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199b

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Possible Role of Intuitive Data Sorting in Electrodermal Biological Psychokinesis (Bio-PK)

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ABSTRACT: Forty volunteers participated in a study designed to test a hypothesis derived from an intuitive data sorting (IDS) interpretation of the biological psychokinesis (bio-PK) effect. Each of 8 influencers attempted to exert a distant mental influence upon the physiological activity of 4 subjects in a distant room, isolated from all conventional sensorimotor communication. Each laboratory visit consisted of two 15-minute sessions, and each session was divided into 12 influence epochs during which the subject's electrodermal activity (EDA) was monitored and computer-scored. The influencer attempted to decrease the EDA of the distant subject during six of the epochs and increase the EDA during the remaining six epochs. One session was conducted under a new condition in which the influencer was provided with multiple opportunities for intuitive data sorting. In the other session, the influencer had only a single opportunity for epoch-initiation and intuitive data sorting. An "informational" (IDS) interpretation of the bio-PK effect would predict better psi scoring under the multiple than under the single opportunity condition, whereas a "causal" (psychokinetic) interpretation would predict equivalent scoring under the two conditions. The obtained results (significant psi hitting in the single condition, nonsignificant scoring in the multiple condition, and an almost significant scoring superiority of the single over the multiple condition) were more consistent with the causal (PK) than with the informational (IDS) interpretation of the bio-PK effect. Possible artifacts were analyzed and discounted, and the issue of multiple "levels" of IDS potential was treated.

For a number of years, researchers at the Mind Science Foundation have been engaged in studies of the distant mental influence of biological systems (i.e., "biological psychokinesis" or "bio-PK"). Although the biological target systems for some of these studies have included the spatial orientation of fish, the locomotor activity of small animals, and the rate of hemolysis of human red blood cells, the system with which we have worked most often has been the electrodermal activity of another

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person. The experimental protocol of a typical electrodermal bio-PK experiment is as follows. The subject sits in a comfortable room watching a random colored-lights display and listening to random tones through headphones while his or her electrodermal activity is monitored via palmar electrodes. Concurrently, an "influencer" in another room (isolated from all possible conventional sensorimotor interactions with the subject) attempts to mentally influence the ongoing electrodermal activity of the subject according to a predetermined schedule unknown to the subject. The subject's spontaneous electrodermal activity (skin resistance response) is objectively assessed during each of the ten 30-second influence periods and each of ten 30-second noninfluence control periods by means of an analog-to-digital converter interfaced with a microcomputer. By chance, the average electrodermal activity during influence epochs should equal that during control epochs. A statistically significant excess of electrodermal activity in the prescribed direction (i.e., higher influence than control scores under an "activate-aim" condition or lower influence than control scores under a "calm-aim" condition) provides evidence for a psi effect in the experiment.

The protocol just described has been used in a series of 11 electrodermal bio-PK experiments in which a total of 174 subjects have participated. An appropriate method for assessing the statistical significance of the entire series is the z-score addition method described by Rosenthal (1978, 1979, 1984, p. 89). Here, one converts the studies' obtained p values into z scores, sums these z scores, and divides by the square root of the number of studies being combined; the result is itself a z score that can be evaluated by means of an associated p value. This method, when applied to the present data, yields an overall $z = 3.98$, which has an associated $p = .000034$. Thus, the observed psi effect is a reliable and robust one.

We have been interpreting the obtained psi effect as a psychokinetic (causal) influence of the subject's autonomic nervous system activity by the distant, isolated influencer. An alternative possibility, however, is that the effect may be contributed totally or partially by an "intuitive data sorting" (IDS) process. The influencer or experimenter psychically, yet unconsciously, scans the future electrodermal activity stream of the subject and begins an experimental session at a time that maximizes the degree of fit between the ongoing electrodermal activity and the prescribed schedule of influence and control epochs. Stated somewhat differently, the experimenter might psychically and unconsciously sort the subject's electrodermal data into two "bins" so that significantly more of the activity in the prescribed direction falls in the influence bins than in the control bins (see May, Radin, Hubbard, Humphrey, & Utts, 1985). According to this "informational" model, psi functioning is still in evidence, but it is of an informational rather than a causal (psychokinetic) sort.

