Journal of Scientific Exploration, Vol. 3, No. 1, pp. 43–63, 1989
Pergamon Press plc. Printed in the USA.

0892–3310/89 $3.00+.00

A Methodology for the Objective Study of Transpersonal Imagery*

WILLIAM BRAUD and MARILYN SCHLITZ

Psychology Laboratory, Mind Science Foundation, 8301 Broadway, Suite 100, San Antonio, Texas 78209

Abstract — Abundant methodologies already exist for the study of *preverbal* imagery, in which one's imagery acts upon one's own cellular, biochemical, and physiological activity. This paper reports a new methodology for the objective study of transpersonal imagery, in which one person's imagery may influence the physical reactions of another person. The method involves the instructed generation of specific imagery by one person and the concurrent measurement of psychophysiological changes in another person who is isolated in a distant room to eliminate all conventional sensorimotor communication. Thirteen experiments were conducted using this methodology. A significant relationship was found between the calming or activating imagery of one person and the electrodermal activity of another person who was isolated at a distance (overall $z = 4.08$, $p = .000023$, mean effect size = 0.29). Potential artifacts which might account for the results are considered and discounted. The findings demonstrate reliable and relatively robust anomalous interactions between living systems at a distance. The effects may be interpreted as instances of an anomalous "causal" influence by one person directly upon the physiological activity of another person. An alternative interpretation is one of an anomalous informational process, combined with unconscious physiological self-regulation on the part of the influenced person. Additional research is being conducted in an attempt to increase our understanding of the processes involved, as well as to learn the various physical, physiological and psychological factors that may increase or decrease the likelihood of occurrence of the effect.

Introduction

In her book Imagery in Healing (Achterberg, 1985), psychologist Jeanne Achterberg distinguished two types of imagery which may have positive impacts upon health. In preverbal imagery, the imagination acts upon one's own physical being to alter cellular, biochemical, and physiological activity. The study of such imagery has a long history, and there exist a variety of successful methodologies for its objective evaluation. The second type of imagery that Achterberg identified is transpersonal imagery, which "embod-

* A condensed version of this paper was presented at the Second World Conference on Imagery, Toronto, Canada, June 25–28, 1987.

Acknowledgement. We are grateful to Dr. Dean Radin for his helpful suggestions and comments on this paper.

ies the assumption that information can be transmitted from the consciousness of one person to the physical substrate of others" (p. 5). She suggested that the validation of transpersonal imagery must be sought in the more qualitative types of observational data gathered by anthropologists, theologians, and medical historians, and in intuitive philosophical speculation.

Indeed, the power of preverbal imagery in influencing one's own chemical, cellular, physiological and behavioral reactions has been well documented. We find extensive evidence for such psychosomatic influences in the areas of dreaming, hypnosis, relaxation, autogenic training, biofeedback, meditation, therapeutic imagery, mental rehearsal, and placebo effects. Some of the most exciting (and potentially useful) findings regarding the influence of imagery on somatic functioning are now being reported by researchers within the new interdisciplinary field of psychoneuroimmunology, in which it is being discovered that individuals, through use of relaxation, hypnosis, and imagery techniques, may be able to exert rapid and quite specific influences upon certain subpopulations of their white blood cells [see, for example, Hall (1984a, 1984b, 1987); Peavey (1982); Schneider, Smith, & Whitcher (1984)].

Less well known are the various observations which tend to support the reality and effectiveness of transpersonal imagery effects. There are, of course, abundant anecdotes and field observations that the sensations, thoughts, feelings and images of one person may, under certain conditions, directly affect the bodily reactions of another person, even when the two persons are separated by great distance, and when the influenced person is not aware that an influence attempt is being made. Observations of ostensible distant mental influence in the context of anthropology have been reviewed by Angoff and Barth (1974), Long (1977) and Van de Castle (1977). The late Eric Dingwall, in his four-volume work, *Abnormal Hypnotic Phenomena* (1968), surveyed many cases of putative distant mental influence which occurred in 19th-century practices of hypnosis (or "mesmerism," as it was then called). Two of the more interesting of these "higher phenomena of hypnosis" were (a) *community of sensation,* in which hypnotized subjects were reported to have responded appropriately to sensory stimuli presented to a distantly located hypnotist, and (b) *mental suggestion,* in which the hypnotist was alleged to have exerted an influence upon a distant subject's behavior (while the latter was in a hypnotic "trance") or even to have induced hypnosis itself at a distance. These phenomena, as well as the results of more modern hypnotic investigations, have been examined by Honorton (1974, 1977). Finally, possible distant mental influence effects occurring within the context of mental healing have been reviewed by Ehrenwald (1977) and by Solfvin (1984).

The possibility of distant somatic effects of imagery is also suggested by anecdotal reports of various investigators involved in clinical biofeedback applications who sometimes observed unusual correlations between the changes in electrophysiological activity of one client and those of another

client (in group biofeedback training sessions) or between the client's activity and that of the investigator himself or herself. If such coincident physiological patterns are reliable and replicable, they might be explained most parsimoniously by assuming that they result from either (a) gross or subtle external stimuli that influence both persons in the same manner, or (b) internal rhythms that happen to be in phase in the two persons and interact with the monitored activities in identical ways. A third possibility, however, is that at least some proportion of these physiological congruences may be attributable to transpersonal imagery effects. Such a possibility would be highly speculative were it not for several reports of experimental findings of similar interactions between, for example, the electroencephalic (Duane & Behrendt, 1965; Puthoff & Targ, 1976; Targ & Puthoff, 1974) or autonomic (Dean, 1966) activity of one person and that of another person, when those persons were remotely situated, shielded, and the possibility of conventional energetic and informational exchanges between them had been eliminated. Indeed, the entire body of research findings in the areas of psychical research and of parapsychology is relevant to and supportive of the notion that the mental activity of one person may influence the bodily activity of another person at a distance. Quite complete and useful reviews of the concepts, methods, findings, and theories of modern parapsychology may be found in Edge, Morris, Palmer and Rush (1986); Krippner (1977, 1978, 1982, 1984); Nash (1986); and Wolman (1977).

The Present Research Program: Purpose and Overview

In this paper, we describe an objective, quantitative methodology for the study of transpersonal imagery which allows the investigation of the latter within the framework of experimental psychology. In addition to the methodology itself, we shall present the promising results of 13 experiments that we already have conducted in order to test the usefulness of the procedure.

