears to produce sporadic results, too inconsistent at present to allow development of an effective processoriented research program. Although research with "gifted" individuals can produce impressive results, they seem limited in their generalizability and often dependent upon the unique interpersonal dynamics of the research team involved. For a variety of reasons (Child, Honorton, Kelly, Morris, & Stanford, 1980) we have therefore chosen to focus on techniques for training individuals to develop and maintain psychic functioning.

General Aims

To this end, we have conducted a preliminary survey of the popular literature by over fifty authors on such techniques. The present study is an attempt to explore two different visual imagery strategies that this literature advocated for the intentional production of PK phenomena. Thus, our strategy for exploring the nature of PK involves:

(a) focusing on volitional variables, especially those already mentioned within the literature;

(b) deploying those variables within a "training" context by providing participants with exercises drawn from the training literature;

(c) collecting considerable individualdifferences data; and

(d) varying conditions of theoretical importance for the assessment of the role of volition in a standard PK testing procedure.

First exploratory study

The importance of psi training research lies in attempting to find means of producing measurable psi. However, in order to be able to establish a psi training procedure, it can be argued, we need to know more about how psi can be controlled. We may want to investigate whether:

1. Use of this mental procedure results in increasingly strong and stable psi scores with continuous practice, and

2. Participants will be successful because they practiced the mental procedure, or this technique merely served to trigger some latent natural abilities, or simply boosted their motivation, confidence, and so forth, are other questions that have to be answered by yet further research.

If we are to evaluate the traditional idea of PK as a volitional effort that in itself contributes causally to target outcomes, then we must focus attention in part on those volitional acts themselves, and we must go beyond merely varying the nature of the assigned volitional task. If differences in the realtime volitional activities do seem to matter, if there is some evidence that certain assigned volitional strategies or styles seem to produce better results than others, then (a) it supports the hypothesis that those volitional activities are themselves causally involved after all in some way, and (b) it contributes to a more effective experimental protocol for producing positive results.

Thus, one aim of the present study is to extend earlier research suggesting that some assigned volitional strategies seem to work better than others. Thus, our strategy for exploring the nature of PK involves:

(a) focusing on volitional variables, especially those already mentioned within the literature;

(b) deploying those variables within a "training" context by providing participants with exercises drawn from the training literature;

(d) varying conditions of theoretical importance for the assessment of the role of volition in a standard PK testing procedure.

Results

Since this study was designed as a pilot study, we asked several descriptive questions of the data. The random event generator produced decisions in accordance with the subject's instructions (hits) 51.9% of the time ($z = 2.38$, $p < .02$, twotailed).

Almost all of the positive scoring occurred with the goaloriented imagery, which produced 52.9% hits and was independently significant ($z = 2.6\ 1$, $p < .\ 0\ 1$, twotailed). The Z score (or critical ratio) has been used traditionally to assess whether or not an overall extrachance effect is taking place; it is a general statistical test in that it does not discriminate between strong effects manifested by a few individuals vs. weak effects by many individuals.

An abovechance but nonsignificant overall scoring rate would yield a significant t statistic if all subject scores were at or near the average, while a significant overall rate could be nonsignificant by the t procedure if obtained by averaging a few very high subject scores with other scores that were at or below chance. The mean deviation from chance of the total scores for all subjects was + 4.75; this deviation was statistically significant at $p < .05$, twotailed ($t = 2.36$, with 15 df).

The mean deviation from chance of the goaloriented imagery PK scores was +3.69; this deviation was not significantly different from chance ($t = 1.84$, with 15 df, $p < .10$, twotailed). The mean deviation from chance of the processoriented imagery PK scores was + 1.06; this deviation was riot significantly different from chance ($t = .99$, 15 df, $p < .40$, twotailed). The difference in number of hits per session per condition between the two procedures was not significant ($t = .872$, $< p < .40$, twotailed).

"CONSCIOUS CONCENTRATION" VERSUS "VISUALIZATION" IN PK TESTS

Aims

The purpose of this investigation was to repeat the American experiments aimed at having the subject consciously influence the results of dicethrowing in such a way that a certain dieface, selected beforehand as the target, would come up more often than could be expected by chance alone. Apart from the principal aim of the experiment (the demonstration of a PK influence on rolling dice) it was expected that the subjects would show a differential effect in their scoring; i.e., that they would score positively during one of two psychological conditions and negatively in the other.

Briefly, in one condition, the subject was to try to concentrate on the target face of the die; in the other, he was to try to visualize it. Of the secondary analyses that were planned, one was a comparison of scoring by males and females. Others were a comparison based on expansioncompression in drawings tests, and one based on preferred versus nonpreferred diefaces.

Results

The overall results gave a nonsignificant deviation of 43 in the total of 1,440 runs (34,560 trials). The results of the two psychological conditions were as follows. In the conscious concentration condition there was a deviation of 109 hits (CR = 2.22; p = .04). The 720 runs in the visualization condition resulted in a nonsignificant deviation of +66 hits. The difference in scoring rate between the two conditions was significant by the Wilcoxon test at the level of p = .05 (N = 10).

Neither the total results nor the results of the two conditions separately showed any significant differences between males and females, expansiveness and compressiveness in the subjects' drawings, nor preferred vs. nonpreferred diefaces or combinations of die faces. The overall results produced a chronological effect when the first of the subject's three series were compared with the last of the three. This effect was in the form of an incline of 151 hits from Series I to Series 3, which was marginally significant by the Wilcoxon test (N = 9; T = 4.5; P = .03). This finding must be considered to be a post hoc result, however, since a number of other analyses for possible position effects were performed on the data.

Discussion

Before considering possible interpretations of the results, some alternative hypotheses for the observed PK effects should be considered. It is possible, for instance, to advance the hypothesis that the effects were due solely to chance, excluding a parapsychological influence. The negative deviation obtained in Condition 1 and the differential scoring between the conditions indicate that the various effects are unlikely to be due to chance alone. Another counterhypothesis to psi is the possibility that the apparatus was biased in a certain direction. As to this possibility, the reader is referred to the investigation by Albers (1973). The same apparatus was used in his experiments. Furthermore, control tests were conducted that gave evidence that the apparatus was without any noticeable bias. In order to eliminate any possible bias of the dice, it was decided beforehand that in every test series an equal number of throws (96 trials) would be devoted to each target number. The sequence of the target numbers to be used in the course of the series was fixed in a random manner.

Another explanation of the results could be the selection of data. Such an explanation, however, cannot be applied to the present experiment because it was decided beforehand that attention would be given to deviations from chance and to differential effects between the two psychological conditions. Since the results were suggestive of a psimissing effect in Condition differential effect between the two conditions, and an overall incline between the two conditions, it may be assumed that with the use of our apparatus and experimental setup, a parapsychological influence seems to have been exerted on the rolling dice.

But then, what could be the explanation of the observed negative deviation in Condition I and the differential effect between the two psychological conditions? The subjects stated after the tests that they expected more success in Condition I because of the possibility of making more use of their willpower. On the other hand, they indicated that they liked Condition 2 much more because of the quiet, relaxed state in which they were tested. Maybe in this case the tense concentration had a disturbing influence on the psi activation.

But this is in contrast with the findings of Honorton and Barksdale (1972). In their experiments, using an electronic binary random generator, they found a significant difference between muscle tension and relaxation conditions in which the runs following muscletension suggestions had independently significant abovechance scores. Also, a study with one subject yielded a significant positive deviation in the muscletension condition and a significant negative deviation in the relaxation condition. This study, of course, is not completely comparable with the present one because of different design, apparatus, and so on. However, it is an interesting fact that subjects in their study obtained higher scores following passive concentration instructions (no conscious effort directed toward the target) than following active concentration instructions (consciously trying to exert effort on the target). This effect goes in the direction of that found between our "relaxation" and "concentration" conditions.