The present study was designed to test a hypothesis suggested by the IDS model. According to that hypothesis, the effectiveness of intuitive data sorting is proportional to the number of opportunities provided for such sorting. It was hypothesized that a single opportunity to psychically sort a future data stream may not be as effective as multiple opportunities for such sorting. Thus, the scoring rate might be greater if the person who initiates the sampling epochs in a bio-PK session is given the freedom to initiate each epoch at whim (and have, for example, 20 opportunities for intuitive data sorting) than it would be if the person were allowed only a single data-sorting opportunity. On the other hand, according to a causal, psychokinetic interpretation of the bio-PK effect, the scheduling of the sampling epochs should not influence the results; that is, the PK effect should be the same whether the influencer or experimenter has many or few degrees of freedom in deciding when to initiate sampling epochs.

A pilot study was conducted to test the above hypothesis. Twenty-five individuals participated in that study, with 5 serving as influencers and 20 serving as subjects. Each influencer worked with 4 subjects. Each visit to the laboratory consisted of two bio-PK sessions in which the influencer attempted to increase and to decrease the subjects' electrodermal activity, mentally and at a distance, according to a prespecified schedule. For one of these two sessions, the influencer was able to initiate all 20 electrodermal activity sampling epochs by means of button presses, and thus he or she had multiple opportunities for intuitive data sorting. For the other session, only one opportunity for IDS was made available to the influencer. In that pilot study, the scoring rate did not differ significantly for the two conditions, although performance was slightly better in the multiple opportunities condition.

The absence of an overall psi effect in the pilot study may have been due to negative psychological factors attributable to the extreme length of the sessions (often approaching 2½ hours for the entire two-session procedure). In an effort to counter this negative factor, a number of changes were instituted in order to shorten the length of the sessions for this formal study. We originally had planned to have the best two influencers of the pilot study serve as the influencers for the formal study, each working with 16 subjects. We decided, instead, to ask 8 influencers to work with 4 subjects each. This greatly lessened the workload of the influencers. We also drastically reduced the length of each session by (a) reducing the number of sampling epochs from 20 to 12, (b) eliminating the 5-minute adaptation period at the beginning of each session, (c) reducing the range of the variable delay between button press and sampling epoch initiation (see below) to 30–40 seconds, and (d) reducing the duration of the break between the subject's two sessions to one minute. As a result of these changes, the new session lengths for the formal trials were approximately 15 minutes each, and the entire two-session procedure could be accomplished in approximately 40 minutes, rather than the 2½ hours required in the pilot study. It was our hope that these new conditions would render the sessions less trying and would produce more optimal moods in all experimental participants.

METHOD

Subjects

Forty individuals participated in this formal study. Eight persons served as influencers and 32 persons served as subjects; each influencer worked with 4 subjects. The first author served as experimenter for 16 sessions, and the second author served as experimenter for the remaining 16 sessions. One of the 8 influencers was the person who had had the highest performance record in the pilot study; this was also the person who had been least bothered by the lengths of the pilot sessions and who had been most enthusiastic about participating in further experiments. The second influencer had participated successfully in prior electrodermal bio-PK experiments. The third influencer was a psi researcher who had a history of successful psychokinesis performances in his own experiments. The fourth and fifth influencers had participated successfully in several previous psi experiments at the Foundation. The sixth and seventh influencers were very interested in psychic healing and had had ostensible psi healing interactions in their everyday lives. The eighth influencer had participated in previous psi experiments at the Foundation as a subject and as a student experimenter and had expressed an interest in the bio-PK formal experiment. Four influencers were male and 4 were female.