The method involves the instructed generation of specific imagery by one person, and the concurrent measurement of psychophysiological changes in *another* person. Throughout the experiment, the two persons occupy separate, isolated rooms, and all conventional sensorimotor communication between the two persons is eliminated in order to insure that any obtained effects are truly transpersonal. In a typical experiment, Person A is instructed to use specific mental imagery in order to induce a specific physiological change in Person B, who is isolated in a distant room. The expected psychophysiological effect is assessed by measuring the spontaneous electrodermal activity (skin resistance responses, SRR) of Person B during 20 30-second recording epochs. During 10 of these epochs, interspersed randomly throughout the sequence of 20 epochs, Person A generates imagery designed to produce a specific somatic effect (decreased sympathetic nervous system activity in some cases, increased sympathetic activation in other cases); the remaining 10 epochs serve as Control periods during which

Person A does not generate the relevant imagery. Person B is, of course, unaware of the sequence of the two types of epochs (the sequence is randomly determined) and is also "blind" to the exact starting time of the experiment, the number and timing of the various periods, etc. Electrodermal activity is objectively assessed by an electrodermal amplifier interfaced with an analog-to-digital converter and a microcomputer. The amount of electrodermal activity during the Imagery epochs is compared with that of the Control epochs using conventional parametric statistical techniques.

If the experimental protocol just described is not violated, and yet it is found that significantly greater somatic activity of an appropriate, imagery-relevant type is found to occur during the Imagery periods than during the Control periods, we can conclude with confidence that a transpersonal imagery effect (TIE) has occurred, and that the results cannot be attributed to (a) conventional communication channels or cues (since the two parties are isolated from contact with each other through the use of distant, isolated rooms), (b) common external signals, common internal rhythms, or rational inference of the imagery/nonimagery schedule and resultant appropriate self-regulation (since the imagery/nonimagery schedule is truly randomly determined and is unknown to Person B), or (c) "chance coincidence" (since the level of responding to be expected on the basis of chance alone may actually be determined and compared statistically with the obtained response levels).

Method

Subjects

The experiments involved the participation of unpaid male and female volunteer subjects, ranging in age from 16 to 65 years. Participants were selected from a pool of volunteers from the San Antonio community who had learned about the Foundation's experiments through local newspaper advertisements and articles, notices posted throughout the city, lectures given by Foundation staff at local colleges and universities, and comments from other participants, and whose interest in the experiments and time schedules permitted participation. Approximately equal numbers of males and females participated in the various studies. In most cases, participants were not selected on the basis of any special physical, physiological, or psychological characteristics, and could best be described as "self-selected" on the basis of their interest in the topics being researched. In only one experiment were "special" subjects recruited and selected. This was an experiment in which we were interested in whether persons having a greater "need" for a possible *calming* influence would evidence stronger results than persons without such a need. Therefore, for that experiment, we selected individuals who self-reported symptoms of greater than usual sympathetic autonomic activation—i.e., stress-related complaints, excessive emo-

tionality, excessive anxiety, tension headaches, high blood pressure, ulcers, or mental or physical hyperactivity. The subjects for this experiment were also screened in an initial electrodermal activity recording session to guarantee that they did in fact exhibit greater than average sympathetic autonomic activity.

The persons who served as "influencers" in these experiments (i.e., those who regulated their own images and intentions in order to influence the subjects at a distance) were selected from a similar pool of volunteers. In some experiments, the experimenters themselves served as influencers. In still other experiments, the influencers were individuals who were interested in unorthodox healing and who themselves practiced certain mental healing techniques, such as "therapeutic touch" (see Borelli & Heidt, 1982; Krieger, 1979; Kunz, 1985) or "Reiki healing" (see Schlitz & Braud, 1985). Many of the influencers were practitioners of various forms of meditation and self-exploration. In most cases, however, the influencers were simply interested persons from the local community who wished to give the experiments a try.

The authors served as the experimenters for the series of studies, assisted in some experiments by two other experimenters, J. C. and H. K. The first author had extensive research experience in the areas of experimental psychology, physiological psychology, and parapsychology. The second author had extensive experience in parapsychological and anthropological research. The third experimenter, J. C., had research experience in the area of nursing. The fourth experimenter, H. K., was a student at a local college who was participating in a research practicum at the Foundation.

In all, 337 persons participated in these experiments. Of these participants, 271 served as subjects, 62 as influencers, and 4 as experimenters.

Procedure

Physical Layout. During the experimental sessions, it was essential to guarantee that the influencer and the experimenter would not be able to communicate with the subject via conventional sensorimotor channels. This was accomplished by situating the experimenter and the influencer in one closed room, while the subject occupied a distant second room, which was also closed. Figure 1 illustrates the floor plan of the rooms used in Experiments 1 through 10. The rooms used in Experiments 11 through 13 are shown in Figure 2. The distance (20 meters or more) between the two rooms used in an experiment, and the presence of several intervening closed doors and corridors, isolated the participants from possible sensory interaction. Additionally, verbalization of any information regarding the imagery/nonimagery schedule (see below) by the influencer or the experimenter was not allowed during the experimental sessions. There were no active microphones in either room, through which participants could communicate. The headphones through which the participants in the two rooms received required auditory information were attached to independent electrical circuits