In contradiction to the findings of the abovementioned PK experiments, the ESP experiments reported show a rather consistent picture. W. G. Braud and L. W. Braud (1973) have reported significant performances on a freeresponse ESP task after the subjects had undergone a procedure combining progressive muscular relaxation, suggestions of mental and physical relaxation, and suggestions that the induced state of relaxation was optimal for ESP. In a recent study Braud and Braud (1974) explored the role of muscular relaxation versus tension as a facilitator of GESP and obtained significant results for the subjects in the relaxation group, subjects in the tension group scored at chance. The overall outcome of the study by Stanford and Mayer (1974) confirms the Braud work. Here too the fact that there was a positive relationship between ESP performance and mental stillness and quietude at the beginning of the relaxation procedure suggests that psychological relaxation plays an important role in the use of ESP in freeresponse tasks.

Such consistent results have not yet been found in the exploration of PKconducive states. Maybe a more profound focusing on the preference of the subjects for several conditions, their mental and physical state at the start of the experiment, will give more information about the process of psi activation.

Future research projects will exam:

1. The personality structure of the subjects, their motivation, taskorientation, and so on may give important cues about this question. One may say that all the components in the setting (experimenter, observers, situation, and recording) may have an influence on the psychological state of the subject. To eliminate a great part of these variables (or to keep them under control) is a difficult and complicated task.

2. The results of the present study can be a moderate base for continuing research in this direction, focusing on specific variables.

The significant departures from chance observed in the present studies appear to constitute good additional evidence for a PK effect. The results cannot easily be interpreted as due to a first-order bias in the source of randomness. In the present study, the RNG generated clockwise decisions 50.398% of the time, a nonsignificant departure from chance ($.40 > p > .30$). Additionally, since target direction was completely counterbalanced within each condition within each subject, any bias in the RNG would cancel out and not contribute to the results. If there were a first-order bias of great size, it might inflate the variance of scores between subjects and/or conditions; in the present study, we obviously need not be concerned about this possibility.

Subject fraud also appears unlikely. Subjects were not provided with information about the actual workings or circuitry of the machine. Although subjects were left alone with part of the apparatus, they could not affect the tallies on the trial or hit counters by any actions upon that part of the apparatus. Target generation and scoring both occurred through specific circuitry in the main console, independent of interaction with the subject's console. At the start of each run the subject would set the target generation and tallying process in motion by a button-press, but once that initial press took place no further actions (e.g., additional rapid button- pressing, disconnecting the console, etc.) had any effect upon the generation and tallying process.

Experimenter-biased recording errors also appear unlikely. As explained above, Experimenter 1 was always unaware of target direction when recording the tally of clockwise steps and thus had no direct knowledge of whether or not a high score or a low score was desirable for any given run. All other steps in deriving a hit count for each subject were double-checked at least twice by two more people.

The major additional finding of the present study is the scoring difference between goal-oriented and process-oriented imagery strategies, and the suggestive evidence that this difference is strongest for those who have had little prior exposure to mental development training. The finding occurs both within and between subjects; however, all subjects were initially exposed to both strategies. Mle cannot generalize at this time to subjects who may be exposed initially only to one of the two strategies; a follow-up study using the latter design is necessary to assess whether our findings are in part produced by, a differential effect (see Stanford, 1969, for a discussion of differential effects in comparing mental strategies on a PK task using within-subject designs).

It is possible that the differential was also produced in part by an experimenter effect. Although Experimenter 1 was hopeful that each of the two strategies would produce good results, he personally preferred the goal-oriented strategy when informally working with the apparatus himself. Perhaps his interactions with subjects conveyed his own preference and they responded accordingly.

One problem with any interpretation of the results which posits a subject preference for goal over process is that when subjects were allowed to choose which strategy they would use, more chose the process strategy. Since these subjects had all been students of Experimenter 2, we were able to interview some of them about their reasons for choosing the process strategy even though the first time around the goal strategy had in fact worked best for them. Their comments indicated that they chose the process-oriented strategy either because it somehow seemed logically the one most likely to succeed or because it seemed more interesting or because (in two cases) they had seen more deviation from randomness with it the first time and were thus more confident that it could produce an effect of some sort.

Although for some subjects their initial failure with the processoriented response may have involved preference of goal over process, it seems more likely that for others the attempt to employ the process-oriented strategy may well have led to an internal state that is not as psi-conducive. Perhaps the increased complexity of the process strategy may have provoked more a feeling of conscious striving, whereas the goal-oriented strategy may have allowed easier adoption for some of a passive volitional strategy. Stanford (1977) summarizes evidence suggesting that the latter seems preferable for success in PK tasks. Whatever the answer, much further research is needed, with more descriptive data taken from individuals about what strategies they have used and how they have employed them.

Generalization of these results to other displays, other testing environments, and other subject populations must in general await further research and further refinement of ways of helping subjects describe their own internal processes without inducing excessive introspection. The present study should serve primarily to indicate a promising line of research that hopefully will become useful in working with participants in PK training procedures.

"FEEDBACK" VERSUS "NONFEEDBACK" IN PK TESTS

We determine whether sufficiently impressive PK results can obtain under conditions in which volunteers receive no immediate, trial-by-trial feedback, and in addition determine whether promising results continue while volunteers are at locations remote from the random event generator (REG) used to assess PK.

In Experiment 1, a within-subjects design is employed. A volunteer attempts several runs of PK on a Schmidt REG, some with and some without concurrent trial-by-trial sensory feedback. In this instance, immediate visual feedback is provided by the direction of "movement" of illuminated lamps in a circular, "clock-face" array. For the nonfeedback condition, the visual display is disengaged and neither the volunteer nor the experimenter receives trialby-trial feedback. The experimenter receives delayed, gross feedback at the end of each run as he records scores from the REG's electromechanical counters. The volunteer receives delayed, gross feedback at the very end of the experiment when he or she is informed of the number of "successful" runs (those in which hit scores are greater than miss scores).

Experiment 1: Method

The apparatus consisted of a Schmidt binary random event generator (REG). Internal circuitry allowed trials to be programmed at a rate of one trial per second. A run was automatically terminated after a preset number of trials. The REG was attached to a visual feedback display consisting of 12 small lamps in a circular "clock-face" array. The REG's binary "decisions" (hits and misses) were automatically recorded on punched paper tape by a device housed in a sound-attenuating enclosure in another room. The apparatus has been described fully by Schmidt. The circular lights arrangement seemed a psychologically optimal one since the visual feedback was binary, yet variable enough to maintain attention.

When the volunteer arrived at the laboratory, the experimenter (W. G. B.) interacted socially with him or her for a few minutes in his office, then escorted the volunteer to the experimental room where he descr ibed the work of the Foundation in general and the present experiment in particular. The experiment was introduced as the first of a series of three experiments. The volunteer was told that he or she' could participate in one, two, or all three of the phases of the series, as preferred.