The 32 subjects were selected from a pool of persons expressing interest in participating in bio-PK and other psi experiments. Some participants had previously enrolled in workshops presented by the two authors. Others were undergraduate students from a local college who participated as part of a course requirement. Eight (one-fourth) of the subjects had participated in prior psi experiments conducted at the Foundation; 24 (three-fourths) of the subjects were first-time participants. Twenty-two of the subjects were female and 10 were male.

Apparatus

Experimental apparatus consisted of silver/silver chloride palmar electrodes, a skin-resistance amplifier, an analog-to-digital converter interfaced with a microcomputer, and audio equipment. This equipment was identical to that described in previous reports (Braud & Schlitz, 1983; Schlitz & Braud, 1985), with a single exception: A momentary contact push button was added so that the influencer could initiate sampling epochs.

Procedure

The procedure was similar to that described in Braud and Schlitz (1983). The experimenter met with the influencer and the subject in a comfortable office, explained the purpose and procedure of the experiment, and provided consent forms and general information questionnaires for the influencer and subject to complete. The experimenter then escorted the two participants to the influencer's room and showed the subject where the influencer would be stationed during the experiment. The influencer remained in one room while the experimenter escorted the subject to the subject's room, which was located in an entirely different suite area across an outside corridor and 20 meters away from the influencer's room. Conventional sensorimotor communication between these two rooms was not possible.

The subject was seated in a comfortable recliner chair (which remained in an upright position throughout the experiment), and the experimenter attached two silver/silver chloride electrodes (7 mm diameter) filled with partially conductive electrode gel to the subject's right palm by means of adhesive electrode collars. The subject was told that he or she should make no deliberate effort to relax or to be especially active, but should try to maintain a moderate level of autonomic activation throughout the experiment. This was to be accomplished by watching randomly changing patterns of colored squares of light on a 12-inch display screen 2 meters away and by listening to prerecorded computer-generated random tones through headphones. The subject was asked to allow his or her mind to be as "random" as possible—observing thoughts, images, and feelings as they spontaneously arose, without clinging to any of them. They were asked to make themselves open to and accepting of a distant mental influence by the influencer, but not to try to consciously guess when influence attempts might be made. The subject was, of course, unaware of the number, timing, or scheduling of the various influence attempts.

The experimenter returned to the influencer's room and consulted a sealed envelope to learn the influence epoch sequence for the session. A set of these sequence envelopes had been prepared beforehand by an assistant who was not otherwise involved in the experiment. The envelopes had been prepared using a table of random numbers with a method that minimized the preparer's degree of freedom in making arbitrary decisions about where to enter the table and how to assign conditions to the random numbers (see Stanford, 1981, for the rationale underlying this method). The envelope indicated whether the influence epoch sequence was to be calm-activate-activate-calm (CAAC) or its opposite (ACCA). This counterbalanced sequence was used for the 12 sampling epochs of a session. The experimenter entered the proper sequence into the computer, recorded the subject's initial basal skin resistance, started the computer program that controlled the experiment, and then started playing the audiocassette that presented the subject's random tones.

The new element that had been added to this experiment to test the IDS hypothesis was described to the influencer by the experimenter. The influencer was to press a button at what he or she intuitively felt to be the optimal time for beginning the next sampling epoch. The influencer was