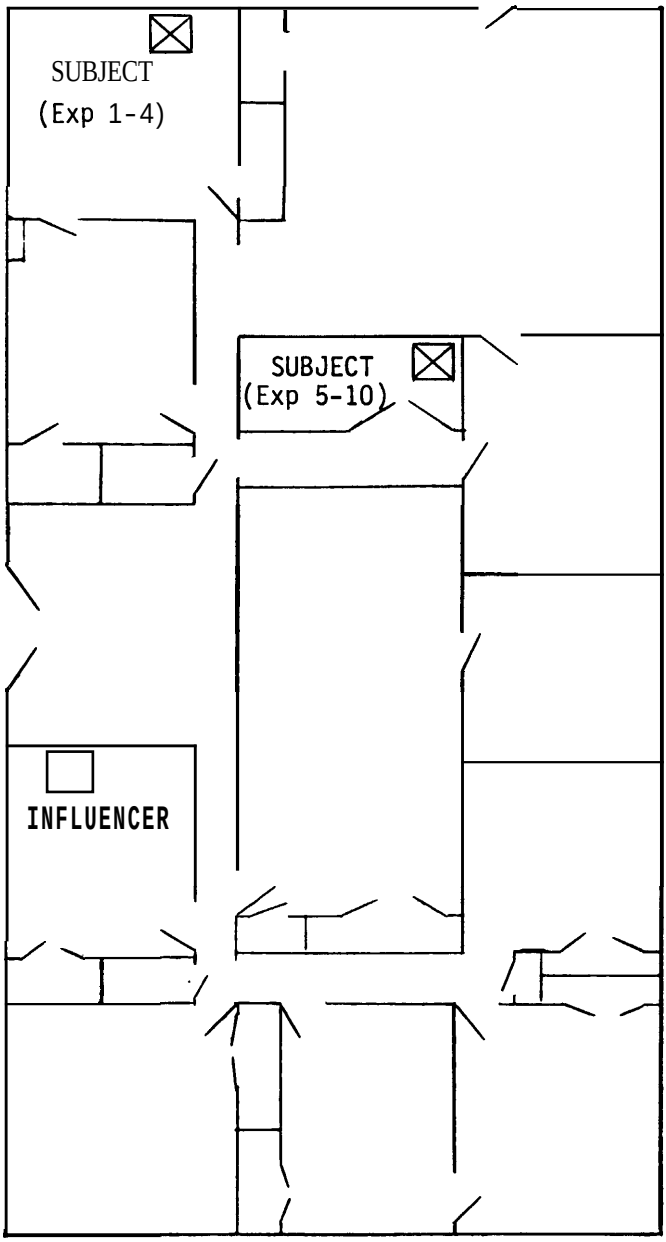

Fig. 1. Laboratory floor plan showing locations of subject and influencer for Experiments 1 through 10.

so that possible "crosstalk" between two sets of headphones was eliminated (i.e., it was impossible for one person's headphone to function as a microphone for the other person's headset).

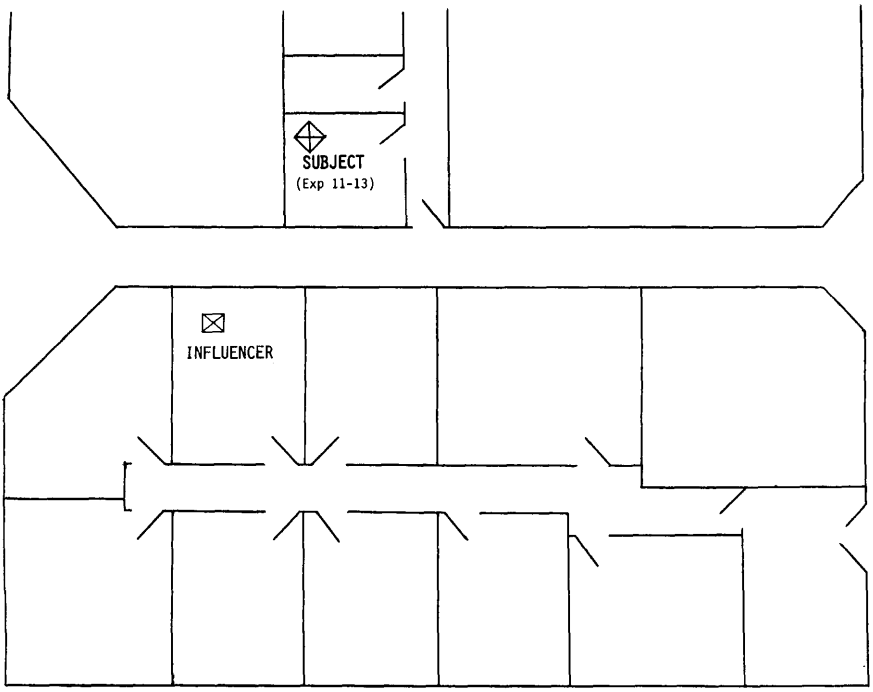

Fig. 2. Laboratory floor plan showing locations of subject and influencer for Experiments 11 through 13; subject and influencer rooms are in separate suites of the same building, separated by an outside corridor and several closed doors.

Subject's Instructions and Activities. Throughout an experimental session, the subject sat in a comfortable armchair in a dimly illuminated, closed room. In Experiments 1 and 3, the subject was exposed to visual and acoustic ganzfeld stimulation throughout the session (see Bertini, Lewis, & Witkin, 1964; Schacter, 1976); this was accomplished by having the subject view a uniform red light field through translucent, hemispherical acetate eye covers while listening to moderately loud white noise through headphones. In Experiments 2 and 4, ganzfeld stimulation was not employed; rather, the subject simply sat quietly in the dim room, with freedom to open or close the eyes as desired. In Experiments 5 through 13, the subject watched randomly changing patterns of colored lights on a 12-inch display screen 2 meters away, while listening to computer-generated random sounds through headphones. The subject was instructed to make no deliberate effort to relax or to become more active, but rather to remain in as ordinary a condition as possible and to be open to and accepting of a possible influence from the distant influencer whom he or she had already met. The subject remained unaware of the number, timing or scheduling of the various influence attempts, and was instructed not to try to guess consciously when influence attempts might be made. The subject was asked to allow his or her thought

processes to be as variable or random as possible and to simply observe the various thoughts, images, sensations, and feelings that came to mind without attempting to control, force, or cling to any of them.

Influencer's Instructions and Activities. The influencer sat in a comfortable chair in front of a polygraph in another closed room. The polygraph provided a graphic analog readout of the concurrent electrodermal activity of the distant subject. For half of each session for Experiment 6, this polygraph was turned off and no feedback was allowed. For all other sessions of all other experiments, polygraph feedback information about the momentary physiological activity of the subject was available to the influencer. The influencer had the option of attending to this polygraph feedback or ignoring it. In most cases, the influencer watched the polygraph tracing throughout a session. In some cases, the influencer closed his or her eyes and ignored the polygraph tracing during the actual 30-second imagery or nonimagery periods (see below), but looked at the tracings following those periods in order to learn of the success or failure of the influence attempts.

An experimental session contained 20 30-second recording periods or epochs. Each epoch was signaled to the experimenter and to the influencer by an auditory signal that could not be heard by the distant subject. Immediately before each signal, the experimenter exposed a card to the influencer. This card contained an instruction for the upcoming epoch. The word "influence" indicated that the next 30-second period was to be an imagery epoch during which the influencer would attempt to influence the distant subject; the word "control" indicated a nonimagery or noninfluence period. The influencer had been instructed beforehand that during each influence period, he or she was to attempt to influence the electrodermal activity of the distant subject through the use of self-generated imagery. In some experiments (Experiments 5, 6, 8, 10 and 11), the goal of the imagery influence attempts was the *calming* of the distant subject—the reduction of the subject's sympathetic autonomic nervous system activity and hence the reduction of the frequency and magnitude of spontaneous skin resistance responses. In other experiments (Experiments 2, 4, and 7), the goal of the imagery influence attempts was the *activation* of the distant subject—an increase in the subject's sympathetic autonomic nervous system activity and hence an increase in the frequency and magnitude of spontaneous skin resistance responses. In still other experiments (Experiments 1, 3, 9, 12 and 13), both calming and activation strategies were used within a single session; in those experiments, there were 10 calm-aim periods and 10 activate-aim periods.