The volunteer sat in a comfortable desk chair approximately 30 cm. from the REG as W. G. B. explained the operating principles of the REG and demonstrated its action for 16 trials in the feedback mode. The volunteer was told that feedback runs would alternate with nonfeedback runs. During feedback runs, the volunteer was instructed to watch the "clock lights" display while intending for the lights to "move" always in a clockwise direction. It was suggested that the volunteer "wish" for the light to move appropriately, imagine it moving properly, attend to it strongly when it moved correctly, and ignore its incorrect moves. No mention of "effort" was ever made. During nonfeedback runs, the volunteer was instructed to attend to the darkened display while imagining a light moving from bulb to bulb always in a clockwise direction and at the same rate as in the feedback runs.

The experimenter explained that both the volunteer and the experimenter would listen to loud white noise during each run (a) to eliminate distracting environmental sounds, (b) to prevent hearing of any auditory feedback provided by the operation of the electromechanical counters of the REG, and (c) because the acoustic. The experimenter then attached his own and the volunteer's headphones and started the REG for the first run. The REG stopped automatically at the conclusion of each 256-trial run. Feedback and nonfeedback runs were alternated according to an ABBA or BAAB counterbalanced design (to control for any time-dependent effects), with the nature of the first run being determined by a coin toss accomplished immediately before the first run. The clock-lights display was inactivated and the counters of the REG were covered with an opaque card (to prevent visual feedback) during nonfeedback trials. The experimenter and the volunteer removed their headphones between runs to minimize sensory adaptation to the white noise. The inter-run interval was 30 seconds. At the conclusion of each run, the experimenter notified the volunteer (by means of a prearranged signal) that the run was over and recorded the hit (clockwise moves) and miss (counterclockwise moves) scores from the counters. Each volunteer completed 12 runs of 256 trials each six with and six without immediate visual feedback.

Throughout the session, the experimenter sat next to the volunteer and the REG and allowed his mind to be as blank as possible. He attempted to allow his sole thought about the experiment to be: "may this experiment yield useful results. At the very end of the session, gross delayed feedback was provided the volunteer in the form of information about the number of successful runs (hit score greater than miss score) out of a possible.

Results

Single mean t tests were used to compare the number of hits (clockwise moves) with mean chance expectation, separately for feedback and nonfeedback trials. The mean number of hits for the feedback condition did not differ significantly from chance (X= 771.8, $t = .056$, $df = 9$, p = n.s.). The mean number of hits for the nonfeedback condition was significantly greater than chance (X= 784.1, $t = 2.70$, $df = 9$, $p < 05$, two-tailed). Hit scores for the two conditions did not differ significantly from each other, as assessed by a paired t test ($t = 1.64$, $df = 9$, $p < .20$, two-tailed).

Experiment 2: Method

Since significant PK hitting occurred under the nonfeedback condition of Experiment 1, a second experiment was designed in which the absence of feedback was enforced even more strictly. Several procedural changes were made in Experiment 2. All trials were run without feedback, the volunteer reclined throughout the session in a comfortable reclining chair, a "passive volition" or "effortless intention" attitude toward the PK task was encouraged, the actual PK trials were preceded by tape-recorded exercises for progressive muscular relaxation, autogenic phrases, suggestions for mental stillness and quietude, and suggestions for success at the PK task, and the experimenter attempted to remove himself and his influence from the experiment as much as possible.

The apparatus was identical to that described in Experiment 1. After greeting the volunteers and chatting socially with them, the experimenter (AP) escorted the volunteer into the experimental room and asked him or her to sit in the recliner. The proposed series of experiments (PK without feedback) was explained and the volunteer was informed that he or she would be participating in the first phase of this series.

The REG was demonstrated as in Experiment 1. Next, the purpose of the tape recorded exercises was explained and each exercise was described briefly. The "passive volition" attitude was explained. When the experimenter was certain that the volunteer understood the nature of the experiment, he placed headphones over the volunteer's ears, reclined the chair to a 45-degree position, started the instructional tape recorder, started the REG, then left the room, busying himself with other matters until a timer signaled the end of the session.

The instructional tape played for a total of 57 minutes and included the following contents: (a) a two-minute musical introduction, (b) two minutes of introductory comments about PK and the procedures which follow, (c) 17 minutes of progressive muscular relaxation exercises, with alternate tension omitted, (d) six minutes of autogenic exercises, (e) four minutes of suggestions for mental stillness and quietude, (f) two minutes of task-orientation ("effortless intention") instructions, and (g) a 24-minute period of soft white noise, signalling the actual PK period.

The volunteer was asked to allow the REG to generate more "hits" than "misses." For this experiment "hits" we redescribed as events which would advance the right hits counter and move the lights in a clockwise direction (if these were not disengaged) and would be indicated by holes in the hit column of the punched paper tape, a sample of which was shown to the volunteer.

The PK task itself consisted of ten runs of 128 trials each, generated at a rate of one trial per second. There were 20-second rests between runs. During the experiment, neither experimenter nor volunteer received trial-by-trial feedback. The "clock lights" display and the electromechanical counters were disengaged and the REG outputs (hit and miss counts) were recorded remotely on punched paper tape by a device housed in a sound-attenuating enclosure in another room. The punched paper tapes were later scored by another person who counted the holes while unaware of which were hits and which were misses. At the end of the experiment, the scorer gave a list of total counts (of holes in two positions on the tapes) to the experimenter who decoded these numbers into total numbers of hits and misses. Thus, the experimenter received only very gross, delayed feedback. When the experiment had been concluded, the volunteers were notified by telephone about the outcome of the experiment as a whole; not even their individual total scores were revealed to them.

Results

A single mean t test was used to compare the hit scores of these twenty volunteers with mean chance expectation. The scores were significantly greater than chance ($X = 646.95$, $t = 1.89$, $df = 19$, $p < .05$, one-tailed). A one-tailed test was used on the basis of findings for the nonfeedback condition of Experiment 1.

Randomness test trials were accumulated throughout the course of the two experiments in order to determine whether any "side bias" existed in the REG. As recommended by Davis and Akers, for each experiment, the total number of randomness trials collected was four times the number of trials collected in the actual experimental series. Randomness test trials were accumulated before and after the experimental sessions of each of the volunteers. The REG was allowed to run under conditions identical to those of the PK sessions, with two exceptions: volunteers were absent and the experimenter left the room and attempted to busy himself with other matters and not think about the REG, and scores were read directly from the electromechanical counters, rather than from punched paper tape, which was not employed at all.

The randomness test trials collected during Experiment 1 indicated that the REG had no detectable side bias (61, 383 hits, 61, 497 misses, z = -. 32, p = n. s.); nor was there any indication of bias in the 102, 400 randomness trials accumulated during Experiment 2 (51,241 hits, 51, 159 misses, z = 0.26, p = n. s.).

General Discussion

Marginally significant PK effects occurred under the "nonfeedback" conditions of these experiments. These conditions could more accurately be called "limited feedback" conditions. The importance of these findings lies in the suggestion that immediate, trial-by-trial feedback does not appear essential to the occurrence of experimental PK.

Schmidt has already provided evidence, in his "time -displaced" or "retroactive" PK experiments, that feedback need not be immediate for successful PK to occur; in fact, significant PK effects obtained even when feedback to the volunteer was delayed for as long as days or weeks. What the present findings suggest is that feedback need not be of a trial-by-trial nature to be effective. In these experiments, the only feedback received by the volunteers was information about the number of successful runs (in Experiment 1) and information about the outcome of the experiment as a whole (in Experiment 2). The only feedback received by the experimenter was individual run scores (in Experiment 1) and total run scores (in Experiment 2). While immediate, trialby-trial feedback may augment PK performance (as Tart has suggested), it is not necessary for the simple occurrence of PK; gross, delayed feedback seems sufficient for a PK manifestation. This finding is consistent with Cox's "blind PK" results and with the results of several other "nonfeedback" or "limited feedback" studies reviewed by Stanford.