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told that it might be possible to psychically, yet unconsciously, scan the future autonomic activity data stream of the subject and press the button so as to optimally sort the subject's activity into the appropriate sampling epochs—thereby increasing the scoring rate. The addition of this IDS option is, of course, accompanied by psychological factors such as beliefs and expectations that might obscure its true effectiveness. Therefore, a procedure was designed that would allow us to control for such psychological factors. This procedure required a contrast condition in which the influencer appeared to be initiating sampling epochs by means of his or her button pressing, but in reality was not. This was accomplished in the following manner. In the condition that we expected would optimize IDS, the influencer's button presses initiated sampling epochs after randomly determined variable delays. In this condition (the MULTIPLE SEEDS condition), the precise times of occurrence of the button presses were crucial in determining the delay periods, because the button presses selected the clock values that served as the different seeds for the pseudorandom algorithm that generated the values of the delays. Thus, button presses actually could be efficacious in determining sampling scheduling. In the contrast condition (the SINGLE SEED condition), all random delay periods were determined by the first of the influencer's 12 button presses. The computer's clock value at the time of this first button press seeded the pseudorandom algorithm once and only once, and all other button presses "fetched" their random delays from the already determined outcome of that first seeding.

The use of randomly varying delays between button presses and sampling epoch initiations accomplished two things: (a) They allowed the influencer and the experimenter to remain blind as to whether a SINGLE SEED or MULTIPLE SEEDS condition was in effect for a given session (i.e., whether the last 11 button presses were really influencing sampling epoch scheduling or not), and (b) their unpredictable nature prevented the influencer from simply observing the subject's electrodermal chart tracing and making sensorially and logically informed guesses about the optimal times to press the button and initiate sampling (i.e., to initiate sampling on the basis of knowledge of the likely time course of the subject's autonomic activity, based upon observation of the chart tracing). The delays between button press and sampling epoch initiation varied within a 30- to 40-second range.

Each of the 12 30-second sampling epochs was signaled by a continuous, low-frequency tone that was audible only to the experimenter and the influencer. During the six calm-aim (C) epochs, the influencer attempted to psychically decrease the distant subject's sympathetic nervous system activity. Three types of strategies were used to accomplish this goal: (a) calming and relaxing oneself and intending for the subject to respond similarly, (b) visualizing the subject in tranquil and relaxing situations and settings, and (c) attending to the polygraph feedback and visualizing and intending for a flat tracing. During the six activate-aim (A) epochs, the influencer attempted to increase the distant subject's sympathetic nervous system activity. Three types of strategies were used to accomplish this goal: (a) activating oneself and intending for the subject to respond similarly, (b) visualizing the subject in exciting, active situations and settings, and (c) attending to the polygraph feedback and visualizing and intending for a tracing filled with frequent and large pen deflections. The influencer was given the option of whether or not to view the chart tracings. Some influencers found this real-time feedback helpful, whereas others found it distracting and preferred to simply close their eyes and visualize the subject responding appropriately.

In order to minimize participant-scheduling difficulties and to minimize variability, a within-subject design was used in which each subject's visit to the lab involved two sessions, one under the SINGLE SEED condition and one under the MULTIPLE SEEDS condition. The influencer and the experimenter (and, of course, the subject) remained unaware of which conditions were in effect in the two respective sessions until the end of the second session, at which time a computer printout revealed the condition sequence. The order of the two conditions was determined randomly by a computer algorithm that was seeded before the first session—based upon the timing of a carriage return that occurred while the experimenter was entering keyboard information about the subject's name, the date and time of the session, etc. Each of the two sessions required approximately 15 minutes for completion. The two sessions were separated by a brief break of approximately one-minute duration.

At the conclusion of the second session, the computer generated a printout of the subject's average electrodermal activity during each of the 12 sampling epochs of each of the two sessions, along with an indication of the order of the two (SINGLE or MULTIPLE SEEDS) conditions. The experimenter returned to the subject's room, removed the headphones and palmar electrodes, then returned with the subject to the experimenter's office where the influencer was now waiting. The influencer and the subject discussed their experiences during the sessions while the experimenter calculated the experimental results, based upon the printout. The three participants discussed the outcome of the experiment and then concluded their visit.

All procedural details that have not been mentioned explicitly may be found in Braud and Schlitz (1983). That paper provides information about specific equipment, electrodermal sampling, etc.