During control periods, the influencer attempted not to think about the subject or about the experiment, and to think of other matters. During influence periods, the influencer used the following strategies (either alone or in combination) in an attempt to influence the somatic activity of the distant subject.

1. The influencer used imagery and self-regulation techniques in order to induce the intended condition (either relaxation or activation, as demanded by the experimental protocol) in *himself or herself,* and imagined (and intended for) a corresponding change in the distant subject.
2. The influencer imagined the *other person* in appropriate relaxing or activating settings.
3. The influencer imagined the desired outcomes of the polygraph pen tracings—i.e., imagined few and small pen deflections for calming periods and many and large pen deflections for activation periods.

There were rest periods, ranging in duration from 15 seconds to 2 minutes in the various experiments, between the 30-second recording epochs. During those periods, the influencer was able to rest and to prepare for the upcoming epoch.

Scheduling of Influence Attempts. In order to eliminate the possible influence of common internal rhythms and to remove the possibility that the influencer and the subject just happened to respond at whim in the same manner and at the same times, it was necessary to *formally assign* to the influencer specific times for engaging in imagery: such assignments had to be truly random and, of course, could not be known to the subject (lest the subject self-regulate his or her own physiology on the basis of such knowledge. in order to confirm the expectations of the experimenter). The subject's blindness with respect to the imagery/nonimagery sequence was maintained by keeping *all* participants (including the experimenter) blind regarding the sequence until preparatory interactions with the subject had been completed and the session was about to begin. Only then, when the subject and the influencer/experimenter team were stationed in their separate rooms, did the experimenter become aware of the proper epoch sequence for that session. In Experiments 1 and 3, the epochs were scheduled in a truly random manner by means of an electronic binary random event generator (see Schmidt. 1970). In Experiments 2 and 4. the epochs were randomly scheduled by means of a set of 20 cards (10 influence and 10 control cards) which were shuffled by the experimenter 20 times before each session. In the remainder of the experiments. the epochs were scheduled in an **ABBA** or **BAAB** sequence: the experimenter learned whether a particular session's sequence was to be **ABBA** or **BAAB** by consulting a sealed envelope immediately before the beginning of each session. The envelopes had been prepared beforehand by someone who had no further role in the experiments. The "preparer" had prepared each session's sequence envelope through the use of a table of random numbers. with the only restriction for its use being the occurrence of equal numbers of **ABBA** and **BAAB** sequences in an experiment. [We used an **ABBA** design in order to minimize possible progressive error in the experiments: such a design allows any progressive error (i.e., the contribution of any extraneous variable which

varies systematically with time) which may have autonomic concomitants to contribute equally to the A and B periods, thus avoiding a biasing contribution to any one condition alone.]

Monitoring of Electrophysiological Activity. The subject's sympathetic autonomic nervous system activity was assessed by monitoring his or her spontaneous skin resistance responses (SRR) on a continuous basis throughout the 20 minutes of an experimental session. In Experiments 1 and 3, SRR activity was recorded by means of silver/silver chloride electrodes (7.0 mm in diameter) with partially conductive electrode gel, attached by adhesive collars to the subject's right palm. Phasic electrodermal activity was recorded by means of a Stoelting Model SA 1473 GSR amplifier and a Stoelting Model 22656 Multigraphic Recorder. Sensitivity was adjusted so that an internal calibrating signal of 1.0 kilohm resulted in a 10.0 mm recording pen deflection. In Experiments 2 and 4, a Lafayette Model 76405 multiplex GSR amplifier was used, along with the Stoelting chart-mover/penwriter described above; chrome-plated stainless steel finger electrodes (each with a surface area of 585 mm^2) without electrode paste were attached to the first and third fingers of the left hand by means of Velcro bands. In Experiments 5, 6, and 7, the Lafayette amplifier was used along with a Harvard Apparatus chart mover and pen writers; the steel/pasteless finger electrodes were attached to the subject's right hand. In Experiments 8 through 13, the Lafayette amplifier and Harvard chart recorder were used, but with silver/silver chloride electrodes and partially conductive gel; electrodes were attached to the subject's right palm. For Experiments 1 through 4, electrodermal activity was evaluated by blind-scoring of pen tracings by someone who had no other role in the experiments.' For Experiments 5 through 13, scoring was automated through the addition of an analog-to-digital converter interfaced with a microcomputer. This equipment sampled the subject's SRR activity 10 times each second for the 30 seconds of a recording epoch and averaged these measures, providing what is virtually a measure of the area under the curve described by the fluctuation of electrodermal activity over time (i.e., the mathematically integrated activity). The computer provided a paper printout of the results at the end of the session. For all experiments, with the exception of Experiment 13, a 5-minute adaptation/habituation period for the subject preceded the actual experimental session. For Experiment 8, other physiological measures were recorded in addition to electrodermal activity *(viz.,* pulse rate, hand temperature, breathing rate, and electromyographic activity of the frontalis muscle group); those measures, however, will not be described in this paper.

Assessment of Physiological Responses. Each session of each experiment yielded 10 assessments of electrodermal (SRR) activity recorded during an influencer's attempts to influence that activity in a specific direction using specific imagery, and 10 assessments of activity recorded in the absence of such attempts. (The sole exception to this occurred in Experiment 13, in

which there was a total of only 12 recording epochs for each session, rather than the usual 20.) Our evaluation of whether the influencer's imagery influenced the subject's somatic activity was carried out on a session-by-session basis, and involved a determination of the proportion of somatic activity in the prescribed direction which occurred during the influence periods, relative to its occurrence during control periods. For each session, we calculated the total activity for that session by summing the SRR scores for all 20 30-second recording epochs (or for all 12 epochs, in the case of Experiment 13). Next, we calculated the activity that occurred during the 10 30-second influence or imagery epochs of a session by summing those 10 scores; separately, we calculated the activity occurring during the 10 30-second control (i.e., noninfluence or nonimagery) epochs of the session by summing those 10 scores. Dividing the influence and control sums, respectively, by the total activity yielded two activity proportions. In the absence of a transpersonal imagery effect (TIE), each of these two proportions would be expected to approximate 0.50; i.e., on the basis of chance alone, half of a subject's total electrodermal activity would be expected to occur during the influence periods and half during the control periods. A significant departure of these proportions from 0.50, in the appropriate predicted direction, would constitute evidence for the presence of a transpersonal imagery effect.

Results

We have completed 13 experiments using the methodology described above. Experiments 1, 2, 3, 4, and 11 were "demonstration studies" conducted to test the effectiveness of the method with different samples of subjects and influencers. In the remaining eight experiments, we sought to' determine how the transpersonal imagery effect might be influenced by various psychological factors. Since our purpose in this paper is to describe the method itself, we shall not present the rationales, details, or specific outcomes of the individual experiments, but will limit our remarks to the common features of the studies and to their overall results.