There are reasons to expect that, under certain conditions, the absence of feedback. may actually facilitate PK performance. Especially early in a session or on other occasions when PK phenomena are not yet in evidence, feedback might be discouraging to an individual attempting PK. The discouragement resulting from the conflict between the intention for an event to happen and the perception of the event not happening would be minimized by eliminating feedback and hence knowledge of the event not happening. "Imaginany feedback" (as in the present experiments), in which the volunteer imagines a reality congruent with his intention, would seem psychologically more optimal for success. In fact, several of our volunteers, in Experiment 1, spontaneously commented that the visual feedback seemed to interfere with a PK effect and that PK seemed "easier" when the intended outcome was simply "imagined." Similar views have been expressed by Padfield and by Brookes-Smith. A second consideration that suggests the usefulness of the absence of feedback derives from Stanford's suggestion that "egocentric effort" may disrupt PK performance. It would appear that feedback would increase egocentric involvement in a PK task.

Psi-mediated feedback may be sufficient for the activation and "reinforcement" of psi and PK effects. Please note that by that statement, we are not committing ourselves to a "cybernetic" model of the type iliscussed by Stanford; our position regarding a cybernetic model is identical to Stanford's. We would argue, however, that "feedback" and "contingency" need not be as sensorily-bound as Schmidt and Stanford seem to imply in their theoretical statements.

An unexpected finding remains to be discussed, and that is the absence of a PK effect in the feedback condition of Experiment 1. Such a finding is inconsistent with a substantial body of experimental PK results as well as with the expectations of the experimenters that PK effects would oc - cur in both conditions but would be of greater magnitude in the feedback condition. It should be noted, however, that for the experimenters, the most important outcome of these experiments was that PK be evident in the nonfeedback condition. This finding would be essential if we were to progress to phases 2 and 3 of the planned series. It may well be the case that experimenters obtain the results that are most important to them, but sometimes at a cost.

REFERENCES

Achterberg, J., & Lawlis, G. F. (1979). A canonical analysis of blood chemistry variables related to psychological measures of cancer patients. *Multivariate Experimental Clinical Research. 4, 110.*

Achterberg, J., & Lawlis, G. F. (1984). *Imagery a nd disease, imageCA, image SP, imageDB: A diagnostic toolfor behavioral medicine.* Champaign, Illinois: Institute for Personality and Ability Testing.

Achterberg, J., Lawlis, G. F., Simonton, ., & MatthewsSimonton, S. (1977). Psychological factors and blood chemistries as disease outcome predictors for cancer patients. *Multivariate Experimental Clinical Research,* 3, 107122.

Andrew, K. (1975). Psychokinetic influences on an electromechanical random number generator during evocation of "lefthemispheric" vs. "righthemispheric" functioning [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology 1974 (pp.* 5861). Metuchen, NJ: Scarecrow Press.

Barber, TX (1969). *Hypnosis: A scientific approach.* New York: Van Nostrand Reinhold.

Barber, TX (1976). *Pitfalls in human research: Ten pivotalpoints.* Elmsford, NY: Pergamon Press.

Batcheldor, K.J. (1966). Report on a case of table levitation and associated phenomena. *Journal ofthe Societyfor Psychical Research, 43,* 339356.

Batcheldor, K.J. (1979). PK in sitter groups. *Psychoenergetic Systems, 3,* 7793.

Batcheldor, K.J. (1984a). Contributions to the theory of PK induction from sittergroup work. *Journal of theAmerican Societyfor Psychical Research,* 78,105122.

Batcheldor, K.J. (1984b, April). Recent phenomena at Exeter. *PKMessenger,* No. 4.

Beloff, J. (1967). Can paranormal abilities be learned? *Journal of the American Society for Psychical Research, 61,* 120129.

Beloff, J., & Mandleberg, 1. (1966). An attempted validation of the "Ryzl technique" for training ESP participants. *Journal of the Societyfor Psychical Research, 43,* 229249.

Berger, R. E. (1988). Psi effects without realtime feedback. *Journal of Parapsychology, 52,* 127.

Berger, R. E., Schechter, E. I., & Honorton, C. (1986). A preliminary review *of* performance across three computer psi games. In D. H. Weiner & D. 1. Radin (Eds.), *Research in parapsychology 1985 (pp.* 1 3). Metuchen, NJ: Scarecrow Press.

Brand, C. R., & Deary, I. J. (1982). Intelligence and "Inspection Time." In H. J. Eysenck (Ed.), *A modelfor intelligence (pp.* 133148). Berlin: SpringerVerlag

Brand, L.W, & Braud, WG. (1974). Further studies of relaxation as a psiconducive state. *Journal of the American Societyfor Psychical Research, 68,* 229245.

Brand, L.W, & Brand, WG. (1977). Clairvoyance tests following exposure to a psiconducive tape recording. *Journal ofResearch in Psi Phenomena, 2,* 1021.

Brand, WG., & Brand, L.W (1973). Preliminary explorations of psiconducive states: Progressive muscular relaxation. *Journal ofthe American Society for Psychical Research, 67,* 2646.

Braud, LW, & Brand, WG. (1978). Psychokinetic effects upon a random event generator under conditions of limited feedback to volunteers and experimenter [Summary]. In WG. Roll (Ed.), *Research in parapsychology 1977 (pp.* 135143). Metuchen, NJ: Scarecrow Press.

Braud, L.W, & Braud, WG. (1979). Psychokinetic effects upon a random event generator under conditions of limited feedback to volunteers and experimenter. *Journal of the Society for Psychical Research, 50,* 2132.

Braud, WG. (1975). Psiconducive states. *Journal of Communication, 25,* 142152.

Braud, WG. (1978a). Allobiofeedback: Immediate feedback for a psychokinetic influence upon another persons physiology [Summary]. In WG. Roll (Ed.), *Research in parapsychology 1971' (pp.* 123134). Metuchen, NJ: Scarecrow Press.

Braud, WG. (1978b). Recent investigations of microdynamic psychokinesis, with special emphasis on the roles of feedback, effort, and awareness. *European Journal of Parapsychology, 2,* 137162.

Braud, WG. (1978c). Psi conducive conditions: Explorations and interpretations. In B. Shapin & L. Coly (Eds.), *Psi and states of awareness (pp.* 141). New York: Parapsychology Foundation.

Braud, WG. (1983). Prolonged visualization practice and psychokinesis: A pilot study [Summaryl. In WG. Roll, J. Beloff, & R.A. White (Eds.), *Research in parapsychology 1982* (pp. 187189). Metuchen, NJ: Scarecrow Press.

Braud, WG. (1990). Meditation and psychokinesis. *Parapsychologv Review, 21 (1),* 911.

Braud, WG., & Hartgrove, J. (1976). Clairvoyance and psychokinesis in transcendental meditators and matched control participants: A preliminary study. *European Journal of Parapsycholog*y, 1 (3), 616.

Braud, WG., Smith, G., Andrew, K., & Willis, S. (1976). Psychokinetic influences on random number generators during evocation of "analytic" vs. "nonanalytic" modes of information processing [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology 1975 (pp.* 8 588). Metuchen, NJ: Scarecrow Press.

Breederveld, H., & Jacobs, J.C. (1979). PKexperiments with the German lottogame. *Research Letter, No.* 9, pp. 17.

BrookesSmith, C. (1973). Datatape recorded experimental PK phenomena. *Journal of the Societyfor Psychical Research, 47,* 6989.