Three a priori statistical analyses were planned:

1. A comparison of the psi scores (calm-aim percentage scores; see below) for the two SEEDS conditions. This analysis would involve a matched (dependent) t test performed on the 32 pairs of scores. Because no directional prediction was made in this case, a two-tailed test was planned, with alpha set at .05.

2. A determination of whether a psi effect occurred in the SINGLE SEED condition. For this analysis, a single-mean t test would be used to

compare the 32 psi scores with a mean chance expectation (MCE) of 50%. Because a directional (i.e., psi hitting) prediction was made in this case, a one-tailed test was planned, with alpha set at .05.

3. A determination of whether a psi effect occurred in the MULTIPLE SEEDS condition. For this analysis, a single-mean *t* test would be used to compare the 32 psi scores with an MCE of 50%. Because a directional (i.e., psi hitting) prediction was made in this case, a one-tailed test was planned, with alpha set at .05.

Results

For each session, a total score was calculated for all 12 recording epochs (6 calm-aim and 6 activate-aim). This total score was divided into the sum of the mean electrodermal activity scores for the 6 calm-aim epochs; the process was repeated for the activate-aim epochs. In the absence of a psi effect, these two ratios [C/(A + C), A/(A + C)] should approximate 50%. A psi effect would be evidenced by a set of calm-aim percentage scores that were significantly lower than 50%.

An analysis (independent samples *t* test) was performed to determine whether there was a scoring difference in the runs conducted by the two different experimenters. The scores were found not to differ significantly for the two experimenters. Therefore, scores were pooled across experimenters for the following analyses.

Our first analysis was a determination of whether the 32 subjects' SINGLE-SEED calm-aim percentage scores differed significantly from their MULTIPLE-SEEDS calm-aim percentage scores. Because our prior research has indicated that the percentage scores in these bio-PK experiments do not depart significantly from a normal distribution, we tested the SINGLE SEED versus MULTIPLE SEEDS within-subjects contrast by means of a matched *t* test. The mean calm-aim percentage score was lower (i.e., more in the direction of psi hitting) in the SINGLE SEED ($\bar{X}$ = 42.62%, SD = 19.20) than in the MULTIPLE SEEDS ($\bar{X}$ = 52.06%, SD = 21.59) condition. This difference very closely approached statistical significance ($t[31] = 1.75$, $p = .08$, two-tailed).

Our second analysis tested for the presence of a psi effect in the SINGLE SEED condition. This effect was assessed by means of a single-mean *t* test in which the 32 calm-aim percentage scores were compared with a mean chance expectation of 50%. The mean calm-aim percentage score was significantly below chance (i.e., in the expected psi hitting direction), yielding the following summary statistics: $\bar{X}$ = 42.62%, SD = 19.20, $t[31] = 2.14$, $p = .019$, one-tailed.

Our third analysis tested for evidence of a psi effect in the MULTIPLE SEEDS condition. This effect was assessed by means of a single-mean *t* test in which the 32 calm-aim percentage scores were compared with MCE = 50%. The mean calm-aim percentage score was slightly and nonsignificantly above chance (i.e., in the unexpected missing direction), yielding the following summary statistics: $\bar{X}$ = 52.06%, SD = 21.59, $t[31] = -0.53$, $p = .70$, one-tailed.

In summary, the above three formal, a priori analyses provided strong evidence for a psi effect in the SINGLE SEED condition ($p = .019$), no evidence for a psi effect in the MULTIPLE SEEDS condition ($p = .70$), and a psi score superiority of the SINGLE SEED over the MULTIPLE SEEDS condition that very closely approached significance ($p = .08$, two-tailed).

Discussion

In the pilot study that preceded this experiment, no evidence of a psi effect was found in the data. We hypothesized that the absence of psi may have been contributed by negative moods in all participants (subjects, influencers, and experimenters) due to the extreme length of the experimental sessions (often 2½ hours long). Therefore, we drastically shortened the session lengths, hoping to eliminate this negative factor. Our modifications (described earlier) appear to have been successful because evidence for psi did emerge in the present experiment.