In each experiment, the primary method of analysis involved a comparison of the proportion of electrodermal activity which occurred during the imagery influence epochs of a session with the proportion expected on the basis of chance alone, i.e., 0.50. Chi-square goodness of fit tests indicated that the distribution of obtained session scores did not differ significantly from a normal distribution; therefore, parametric statistical tests were used for their evaluation. Single-mean *t* tests were used to compare the obtained session scores with an expected mean of 0.50.

Summary statistics for the 13 experiments are presented in Table I.

For experiments (such as Experiments 5 and 13) in which significant differences obtained between different subconditions and/or in cases in which *a priori* decisions had been made to evaluate certain groups separately, scores are presented for each subcondition; otherwise, scores of sub-

TABLE 1
Quantitative summary of transpersonal imagery experiments

Experiment	Influencer(s)	Number of Sessions	Hit Sessions	Mean % Influence	t	p	z	d	Type of Study
1	Experimenter	10	9	9%	3.07	.0065	2.73	.97	Demonstration
2	M. M.	10	8	9%	2.04	.035	1.81	.64	Demonstration
3	10 unselected volunteers	10	8	8%	2.96	.0077	2.42	.94	Demonstration
4	10 unselected volunteers	10	5	−3%	−0.76	.736	−0.63	−.24	Demonstration
5	Experimenters	16	12	10%	2.40	.014	2.20	.60	Need (greater)[4]
5	Experimenters	16	6	0%	−0.09	.537	−0.09	−.02	Need (lesser)[4]
6	24 unselected volunteers	24	17	7%	1.77	.043	1.72	.36	Feedback (within)'
7	Experimenters	32	16	3%	1.15	.13	1.13	.20	Blocking[5]
8	Experimenters	30	15	2%	0.45	.33	0.44	.08	Specificity[5]
9	Experimenters	30	18	1%	0.44	.33	0.43	.08	Direction[6]
10	Experimenters	16	7	3%	1.31	.10	1.28	.33	Magnitude (within)[6]
11	3 healing practitioners	15	9	1%	0.62	.28	0.58	.16	Demonstration (Reiki method)[7]
12	5 selected volunteers	40	19	1%	0.21	.41	0.23	.03	IDS pilot (within)'
13	8 selected volunteers	32	20	7%	2.14	.02	2.08	.38	IDS confirmation single seed (within)[8]
13	8 selected volunteers	32	14	−2%	−0.53	.70	−0.52	−.09	IDS confirmation multiple seeds (within)'

conditions are combined and presented for the experiment as a whole. The number of sessions contributing to each experiment varied from 10 to 40. The single-mean t tests produced independently significant evidence for the transpersonal imagery effect (i.e., an associated p of 0.05 or less) in 6 of the possible 15 cases, yielding an experimental success rate of 40%. The experimental success rate expected on the basis of chance alone is, of course, 5%.

Results for the 13 experiments are presented in another form in Figure 3. For this presentation, we calculated z scores and effect size scores for the overall results of each experiment. The z scores were calculated according to the Stouffer method [see Rosenthal (1984)] which involves converting the studies' obtained p values into z scores, summing these z scores, and dividing 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. For Figure 3, this method was used to provide an overall or combined z score for each of the 13 experiments, for ease of graphical portrayal. The effect sizes shown in Figure 3 are "Cohen d" measures which are recommended by those interested in meta-analyses of scientific experiments [see Cohen (1969); Glass, McGaw, & Smith (1981); Rosenthal (1984)]; the effect sizes

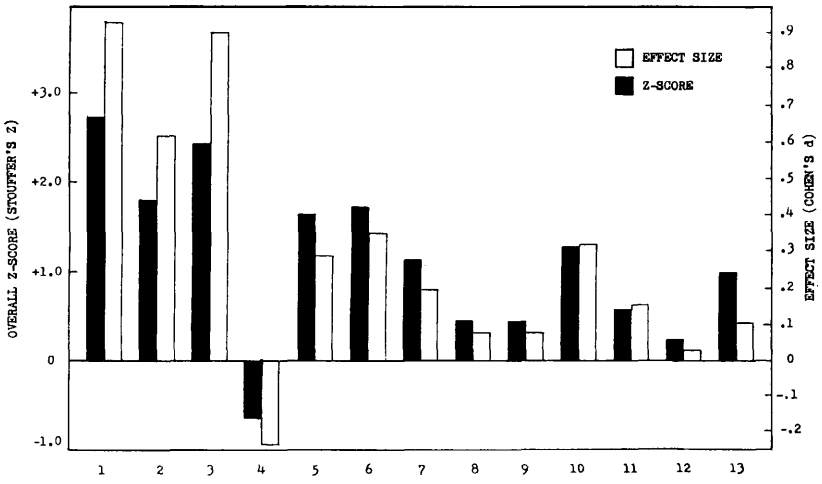

Fig. 3. Overall *z* scores and effect sizes (Cohen's d measures) for the 13 successive transpersonal imagery experiments.

were calculated according to the formula $\boldsymbol{d} = t\sqrt{1/n}$. These effect sizes varied from -0.24 to 0.97, with a mean d = 0.29, and compare favorably with effect sizes typically found in traditional behavioral research.

A global analysis of the 13 experiments is presented in Table 2. There were 15 assessments of the transpersonal imagery effect. Contributing to those assessments were 323 sessions conducted with 271 different subjects, 62 influencers, and 4 experimenters. Six of the 15 assessments (40%) were independently significant statistically ($p < .05$); this is to be compared with the 5% experimental success rate expected by chance. Fifty-seven percent of the sessions were successful (i.e., these were sessions in which the influence imagery epochs accounted for more than 50% of the subject's electrodermal activity during activation attempts and less than 50% of the total activity during calming attempts); this is to be compared with the 50% session success rate to be expected on the basis of chance. The overall mean magnitude of the TIE for all experiments differed from chance expectation by 3.73%; when only the six independently significant experiments are considered, the obtained mean TIE had a magnitude of 8.33%. The two most important entries of Table 2 are the combined *z* score (for the experimental series as a whole, calculated according to the Stouffer method) and the mean effect size (Cohen's d, for the entire series). The overall *z* is 4.08 and has an associated p = ,000023; the average effect size for all 13 experiments is 0.29.