BrookesSmith, C., & Hunt, D.W (1970). Some experiments in psychokinesis. *Journal of the Society for Psychical Research, 45,* 265281.

Broughton, R.S. (1979). An experiment with The Head of Jut. *European Journal of Parapsychology, 2,* 337357.

Broughton, R.S., Millar, B., & Johnson, M. (1981). An investigation into the use of aversion therapy techniques for the operant control of PK production in humans. *European Journal of Parapsychology, 3,* 317344.

Broughton, R.S., & Perlstrom, J.R. (1985a). A competitive computer game in PK research: Some preliminary findings [Summary]. In R.A. White & J. Solfvin (Eds.), *Research in parapsychology 1984 (pp.* 7481). Metuchen, NJ: Scarecrow Press.

Broughton, R.S., & Perlstrom, J.R. (1985b). Further studies using a competitive computer PK game. *Proceedings of Presented Papers: The 28th Annual Convention of the Parapsychological Association, Vol.* 2, 457477.

Camstra, B. (1973). PK conditioning [Summary]. In WG. Roll, R.L. Morris, & J.D. Morris (Eds.), *Research inparapsychology 1972 (pp.* 2527). Metuchen, NJ: Scarecrow Press.

Charlesworth, E. A., & Nathan, R. G. (1984). *Stress management: A comprehensive guide to wellness.* New York: Atheneum.

Crookes, W (1972). Sittings with Daniel Dunglas Home. In R.G. Medhurst, K.M. Goldney, & M.R. Barrington (Eds.), *Crookes and the spirit world (pp.* 143225). London, England: Souvenir Press.

Debes, J., & Morris, R.L. (1982). Comparison of striving and nonstriving instructional sets in a PK study. *Journal ofParapsycholog,* 46, 297312.

Dingwall, E.J. (Ed.). (1967). *Abnormal hypnotic phenomena: A survey of nineteenthcentury cases. France.* London: J. & A. Churchill.

Dingwall, E.J. (1968). Hypnotism in Great Britain 18001900. In E.J. Dingwall (Ed.), *Abnormal hypnotic phenomena: A survey of nineteenthcentury cases. United States of America and Great Britain (pp.* 80164). London: J. & A. Churchill.

Dukhan, H., & Rao, K.R. (1973). Meditation and ESP scoring [Summary]. In WG. Roll, R.L. Morris, & J.D. Morris (Eds.), *Research in parapsychology* 1972 (pp. 148151). Metuchen, NJ: Scarecrow Press.

Dunraven, Earl of. (1924). Experiences in spiritualism with D.D. Home. *Proceedings of the Society for Psychical Research,* 35, 2128 5.

Edge, H., & Burke, K. (1980). The effect of feedback and awareness on a PK task [Summary]. In WG. Roll (Ed.), *Research in parapsychology* 1979 (pp. 158159). Metuchen, NJ: Scarecrow Press.

Eliade, M. (1971). *Yoga, immortality andfreedom.* Princeton, NJ: Princeton University Press. (Original work published 1954)

Fairborn, L., Edison, R., Jenks, S., Tyndall, S., & Isaacs, J.D. (1988). An ethnographic study of the "Remote Action Project": A psychokinesis training program [Summary]. In D.H. Weiner & R.L. Morris (Eds.), *Research in parapsychology* 1987 (pp. 2731). Metuchen, NJ: Scarecrow Press.

Feilding, E., Baggally, WW, & Carrington, H. (1909). Report on a series of sittings with Eusapia Palladino. *Proceedings of the Societyfor Psychical Research,* 23, 306569.

Forwald, H. (1969). *Mind, matter andgravitation: A theoretical and experimental study* (Parapsychological Monographs, No. 11). New York: Parapsychology Foundation.

Fourie, D.R (1977). An attempted revival of the Ryzl training method [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsycholoEv* 1976 (pp. 5961). Metuchen, NJ: Scarecrow Press.

George, L. (1981a). A survey of research into the relationships between imagery and psi. *Journal of Parapsychology,* 45, 121146.

George, L. (1981b). *Imagery enhancement: Training program.* Unpublished manuscript.

George, L. (1982). Enhancement of psi functioning through mental imagery training. *Journal of Parapsychology,* 46, 11112 5.

George, L., & Krippner, S. (1984). Mental imagery and psi phenomena: A review. In S. Krippner (Ed.), *Advances in parapsychological research* 4 (pp. 6482). Jefferson, NC: McFarland.

Gissurarson, L. R. (in press). Studies into methods of enhancing and potentially training psychokinesis: A review. Journal *of the American Society* for Psychical *Research.*

Gissurarson, L.R. (1986). RNGPK microcomputer "games" overviewed: An experiment with the videogame "Psi Invaders." *European Journal ofParapsycholoEv,* 6 199-215.

Gissurarson, L.R. (1989). *Psychokinetic attempts on a random event based microcomputer test using imagery strategies.* Unpublished Ph.D. dissertation, University of Edinburgh, Scotland.

Gissurarson, L.R. (1990). Comments on feedback in the literature of psitraining. *Journal of the Societyfor Psychical Research,* 56, 9196.

Gissurarson, L. R. (1991). *Reported auditory* imagery *and its* relationship with visual imagery. Manuscript submitted for publication.

Gissurarson, L.R., & Haraldsson, E. (1989). The Icelandic physical medium Indridi Indridason. *Proceedings of the Societyfor Psychical Research,* 57, 53148.

Gissurarson, L. R., & Morgan, K. (1988). Comments on the Wichmann-Hill random number generator. *SRUBulletin,* 13, 99100, 107108.

Gissurarson, L. R., & Morris, R. L. (1991). *Examination of six questionnaires as predictors of psychokinesis performance.* Manuscript submitted for publication.

Gordon, R. (1949). An investigation into some of the factors that favour the formation of stereotyped images. *BritishJournal of* Psychology, 39, 156167.

Green, E., & Green, A. (1977). *Beyond biofeedback.* New York: Dell.

Gurney, E. (1888). Hypnotism and telepathy. *Proceedings ofthe Socieryfor Psychical Research,* 5,216259.

Haddox, V.G. (1967). Group hypnosis and training for ESP. *Journal of the Societyfor Psychical Research, 44,* 105106.

Haraldsson, E., Houtkooper, J., & Hoeltje, C. (1987). The Defense Mechanism Test as a predictor of ESP performance: Icelandic Study VII and metaanalysis of 13 experiments. *Journal of* Parapsychology, 51, 75 90.

Hedges, L.V., & Olkin, 1. (1980). Votecounting methods in research synthesis. *Psycholok ical Bulletin,* 88, 359369.

Hilgard, J. R. (1970). *Personality and hypnosis: A study of imaginative involvement.* Chicago, IL: University of Chicago Press.

Honorton, C. (1972). Group PK performance with waking suggestions for muscle tension/relaxation and active/passive concentration [Summary]. In WG. Roll, R.L. Morris, & J. D. Morris (Eds.), *Proceedings of the Parapsychological Association,* 1971, pp. 1415.

Honorton, C. (1974a). Psiconducive states of awareness. In F.D. Mitchell & J. White (Eds.), *Psychic exploration: A challengefor science (pp.* 616638). New York: Putnam's.

Honorton, C. (1974b). State of awareness factors in psi activation. *Journal of the American Society for Psychical Research,* 68, 246256.

Honorton, C. (1974c). Apparent psychokinesis on static objects by a "gifted" participant [Summaryl. In WG. Roll, R.L. Morris, & J.D. Morris (Eds.), *Research in parapsychology* 1973 (pp. 128131). Metuchen, NJ: Scarecrow Press.