The major hypothesis that was being tested in this study, derived from an IDS conceptualization of the bio-PK effect, was that greater psi scoring would occur in the condition in which there were multiple opportunities for intuitive data sorting (i.e., the MULTIPLE SEEDS condition) than in the condition in which there was only one such opportunity (i.e., the SINGLE SEED condition). The outcome of this experiment was not consistent with this informational interpretation of the bio-PK effect. Significant psi scoring occurred in the "older" condition that had been in effect in all of our prior bio-PK research—namely, a SINGLE SEED condition. Significant psi scoring failed to emerge in the new condition that was hypothesized to favor enhanced intuitive data sorting (i.e., the MULTIPLE SEEDS condition). In fact, the superiority of the SINGLE SEED condition over the MULTIPLE SEEDS condition closely approached statistical significance. Had the conditions comparison actually reached significance, that finding of superior SINGLE SEED condition performance would have been quite difficult to explain in IDS terms. As it is, the absence of MULTIPLE SEEDS condition superiority is not consistent with an informational interpretation, but is more congruent with a causal or psychokinetic interpretation of the bio-PK effect.

The reason for the absence of a significant bio-PK effect in the MULTIPLE SEEDS condition is not clear. One might speculate that the provision of a second, potentially effective, psychic task in that condition may have resulted in a form of "distraction" that could have disrupted the influencer's PK performance, mediated perhaps by an increased diffusion or "spreading thin" of the influencer's attention (see Braud, 1978, for an

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elaboration of this "spreading-thin possibility"). If this were indeed the case, it would constitute a remarkable finding, because the potential effectiveness of the multiple button presses in the MULTIPLE SEEDS but not in the SINGLE SEED condition is not discernible at a conventional sensorimotor level (due to the double-blind stratagem by which the effectiveness of button presses was disguised for both influencer and experimenter). The potential efficacy of button presses in the MULTIPLE SEEDS but not in the SINGLE SEED condition would have to be discerned at another level, viz., via psi functioning. This issue certainly warrants additional investigation.

Artifact Analyses

In all of our previous bio-PK experiments that did not involve an explicit IDS element, the scheduling of the sampling epochs was completely predetermined and entirely beyond the normal sensorimotor control of the influencer. In the IDS bio-PK experiment reported here (as well as in its pilot study), however, the initiation of sampling epochs came under the control of the influencer. It is important, therefore, to rule out the possibility that the influencer could have initiated sampling epochs on the basis of knowledge of the time course of the subject's electrodermal activity, derived through observation of the polygraph tracing.

Two possibilities of artifactual inflation of scoring rate must be ruled out. The first possibility to be considered is whether the influencer might have observed the chart tracing, waited until an electrodermal response *burst* was beginning to occur, then quickly pressed the button in order to capture that burst within the next sampling epoch. The possibility of this particular artifact may be ruled out completely because of the relative durations of electrodermal response bursts and the button press sampling epoch interval. Response bursts were typically a few seconds in duration and rarely, if ever, as long as 10 seconds. The button press sampling epoch interval, on the other hand, was 30 to 40 seconds in duration. Thus, even if the influencer could have noted the onset of a lengthy response burst and pressed the button immediately, the burst would have been over long before the sampling epoch began. In fact, this was the rationale for selecting the particular button press sampling epoch interval used in this study.