Inspection of Table 1, Figure 3, and Table 2 indicates that the effect occurring in these 13 experiments is a relatively consistent, replicable, and robust one. It should also be pointed out that, in terms of its magnitude, the effect is not a negligible one. Under certain conditions, the transpersonal imagery effect can compare favorably with an imagery effect upon one's

TABLE 2
Summary statistics for transpersonal imagery experiments

Total Experiments	Psi Assessments	Number of Sessions	Number of Subjects	Number of Influencers
13	15	323	271	62

Successful Studies	Successful Sessions	Mean Percent Influence		Combined z	Overall p	Mean Effect Size (d)
		All	Successful			
6/15 (40%) (MCE = 5%)	183/321 (57%) (MCE = 50%)	3.73%	8.33%	4.08	.000023	.29

own physiological activity. Although it is not reviewed in this paper, an autonomic self-control experiment was conducted immediately following Experiment 5. In the self-control study, volunteer subjects attempted to calm themselves using relaxing imagery during 10 30-second periods, and their SRR activity during those periods was compared with activity levels during 10 interspersed nonimagery control periods. The strength of the self-control imagery effect in that study (an 18.67% deviation) did not differ significantly from the strongest transpersonal imagery effect of Experiment 5 (a 10% deviation).

Discussion

The results of this series of 13 experiments indicate that the present methodology is effective for the objective assessment of transpersonal imagery effects. It was demonstrated that the psychophysiological activity of one person varied, to a significant degree, with the imagery content of another person. The experimental design guaranteed that the effect could not be attributed to conventional sensorimotor cues, common external stimuli, common internal rhythms, or chance coincidence. A number of additional potential artifacts can be mentioned here and can be effectively dismissed.

1. The findings are the result of recording errors and motivated misreadings of polygraph records. This explanation is rejected on the basis of blind-scoring of polygraph records (see Figure 4 for sample record) and, later, by the use of completely automated assessment techniques and computer-scoring of response activity.

2. The subjects knew beforehand when influence attempts were to be made and "cooperated" by changing their own autonomic activity when appropriate. This explanation may be rejected because the subjects were not told when or how many influence attempts would be made, nor was the experimenter aware of the influence/control epoch schedule until all preliminary

Fig. 4. Sample of polygraph tracing of electrodermal activity.

interactions with the subject had been completed. Subjects did not know of the existence of, or have access to, the envelopes containing schedule information.

3. Subjects could have become aware during the experimental sessions themselves of when influence epochs were in progress and could have altered their own physiological reactions during those periods. This possibility was eliminated by isolating the subject from any such cues from the influencer. Subject and influencer were in separate, closed rooms at least 20 meters apart. No auditory cues could have impinged upon the subject to indicate when recording epochs were in progress or whether such epochs were influence or control periods. Neither the influencer nor the experimenter made any vocalizations that could have informed the subject about whether influence or control periods were in progress. The epoch-indicating tones heard by the influencer and experimenter, and the random tones heard by the subject, were provided by independent audio systems which eliminated the possibility of electrical crosstalk and also the possibility of headphones functioning as microphones and inadvertently cueing the subject.

4. Differences in autonomic activity between influence and control periods are due to systematic error—i.e., some progressive change in electrodermal activity over time. This objection may be rejected. Progressive (time-based) errors could have been contributed by (a) changes in equipment sensitivity as the equipment warmed up, (b) changes in electrodermal activity due to adaptation or habituation to the experimental environment, or (c) changes in electrodermal activity due to polarization of the recording electrodes. Equipment was allowed to warm up for 15 to 20 minutes prior to the beginning of a session and therefore had become thermally stable before the experiment began. The use of electrodes with large surface areas, and the use of a constant-current electrodermal recording device reduced the possibility of polarization problems. The use of silver/silver chloride electrodes and partially conductive paste in other experiments further minimized a polarization problem. A special analysis of the data from Experiment 5 is relevant to the habituation question. Statistical evaluation of total electrodermal activity for the first halves *versus* the second halves of the sessions indicated no evidence of an habituation effect. This absence of habituation could be

attributed to the use of an adaptation period before the actual recording session began, and to the use of constantly changing auditory and visual stimulation of the subject (i.e., the use of the random tones and colored lights display). Thus, there was no progressive change in electrodermal activity due to any of the three possible processes mentioned above. However, even if a progressive change had occurred, the use of the **ABBA** counterbalanced design and the use of truly random influence/control sequencing in other experiments would have prevented this error from contributing differentially to influence *versus* control epochs.

5. *The findings are due to arbitrary selection of data.* This explanation may be rejected since total numbers of subjects and trials were prespecified, and the analyses reported include all recorded data.

6. *The results are due to fraud on the part of the subjects.* This explanation may be rejected. The subjects were unselected volunteers; it may be assumed that such subjects had no motive for trickery. However, even if a subject were motivated to cheat, such an opportunity was not present. Cheating would have required knowledge of a session's influence/control epoch sequence and of the precise starting time for the session, or the assistance of an accomplice. Both of these requirements were eliminated.

7. *The results are due to fraud on the part of the experimenters.* No experiment, however sophisticated, can ever be absolutely safe from experimenter fraud. Even if an experiment were controlled by an outside panel of disinterested persons, a hostile critic could still argue that collusion was involved. The imagined extent of such a conspiracy would be limited only by the imagination and degree of paranoia of the critic. We can only state that we used multiple-experimenter designs so that one experimenter's portion of the experiment served as a kind of control for another experimenter's portion. Only the successful replication of these findings by investigators in other laboratories would reduce experimenter fraud to a non-issue. We hope that this report will stimulate such replication attempts.

We conclude that our results cannot be attributed to any of the various potential artifacts or confounds mentioned above, and therefore are not spurious. Rather, the results reflect an anomalous psychophysical interaction between two individuals separated from one another in space.

A Range of Reactions

In addition to responding physiologically in a manner consistent with the imagery of the distant influencer, subjects often reported subjective responses which corresponded to the influencers' images. Sometimes these reports were of relatively vague feelings of relaxation or activation. However, there were also reports of extremely *specific* thoughts, feelings, and sensations which strikingly matched the imagery employed by the influencer. For example, a subject reported spontaneously that during the session he had a very vivid impression of the influencer coming into his

room, walking behind his chair, and vigorously shaking the chair; the impression was so strong that he found it difficultto believe that the event had not happened in reality. This session was one in which the influencer had employed just such an image in order to activate the subject from afar.

Subjects sometimes spontaneously reported mentation which corresponded closely to that of the influencer or the experimenter, even when that mentation was incidental and not employed consciously as part of an influence strategy. For example, at the beginning of one session, the experimenter remarked to an influencer that the electrodermal tracings of the subject were very precise and regimented and that they reminded him of the German techno-pop instrumental musical group, Kraftwerk. When the experimenter went to the subject's room at the end of the session, the subject's first comment was that early in the session, for some unknown reason, thoughts of the group Kraftwerk had come into her mind. The subject could not have overheard the experimenter's earlier comment to the influencer. Such correspondences were not rare.