Honorton, C. (1977a). Effects of meditation and feedback on psychokinetic performance: A pilot study with an instructor of transcendental meditation [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research inparapsychology* 1976(pp. 9597). Metuchen, NJ: Scarecrow Press.

Honorton, C. (1977b). Psi and internal attention states. In B.B. Wolman (Ed.), *Handbook ofjoarapsychologjv (pp.* 435472). New York: Van Nostrand Reinhold.

Honorton, C. (1985). Metaanalysis of psi ganzfeld research: A response to Hyman. *journal of Parapsychology, 49,* 5191.

Honorton, C., & Barksdale, W (1972). PK performance with waking suggestions for muscle tension versus relaxation. *Journal ofthe American Societyfor Psychical Research, 66.* 208214.

Honorton, C., & Krippner, S. (1969). Hypnosis and ESP performance: A review of the experimental literature. *Journal of the American Society for Psychical Research, 63,* 214252.

Honorton, C., & May, E. (1976). Volitional control in a psychokinetic task with auditory and visual feedback [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology* 1975 (pp. 9091). Metuchen, NJ: Scarecrow Press.

Honorton, C., Ramsey, M., & Cabibbo, C. (1975). Experimenter effects in extrasensory perception. *Journal of the American Societyfor Psychical Research, 69,* 135149.

Honorton, C., Tierney, L., & Torres, D. (1974). The role of mental imagery in psimediation. *Journal of* *the American Societyfor Psychical Research,* 68, 385394.

Isaacs, J. (1981). A mass screening technique for locating PKMB agents. *Psycboenergetics, 4,* 125158.

Isaacs, J. (1983a). The Batcheldor approach: A critique [Summary]. In WG. Roll, J. Beloff, & R.A. White (Eds.), *Research in parapsycbologv* 1982 (pp. 5255). Metuchen, NJ: Scarecrow Press.

Isaacs, J. (1983b). A twelvesession study of microPKMB training [Summary]. In WG. Roll, J. Beloff, & R.A. White (Eds.), *Research in parapsycholoEv* 1982 (pp. 3135). Metuchen, NJ: Scarecrow Press.

Isaacs, J. (1984). The Batcheldor approach: Some strengths and weaknesses. *Journal of the American Society for Psychical Research,* 78, 123132.

Isaacs, J. (1986a). Fear of psi in PK training [Summary]. In D.H. Weiner & D.I. Radin (Eds.), *Research inparapsycholoV* 1985 (pp. 152153). Metuchen, NJ: Scarecrow Press.

Isaacs, J. (1986b). PK and conscious awareness [Summary]. In D.H. Weiner & D.I. Radin (Eds.), *Research in parapsychologv* 1985 (pp. 162163). Metuchen, NJ: Scarecrow Press.

Isaacs, J. (1986c). Psychotherapeutic intervention in PiezoPK training studies [Summary]. In D.H. Weiner & D.I. Radin (Eds.), *Research in parapsychology* 1985 (pp. 175176). Metuchen, NJ: Scarecrow Press.

Izadin, D. (1985). Pseudorandom number generators in psi research. *Journal of Parapsychology, 49, 303328.*

Jahn, R.G., & Dunne, B.J. (1987). *Margins of reality: The role of consciousness in thephysical world.* San Diego: Harcourt Brace Jovanovich.

Josephson, B.D. (1983). Patanjali's *Yoga Sutras* and the paranormal. *Psychoenergetics,* 5, 2934.

Keil, H.H.J., Herbert, B., Ullman, M., & Pratt, J.G. (1976). Directly observable voluntary PK effects: A survey and tentative interpretation of available findings from Nina Kulagina and other known related cases of recent date. *Proceedings of the Society for Psychical Research,* 56, 197235.

Kelly, E.F., & Kanthamani, B.K. (1972). A participant's efforts toward voluntary control. *journal of ParapsycholoSy,* 36, 18 5 19 7.

Kelly, E.F., Kanthamani, H., Child, I.L., & Young, F.W (1975). On the relation between visual and ESP confusion structures in an exceptional ESP participant. *Journal of the American Society for Psychical Research, 69,* 131.

Kreiman, N. (1980). Visualization versus intuition [Summary]. *Journal of Parapsycholosy,* 44,286287.

Levi, A. (1979). The influence of imagery and feedback on PK effects. *Journal of Parapsychology,* 43, 275289.

Marks, D. F. (1973). Visual imagery differences in the recall of pictures. *BritishJournal of* Psychology, 64, 1724.

Matas, F., & Pantas, L. (1972). A PK experiment comparing meditating versus nonmedirating participants. In WG. Roll, R.L. Morris, & J.D. Morris (Eds.), *Proceedings of the Parapsychological Association,* 1971, 1213.

May, E.C. (1976). PSIFI: A physiologycoupled, noisedriven random generator to extend PK studies [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsycholo,g* 1975 (pp. 2022). Metuchen, NJ: Scarecrow Press.

May, E. C., Radin, D. I., Hubbard, G. S., Humphrey, B. S., & Utts, J. M. (1986). Psi experiments with random number generators: An informational model. In D. H. Weiner & D. 1. Raclin (Eds.), Research in parapsychology 1985 (pp. 118120). Metuchen, NJ: Scarecrow Press.

McClenon, J., & White, R.A. (1983). Variations on a theme from Batcheldor: A variety of theories regarding the induction of PK [Summary]. In WG. Roll, J. Beloff, & R.A. White (Eds.), *Research in parapsycholog* 1982 (pp. 4852). Metuchen, NJ: Scarecrow Press.

McLeod, A. I. (1985). A remark on algorithm AS 183: An efficient and portable pseudorandom number generator. *Applied* Statistics, 34, 198-200.

Millar, B. (1976). Thermistor PK [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology* 1975 (pp. 7173). Metuchen, NJ: Scarecrow Press.

Millar, B., & Mackenzie, P. (1977). A test of intentional versus unintentional PK [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology* 1976 (pp. 3235). Metuchen, NJ: Scarecrow Press.

Mishlove, J. (1983). Psi *development systems.* Jefferson, NC: McFarland.

Mishlove, J. (1988). Psi *development systems.* New York: Ballantine Books. (Original work published 1983)

Morris, R.L. (1977). The airport project: A survey of the techniques for psychic development advocated by popular books. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology* 1976 (pp. 5456). Metuchen, NJ: Scarecrow Press.

Morris, R. L. (1980). New directions in parapsychology research: The investigation of psychic development procedures. *Parapsychology Review, 11, 14.*

Morris, R.L. (1980a). The airport project: An evaluation of psychic development techniques. *ASPR Newsletter,* 6, 910.

Morris, R.L. (1980b). New directions in parapsychology research: The investigation of psychic development procedures. *Parapsycholog Review,* 11 (2), 14.

Morris, R. L. (1982). An updated survey of methods and issues in ESP research. In S. Krippner (Ed.), *Advances in parapsychological research: Vol.* 3, (pp. 540). New York: Plenum Press.

Morris, R. L. (1984). *Unity I training procedure.* Unpublished manuscript.

Morris, R. L. (1989). Parapsychology. In A. Colman & M. G. Beaumont (Eds.), *Psychology survey 7* *(pp. 232256).* Leicester: British Psychological Society.