The second artifact possibility to be considered is whether the influencer may have taken advantage of feedback-discerned *trends* in electrodermal activity in order to initiate sampling at optimal times. This would require a consistent relationship between electrodermal activity at time t and electrodermal activity occurring more than 30 to 40 seconds later. The presence or absence of such a relationship could be determined by means of autocorrelation procedures carried out at increasing lag lengths. Ideally, continuous records would be available that could be divided into a large number of adjacent sampling intervals of short duration. The records could be examined by autocorrelation techniques for lags corresponding to fractions of a second to several seconds or minutes, in order to determine the presence and temporal characteristics of possible trends. Such fine-grained, continuous records were not available in these studies. However, electrodermal activity had been sampled, averaged, and printed for the 30-second intertrial or rest periods immediately preceding each of the 12 sampling epochs. The influencer typically pressed the button almost immediately after one sampling epoch in order to begin the next interval as quickly as possible; the latter interval consisted of the 0- to 10-second random delay yielded by the seeded algorithm, a 30-second intertrial or rest period, and the 30-second sampling epoch itself. Thus, in the present experiment, mean electrodermal activity data were available for what closely approximated 24 successive 30-second periods. An autocorrelation coefficient calculated for Lag 2 would provide a good estimate of a possible trend for electrodermal activity at time t to be related to activity shortly after 30 to 40 seconds had elapsed. Such Lag 2 autocorrelation coefficients were calculated for each of the 32 sessions of the SINGLE SEED condition and for each of the 32 sessions of the MULTIPLE SEEDS condition. The autocorrelations were found to be quite small and were not significantly different from zero for either the SINGLE SEED condition ($\bar{X}$ = 0.059, $t[31]$ = 1.51, p = .14, two-tailed) or the MULTIPLE SEEDS condition ($\bar{X}$ = 0.027, $t[31]$ = 0.78, p = .44, two-tailed).[2]

As an additional check of the trend artifact possibility, we calculated the overall correlation between the 64 Lag 2 autocorrelation coefficients and the 64 bio-PK scores (i.e., the calm-aim percentage scores) of the present experiment. The correlation was nonsignificant and was extremely close to zero (r = −.00278); it indicated no relationship between psi scoring and electrodermal temporal trend at the appropriate time interval. Thus, both artifact possibilities may be effectively ruled out for this experiment.

[2] Autocorrelation coefficients (r_k) were calculated according to the formula:

$$r_k = \frac{\sum_{t=1}^{n-k}(z_t - \bar{z})(z_{t+k} - \bar{z})}{\sum_{t=1}^{n}(z_t - \bar{z})^2}$$

Where k = the lag number $\quad z_t$ = raw score at time t

n = total number of values being correlated $\quad \bar{z}$ = mean score

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A Final Issue

Finally, it could be argued that the SINGLE SEED condition itself may have provided sufficient opportunity for effective intuitive data sorting to occur, particularly if one ascribes a "goal-oriented" (see Schmidt, 1974, pp. 190–191) or "diametric" (see Foster, 1940; Nash, 1986, pp. 202–203) property to the psi process. There is a danger, however, in positing increasingly higher levels at which intuitive data sorting and goal-directedness may operate, and that danger is that both of those notions ultimately become untestable. Testability of the intuitive data sorting and goal-orientation concepts requires an operational specification of *degrees* of those possibilities; otherwise, the concepts become empirically intractable. The present study, in fact, represented an initial attempt to operationalize and test those concepts.

It might be argued that the provision to our influencers in both SEED conditions of freedom to initiate sampling events by button presses may have effectively washed out the difference in IDS potential between the two conditions and rendered them, from an IDS perspective, indistinguishable. To such a criticism, we respond that (a) despite this freedom factor that is common to both conditions, the two conditions continued to differ in quantity or degree of freedom and, hence, intuitive data sorting possibility, and (b) had such freedom *not* been provided, a serious *psychological* difference between the two SEED conditions would have been established that would have rendered any experimental outcome uninterpretable. In our tests of the IDS model, we wished the experimenters, the influencers, and the subjects to be unaware of how much control the influencers could exert over the sorting process. Thus it was important to create in the influencers (and experimenter) the *illusion* of control. This required the use of events that the influencers could initiate by button presses. Influencers pressed a button to initiate events in both the SINGLE SEED and MULTIPLE SEED conditions. If this had not been done, and if events had started automatically for the influencers in the "less-opportunity-to-data-sort" condition, the influencers would have known that they had less control of events in that condition, and this would have introduced a major psychological confounding factor into the experiment. In the experiment as actually conducted, the influencers felt they had equivalent control over events in the two conditions, and the psychological confound was eliminated. This, of course, added an extra element of data sorting for the influencers throughout the study. However, we were still able to provide different degrees of data-sorting opportunity to the influencers in the various conditions, and we assumed that such degrees should correlate with psi scoring if IDS played a major role in our bio-PK effect. Several levels of IDS were possible for the influencers and experimenters throughout the experiment, but the influencers had one extra level of IDS potential in the MULTIPLE SEEDS condition, and this extra level did not appear to help scoring. We can think of no alternative method of testing the IDS notion in this manner that would solve this particular problem without violating the necessary blind condition for the influencers and experimenters.