There appeared to be a continuum of reactions possible for the subject. At one extreme, there would be no resemblance whatsoever between the imagery of the influencer and the imagery and physiological reactions of the subject. Next on the continuum would be cases in which autonomic reactions occurred which were appropriate to the influencer's imagery, but the subject was completely unaware of those reactions. Next were appropriate physiological reactions of which the subject was only vaguely aware, and next would be reactions accompanied by very definite subjective experiences. Closer to the "resemblance" end of this continuum would be cases of reactions accompanied by images in the subject which were virtually identical to those of the influencer. Even closer to the resemblance end would be cases of appropriate electrodermal activity, quite similar imagery, plus behavioral and/or gross physical changes consistent with the influencer's imagery. An example of the latter occurred in a subject who experienced a dramatic reddening of the face and neck during a session. Other subjects experienced muscle tremors, tingling of body parts, awareness of a pounding heart and rushing blood, a felt need to take deep breaths, decreased awareness of body parts, etc. Although our overall statistical findings leave no doubt that the subjects' recorded autonomic reactions were in fact related to the imagery of the influencers, such certainty is not possible in the case of these subjective or physical reactions, since no time-correlated records of those latter reactions were kept. Some of the physical symptoms observed may simply have been bodily conditions that were present all along, but which were brought to the subjects' awareness more forcefully during the experimental sessions due to the demand characteristics of the study. However, some reactions may have been directly influenced or even brought about by the influencers' imagery. We intend to pursue this issue more analytically in future studies in which the temporal distribution of such reactions will be monitored by having subjects verbalize their reactions as they are occurring, or indicate unusual or noteworthy feelings by pressing a

button that will mark an event channel of the polygraph. This will allow a determination of whether particular experiences or reactions of subjects are "time-locked" to specific images used by influencers during the sessions. A similar monitoring of the details of the influencers' imagery would permit a determination of the most and least effective forms of imagery, and could teach us a great deal about the varieties and manifestations of transpersonal imagery.

Some Preliminary Findings

We indicated earlier that we did not intend to describe specific details of the various 13 experiments in this paper. However, it does seem appropriate to mention some of our preliminary findings and tentative conclusions at this point.

1. The transpersonal imagery effect (TIE) is a relatively reliable and robust phenomenon; this conclusion is based upon overall statistical results.
2. The magnitude of the effect is not trivial, and under certain conditions it compares favorably with the magnitude of a self-regulation effect.
3. The ability to manifest the effect is apparently widely distributed in the population. Sensitivity to the effects appears to be normally distributed among the 271 volunteer subjects tested in these experiments. Altogether, 62 different influencers were able to produce the effect, with varying degrees of success. Many persons were able to produce the effect, including unselected volunteers attempting it for the first time. More practiced individuals seem able to produce the effect more consistently. There are indications of improvements with practice for some influencers.
4. The TIE can occur at a distance, typically 20 meters; greater distances have not yet been explored.
5. Subjects with a greater need to be influenced (i.e., those for whom the influence is more beneficial) seem more susceptible to the effect.
6. Immediate, trial-by-trial analog sensory feedback is not essential to the occurrence of the effect; intention/visualization of the desired outcome is effective.
7. The TIE can occur without the subject's knowledge that such an influence is being attempted.
8. It may be possible for the subject to block or prevent an unwanted influence upon his or her own physiological activity; psychological shielding strategies in which one visualizes protective surrounding shields, screens, or barriers may be effective.[2]
9. Generally, our volunteer participants have not evidenced concern over the idea of influencing or being influenced by another person.
10. The TIE may generalize to other physiological measures (such as heart rate), but the effect may also be intentionally focused or restricted to one of the number of physiological measures.[3]

11. The TIE does not always occur. The reasons for the absence of a significant effect in some experiments of a series which is otherwise successful are not clear. We suspect that the likelihood of a successful TIE may depend upon the presence of certain psychological conditions, in both influencer and subject (and perhaps even in the experimenter), which are not always present. Possible success-enhancing factors may include belief, confidence, positive expectation, and appropriate motivation. Possible success-hindering factors may include boredom, absence of spontaneity, poor mood of influencer or subject, poor interactions or poor rapport between influencer and subject, and excessive egocentric effort (excessive pressure or striving to succeed) on the part of participants. We suspect that the effect occurs most readily in subjects whose nervous systems are relatively "labile" (i.e., characterized by free variability) and are momentarily free from external and internal constraints. Perhaps fullness of intention and intensity or vividness of visualization in the influencer facilitate the effect.

Additional research is needed to determine the validity of these conclusions, and to explore more thoroughly the various physiological and psychological factors which are favorable or antagonistic to the occurrence of the TIE.

Implications and Applications

The methodology employed in these experiments reveals that, under certain conditions, mental imagery does indeed have a transpersonal aspect. The results suggest a fundamental inter-connectedness among people through which the transpersonal imagery effect may be mediated. The findings provide an additional illustration of the power of the imagination. The method extends research possibilities for the further laboratory study of imagery, transpersonal functioning, psychic functioning, emotional contagion, and other related processes.

If the effects of transpersonal imagery prove to be sufficiently strong and robust, it is not inconceivable that the phenomenon could be practically applied. Possible applications include the use of transpersonal imagery as an adjunct in medical and psychological healing practices; as an aid in therapy, counseling, and training for biofeedback, hypnosis, and meditation; and as an additional educational tool. Each of the processes just mentioned could conceivably be facilitated in one person (the learner or client) if appropriate and powerful images are held concurrently in the mind of another person (the teacher or therapist).

We hope this presentation of our methodology and preliminary findings will prompt other researchers and practitioners to conduct further experimental, theoretical, and applied investigations of the important but relatively ignored phenomenon of transpersonal imagery.

Endnotes

[1] The scorer measured, to the nearest millimeter, the amplitudes of all skin resistance responses greater than 2 mm. The amplitudes of all reactions during a 30-second epoch were summed, yielding a total SRR activity score for that period. This was done for each of the 20 30-second trial epochs. The trial sequence was then decoded and the SRR activity was summed for the 10 control and for the 10 influence periods. The scorer, of course, had been blind during the measurement phase.

[2] This tentative conclusion derives from certain segments of Experiment 7; the reader should consult Braud, Schlitz, Collins and Klitch (1985) for details.

[3] This tentative conclusion derives from certain segments of Experiment 8; see Braud, Schlitz, Collins and Klitch (1985) for further details.

[4] In Experiment 5, we studied the influence of the strength of "need" or motivation; for further details see Braud and Schlitz (1983).