Morris, R.L., & Bailey, K. (1979). A preliminary exploration of some techniques reputed to improve freeresponse ESP [Summary]. In WG. Roll (Ed.), *Research in parapsychologv* 1978 (pp. 6365). Metuchen, NJ: Scarecrow Press.

Morris, R.L., & GarciaNoriega, C. (1982). Variations in feedback characteristics and PK success [Summary]. In WG. Roll, R.L. Morris, & R.A. White (Eds.), *Research in parapsychologv* 1981 (pp. 138140). Metuchen, NJ: Scarecrow Press.

Morris, R.L., & Hornaday, J. (1981). An attempt to employ mental practice to facilitate PK [Summary]. In WG. Roll & J. Beloff (Eds.), *Research in parapsychology* 1980 (pp. 103104). Metuchen, NJ: Scarecrow Press.

Morris, R.L., Nanko, M., & Phillips, D. (1979). International observer influence upon measurements of a quantum mechanical system: A comparison of two imagery strategies [Summary]. In WG. Roll (Ed.), *Research in parapsychology* 1978 (pp. 146150). Metuchen NJ: Scarecrow Press.

Morris, R.L., Nanko, M., & Phillips, D. (1982). A comparison of two popularly advocared visual imagery strategies in a psychokinesis task. Journal of Parapsycholog, 46, 116.

Morris, R.L., & Reilly, V (1980). A failure to obtain results with goaloriented imagery PK and a random event generator with varying hit probability [Summary]. In WG. Roll (Ed.), *Research in parapsychologv* 1979 (pp. 166167). Metuchen, NJ: Scarecrow Press.

Motoyama, H. (1969). The present situation of parapsychology in the world. Tokyo, Japan: Institute of Religious Psychology.

Murphy, G. (1969). The discovery of gifted sensitives. Journal of the American Society for Psychical Research, 63, 320.

Nanko, M. (1981). Use of goaloriented imagery strategy on a psychokinetic task with "selected" participants. Journal of the Southern California Society for Psychical Research, 2, 15.

Nelson, R.D., Jahn, R.G., & Dunne, B.J. (1986). Operatorrelated anomalies in physical systems and information processes. Journal of the Society for Psychical Research, 53, 261285.

Nowicki, S., & Duke, M. *P.* (1974). A locus of control scale for noncollege as well as college adults. *Journal of Personality Assessment, 38, 136137.*

Palmer, J. (1978). Extrasensory perception: Research findings. In S. Krippner (Ed.), Advances in parapsychological research 2: Extrasensory perception (pp. 59243). NewYork: Plenum Press.

Palmer, J. (1982). ESP research findings: 19761978. In S. Krippner (Ed.), Advances inparapsychological research 3 (pp. 4182). New York: Plenum Press.

Palmer, J. (1983). Hypnosis and psi: A research program related to the theory of Kenneth Batcheldor [Summary]. In WG. Roll, J. Beloff, & R.A. White (Eds.), Research inparapsychologv 1982 (pp. 5558). Metuchen, NJ: Scarecrow Press.

Palmer, J. (1986). ESP research findings: The process approach. In H.L. Edge, R.L. Morris, J. Palmer,

& J.H. Rush, *Foundations of parapsychology: Exploring the boundaries of human capability* (pp. 184222). Boston: Routledge & Kegan Paul.

Palmer, J., & Kramer, W (1984). Internal state and temporal factors in psychokinesis. *Journal of Parapsychology, 48*, 125.

Palmer, J., & Kramer, W (1987). Release of effort in RNG PK: An attempted replication and extension. *Journal of Parapsychology*, 51, 125136.

Placer, J., Morris, R.L., & Phillips, D.T. (1977). MCTS: A modular communications testing system [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology 1976 (*pp. 3840). Metuchen, NJ: Scarecrow Press.

Pratt, J.G. (1973). A decade of research with a selected ESP participant: An overview and reappraisal of the work with Pavel Stepanek. *Proceedings of the American Society for Psychical Research, 30*, 178.

Pratt, J.G., & Woodruff, J.L. (1946). An exploratory investigation of PK position effects. *Journal of Parapsychology, 10*, 197207.

Rao, K.R. (1966). *Experimental parapsychology: A review and interpretation*. Springfield, IL: Charles C Thomas.

Rhine, J.B. (1946). Hypnotic suggestion in PK tests. *Journal of Parapsychology, 10*, 126140

Rhine, L.E. (1953). Participantive forms of spontaneous psi experiences. *Journal of Parapsychology, 17,* 77114.

Rhine, L.E. (1954). Frequency of types of experience in spontaneous precognition. *Journal of Parapsychology, 18*, 93123.

Richards, J.T (1982). *SORR,4T* A history ofthe Neihardt psychokinesis experiments, 19611981. Metuchen, NJ: Scarecrow Press.

Richer, C. (1889). Further experiments in hypnotic lucidity or clairvoyance. *Proceedings of the Society for Psychical Research, 5*, 6683.

Rosenthal, R. (1966). *Experimenter effects in behavioral research*. New York: AppletonCenturyCrofts.

Ryzl, M. (1962). Training the psi faculty by hypnosis. *Journal of the Society for Psychical Research, 41,* 234252.

Ryzl, M. (1966). A method of training in ESP International. *Journal of Parapsychology, 8* (4), 501532.

Ryzl, M., & Ryzlova, J. (1962). A case of highscoring ESP performance in the hypnotic state. *Journal ofParapsychologv, 26,* 153171.

Schechter, E.I. (1984). Hypnotic induction vs. control conditions: Illustrating an approach to the evaluation of replicability in parapsychological data. *Journal of the American Society for Psychical Research,* 78, 127.

Schmeidler, G.R. (1952). Rorschachs and ESP scores of patients suffering from cerebral concussion. *Journal of Parapsychology, 16,* 8089.

Schmeidler, G.R. (1970). High ESP scores after a swami's brief instruction in meditation and breathing. *Journal of the American Society for Psychical Research, 64,* 100103.

Schmeidler, G.R. (1973a). PK effects upon continuously recorded temperature. *Journal of the American Societyfor Psychical Research, 67,* 325340.

Schmeidler, G.R. (1973b). PK changes in recordings of temperature [Summary]. In WG. Roll, R.L. Morris, & J.D. Morris (Eds.), *Research inparapsycholog* 972(pp.6365). Metuchen, NJ: Scarecrow Press.

Schmeidler, G.R. (1987). Psychokinesis: Recent studies and a possible paradigm shift. In S. Krippner (Ed.), *Advances in parapsychological research 5 (pp.* 938). Jefferson, NC: McFarland.

Schmidt, H. (1976). PK effect on prerecorded targets. *Journal of the American Society for Psychical Research,* 70, 267291.

Schmidt, H. (1982). Collapse of the state vector and psychokinetic effect. *Foundations of Physics, 12, 565581.*

Schmidt, H. (1984). Comparison of a teleological model with a quantum collapse model of psi. *Journal of Parapsychology, 48, 261276.*

Schmidt, H., & Pantas, L. (1972a). Psi tests with internally different machines. *Journal of Parapsychology, 36,* 222232.

Schmidt, H., & Pantas, L. (1972b). Psi tests with psychologically equivalent conditions and internally different machines. In WG. Roll, R.L. Morris, & J.D. Morris (Eds.), *Proceedings of the Parapsychological Association* 1971, pp. 495 1.

Schmidt, H., & Schlitz, M.J. (1989). A largescale pilot PK experiment with prerecorded random events [Summary]. In L.A. Henkel & R.E. Berger (Eds.), *Research in parapsychology* 1988 (pp. 610). Metuchen, NJ: Scarecrow Press.