A related issue involves our use of a computer keypress to seed a pseudorandom algorithm to determine the order of the two SEEDS conditions for an experimental session. Could such a maneuver have provided the *experimenter* with an important additional opportunity for intuitive data sorting? In response to a possible criticism along these lines, we argue that no alternative was possible. *Any* choice of order for the two conditions would have been susceptible to IDS, regardless of how or when it was done. In the present experiment, it was necessary for everyone to be blind with respect to the order of conditions. Therefore, it was necessary that the order assignment be done by computer, in an unpredictable manner. This necessitated a randomizing method of the type employed.

The possible role of intuitive data sorting in biological psychokinesis and in other manifestations of psi clearly deserves further study. Alternative strategies for testing the IDS model are already being explored at the Mind Science Foundation, and we hope to develop still other methods in the future.

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Age and Stimulus in Past Life Memory Cases: A Study of Published Cases

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ABSTRACT: Ninety-five published past life memory cases in which the previous person was identified were analyzed for the relationship between the subject's age at the time of first speaking of the previous life and the presence of a stimulus to the memories on that occasion. These factors also were analyzed in subseries of 30 Indian and 65 non-Indian cases, and the results of the analyses were compared. The proportion of stimulated to unstimulated cases was found to vary significantly between younger and older age groups in the main series (p = .00005), the Indian subseries (p = .0014), and the non-Indian subseries (p = .0079), using chi-square tests. In a two-factor ANOVA with age as the dependent variable, the main effect of type of case (stimulated vs. unstimulated) was significant (p = .0006), but the interaction between type of case and culture (Indian vs. non-Indian) was not significant.

Research on reincarnation during the almost 30 years since Ian Stevenson (1960a, 1960b) published his seminal paper, "The Evidence for Survival from Claimed Memories of Former Incarnations," in this *Journal,* has been mainly proof-oriented: that is, it has been largely concerned with the investigation of past life memory cases and with the establishment of reincarnation as the best available interpretation of them.

Analyses of process-related variables have been reported from time to time (e.g., see Stevenson, 1970), but process-oriented studies have begun to appear only recently. Chadha and Stevenson (1988) identified two correlates of violent death in past life memory cases, and I (Matlock, 1988a, 1988b) have related the age of the subject at the time of first speaking of the previous life to the strength of the claimed memories.

That the subject's age may play a crucial role in past life memory cases is suggested by the sharp contrast between the reports of adults and children. Children's cases may include not only numerous verifiable statements, but also recognitions of persons associated with the previous life and behavioral and even physical correspondences between the subject and the previous person (Stevenson, 1987).

Children often begin to speak about previous lives spontaneously, without apparent stimulus,[2] and continue to do so for several years before

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[2] In their phenomenology, past life memories seem to resemble what psychologists call "involuntary" autobiographical memories (see Neisser, 1982; Rubin, 1986). Involuntary memories need not be entirely spontaneous, but may be stimulated by a variety of environmental cues, often quite subtle ones (Salaman, 1970). Examples of stimuli (cues) to past life memories are given below.

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