[5] For additional information about Experiments 6, 7, and 8, see Braud, Schlitz, Collins and Klitch (1985).

[6] In Experiment 9, we sought to determine whether increments or decrements in SRR activity might be easier to produce via distant mental influence; in Experiment 10, we sought to determine whether the magnitude of a distant mental influence effect could be self-modulated by the influencer. Detailed results of these experiments will be published at a later date.

[7] The influencers for Experiment 11 were practitioners of a Reiki healing method; see Schlitz and Braud (1985) for details.

[8] Experiments 12 and 13 were conducted to examine the possible role of "intuitive data sorting" (IDS) in these experiments; details may be found in Braud and Schlitz (1988).

References

Achterberg, J. (1985). *Imagery in healing.* Boston: New Science Library.

Angoff, A., & Barth, D. (1974). *Parapsychology and anthropology.* New York: Parapsychology Foundation.

Bertini, M., Lewis, H., & Witkin, H. (1964). Some preliminary observations with an experimental procedure for the study of hypnagogic and related phenomena. *Archivo di Psicologia Neurologia e Psychiatria, 6,* 493–534.

Borelli, M., & Heidt, P. (Eds.). (1982). *Therapeutic touch: A book of readings.* New York: Springer Publishing Company.

Braud, W., & Schlitz, M. (1983). Psychokinetic influence on electrodermal activity. *Journal of Parapsychology, 47,* 95–119.

Braud, W., & Schlitz, M. (1988). Possible role of intuitive data sorting in electrodermal biological psychokinesis (bio-PK). In D. Weiner & R. Morris (Eds.), *Research in parapsychology 1987* (pp. 5–9). Metuchen, NJ: Scarecrow Press.

Braud, W., Schlitz, M., Collins, J., & Klitch, H. (1985). Further studies of the bio-PK effect: Feedback, blocking, specificity/generality. In R. White & J. Solfvin (Eds.), *Research in parapsychology 1984* (pp. 45–48). Metuchen, NJ: Scarecrow Press.

Cohen, J. (1969). *Statistical power analysis for the behavioral sciences.* New York: Academic Press.

Dean, E. (1966). Plethysmograph recordings as ESP responses. *International Journal of Neuropsychiatry, 2,* 439.
Dingwall, E. (Ed.). (1968). *Abnormal hypnotic phenomena.* London: Churchill. 4 vols.
Duane, T., & Behrendt, T. (1965). Extrasensory electroencephalographic induction between identical twins. *Science,* 150, 367.
Edge, H., Morris, R., Palmer, J., & Rush, J. (1986). *Foundations of parapsychology.* Boston: Routledge & Kegan Paul.
Ehrenwald, J. (1977). Parapsychology and the healing arts. In B. Wolman (Ed.), *Handbook of parapsychology* (pp. 541–556). New York: Van Nostrand Reinhold.
Glass, G., McGaw, B., & Smith, M. (1981). *Meta-analysis in social research.* Beverly Hills, CA: Sage Publications.
Hall, H. (1984a). Imagery and cancer. In A. Sheikh (Ed.), *Imagination and healing* (pp. 159–170). Farmingdale, NY: Baywood Publishing Company.
Hall, H. (1984b). Hypnosis, imagery and the immune system: A progress report three years later. Paper presented at the 36th Annual Convention of the Society for Clinical and Experimental Hypnosis, San Antonio, Texas.
Hall, H. (1987). Imagery in the treatment of life-threatening illness. Paper presented at the 2nd World Conference on Imagery, Toronto, Ontario, Canada.
Honorton, C. (1974). Psi-conducive states of awareness. In E. Mitchell (J. White, Ed.), *Psychic exploration: A challenge for science* (pp. 616–638). New York: Putnam.
Honorton, C. (1977). Psi and internal attention states. In B. Wolman (Ed.), *Handbook of parapsychology* (pp. 435–472). New York: Van Nostrand Reinhold.
Krieger, D. (1979). *The therapeutic touch: How to use your hands to help or to heal.* Englewood Cliffs, NJ: Prentice-Hall.
Krippner, S. (Ed.). (1977). *Advances in parapsychological research, Volume* 1: *Psychokinesis.* New York: Plenum.
Krippner, S. (Ed.). (1978). *Advances in parapsychological research, Volume 2: Extrasensory perception.* New York: Plenum.
Krippner, S. (Ed.). (1982). *Advances in parapsychological research, Volume* 3. New York: Plenum.
Krippner, S. (Ed.). (1984). *Advances in parapsychological research, Volume* 4. Jefferson, NC: McFarland & Company.
Kunz, D. (Ed.). (1985). *Spiritual aspects of the healing arts.* Wheaton, IL: Quest.
Long, J. (Ed.). (1977). *Extrasensory ecology: Parapsychology and anthropology.* Metuchen, NJ: Scarecrow Press.
Nash, C. (1986). *Parapsychology: The science of psiology.* Springfield, *IL:* Charles C Thomas.
Peavey, B. (1982). Biofeedback-assisted relaxation: Effects on phagocytic immune functioning. Unpublished doctoral dissertation, North Texas State University, Denton, Texas.
Puthoff, H., & Targ, R. (1976). A perceptual channel for information transfer over kilometer distances: Historical perspective and recent research. *Proceedings of the IEEE,* 64, 329–354.
Rosenthal, R. (1984). *Meta-analytic procedures for social research.* Beverly Hill, CA: Sage Publications.
Schacter, D. (1976). The hypnagogic state: A critical review of the literature. *Psychological Bulletin,* 83, 452–481.
Schlitz, M., & Braud, W. (1985). Reiki-plus natural healing: An ethnographic/experimental study. *Psi Research,* 4, 100–121.
Schmidt, H. (1970). Quantum-mechanical random-number generator. *Journal of Applied Physics,* 41, 462–468.
Schneider, J., Smith, C., & Whitcher, S. (1984). The relationship of mental imagery to white blood cell (neutrophil) function: Experimental studies of normal subjects. Paper presented at the 36th Annual Convention of the Society for Clinical and Experimental Hypnosis, San Antonio, Texas.
Solfvin, J. (1984). Mental healing. In S. Krippner (Ed.), *Advances in parapsychological research, Volume* 4 (pp. 31–63). Jefferson, NC: McFarland and Company.
Targ, R., & Puthoff, H. (1974). Information transfer under conditions of sensory shielding. *Nature,* 252, 602–607.
Van de Castle, R. (1977). Parapsychology and anthropology. In B. Wolman (Ed.), *Handbook of parapsychology* (pp. 667–686). New York: Van Nostrand Reinhold.
Wolman, B. (Ed.). (1977). *Handbook of parapsychology.* New York: Van Nostrand Reinhold.