Shearer, A., & Lannoy, R. (1982). *Effortless being. London: W*ildwood House.

Siegel, *S. (1956). Nonparametric statisticsfor the behavioral sciences.* New York: McGraw Hill.

Sinclair, U. (1962). *Mental radio.* Springfield, IL: Charles C Thomas. (Original work published 1930)

Stanford, R.G. (1969). "Associative activation of the unconscious" and "visualization" as methods for influencing the PK target. *Journal of the American Society for Psychical Research, 63,* 338351.

Stanford, R.G. (1974). An experimentally testable model for spontaneous psi events II: Psychokinetic events. *Journal of the American Society for Psychical Research,* 68, 321356.

Stanford, R.G. (1977a). Experimental psychokinesis: A review from diverse perspectives. In B.B. Wolman (Ed.), *Handbook of Parapsychology (pp.* 324381). New York: Van Nostrand Reinhold.

Stanford, R.G. (1977b). The application of learning theory to ESP performance: A review of Dr. C.T. Tart's monograph. *Journal of the American Society for Psychical Research,* 171, 5580.

Stanford, R. G. (1978). Toward reinterpreting psi events. *Journal of the American Society for Psychical Research, 72, 197 214.*

Stanford, R.G. (1981). "Associative activation of the unconscious" and "visualization" as methods for influencing the PK target: A second study. *Journal of the American Society for Psychical Research, 75,* 229240.

Stanford, R.G. (1984). Recent ganzfeldESP research: A survey and critical analysis. In S. Krippner (Ed.), *Advances in parapsychological research 4* (pp. 83111). Jefferson, NC: McFarland.

Stanford, R.G. (1987). Ganzfeld and hypnoticinduction procedures in ESP research: Toward understanding their success. In S. Krippner (Ed.), *Advances in parapsychological research 5* (Pp. 3976). Jefferson, NC: McFarland.

Stanford, R.G., & Fox, C. (1975). An effect of release of effort in a psychokinetic task [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology* 1974 (pp. 6163). Metuchen, NJ: Scarecrow Press.

Stanford, R.G., & Kottoor, TM. (1986). Disruption of attention and PKtask performance [Summary]. In D.H. Weiner & D.I. Raclin (Eds.), *Research in parapsychology 1985 (pp.* 2124). Metuchen, NJ: Scarecrow Press.

Stanford, R.G., Zenhausern, R., Taylor, A., & Dwyer, M.A. (1975). Psychokinesis as psimediated instrumental response. *Journal of the American Society for Psychical Research,* 69,127133.

Steilberg, B.J. (1975). "Conscious concentration" versus "visualization" in PK tests. *Journal of Parapsychology,* 39, 1220.

Stephenson, C.J. (1965). Cambridge ESPhypnosis experiments, 195864. *Journal of the Society for Psychical Research,* 43, 7791.

Stealberg, B. J. (1975). "Conscious concentration" versus "visualization" in PK tests. *Journal of Parapsychology, 39, 12 20.*

Swann, I. (1975). *To kiss Earth goodbye.* New York: Dell.

Tart, C.T (1966). Card guessing tests: Learning paradigm or extinction paradigm? *Journal of the American Societyfor Psychical Research,* 60, 4655.

Tart, C.T. (1975). *The application of learning theory to ESP performance* (Parapsychological Monographs, No. 15). New York: Parapsychology Foundation.

Tart, C.T. (1976). *Learning to use extrasensory perception.* Chicago, IL: University of Chicago Press.

Tart, C.T. (1977). Towards conscious control of psi through immediate feedback training: Some considerations of internal processes. *Journal of the American Societyfor Psychical Research,* 71, 375407.

Tart, C.T. (1983). Learning to use psychokinesis: Theoretical and methodological notes [Summary]. In WG. Roll, J. Beloff, & R.A. White (Eds.), *Research in parapsycholosy 1982* (pp. 9799). Metuchen, NJ: Scarecrow Press.

Tart, C.T. (1986a). Attitudes toward strongly functioning psi: A preliminary survey. In D.H. Weiner & D.I. Radin (Eds.), *Research in parapsychology 1985* (pp. 150151). Metuchen, NJ: Scarecrow Press.

Tart, C.T. (1986b). Psychics' fears of psychic powers [Summary]. In D.H. Weiner & D.I. Radin (Eds.), *Research in parapsychology 1985* (pp. 151152). Metuchen, NJ: Scarecrow Press.

Tart, C.T., & Labore, C.M. (1986). Attitudes toward strongly functioning psi: A preliminary survey. *Journal of the American Society for Psychical Research, 80,* 163173.

Tart, C.T., Palmer, J., & Redington, D.J. (1979). Effects of immediate feedback on ESP performance: A second study. *Journal ofthe American Societyfor Psychical Research, 73,* 151165.

Terry, J., & Schmidt, H. (1978). Conscious and subconscious PK tests with prerecorded targets [Summary]. In WG. Roll (Ed.), *Research in parapsychology 1977* (pp. 3641). Metuchen, NJ: Scarecrow Press.

Thouless, R.H. (1945). Some experiments on PK effects in coin spinning. *Proceedings of the Society for Psychical Research, 48,* 277281.

Thouless, R.H. (1964). The control of psi phenomena. *Research Journal of Philosophy and Social Sciences,* 1, 7174.

Utts, J. (1988). Successful replication versus statistical significance. *Journal of Parapsychology*, *52*, 305320.

Van de Castle, R.L. (1969). The facilitation of ESP through hypnosis. *American Journal of Clinical Hypnosis,* 12, 3756.

Varvoglis, M.P., & McCarthy, D. (1986). Consciouspurposive focus and PK: RNG activity in relation to awareness, taskorientation, and feedback. *Journal of the American Society for Psychical Research, 80,* 129.

Watkins, G.K., & Watkins, A.M. (1974). Apparent psychokinesis on static objects by a "gifted" participant: A laboratory demonstration [Summary]. In WG. Roll, R.L. Morris, & J. D. Morris (Eds.), *Research in parapsychology 1973* (pp. 132134). Metuchen, NJ: Scarecrow Press.

Watkins, G.K., Watkins, A.M., & Wells, R.A. (1973). Further studies on the resuscitation of anesthetized mice [Summary]. In WG. Roll, R.L. Morris, & J.D. Morris (Eds.), *Research in parapsychology 1972* (pp. 157159). Metuchen, NJ: Scarecrow Press.

Wells, R., & Watkins, G.K. *(1975).* Linger effects in several PK experiments [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology 1974* (pp. 143147). Metuchen, NJ: Scarecrow Press.

White, R.A. *(1964).* A comparison of old and new methods of response to targets in ESP experiments. *Journal of the American Society for Psychical Research, 58,* 2156.

Wichmann, B. A., & Hill, L. D. (1982). An efficient and portable pseudorandom number generator. *Applied Statistics, 31*, 188190.

Wichmann, B. A., & Hill, L. D. (1984). An efficient and portable pseudorandom number generator: Correction. *Applied Statistics, 33*, 123.

Winnett, R., & Honorton, C. *(1977).* Effects of meditation and feedback on psychokinetic performance: Results with practitioners of Ajapa yoga [Summary]. In J.D. Morris, WG. Roll, & R.L. Morris (Eds.), *Research in parapsychology 1976* (pp. 9798)*.* Metuchen, NJ: Scarecrow Press

Zeisel, H. (1986). A remark on algorithm AS 183: An efficient and portable pseudorandom number generator. *Applied Statistics, 35*, 89.