On the Use of Living Target Systems in Distant Mental Influence Research

by William Braud

The more it moves, the more it yields.

- Lao Tsu

For several years, my co-workers and I have been exploring the use of living target systems in our research on distant mental influence. We have found that living systems possess many characteristics that make them exceedingly attractive and useful to the psi researcher. I would like to share with you some of my thoughts about the positive features of such systems and their many advantages for psi research in all of its aspects--experimental, theoretical, and practical.

The Theme...and its Variations

In a typical experiment of the type to be discussed, one selects a living organism and isolates it, usually at a distance, from all conventional sensori-motor or energetic influences of the "influencer." In principle, any living organism may serve as this "target." Next, one selects some readily measured aspect of the target organism's activity, objectively monitors that activity over a period of time, and generates a permanent record of that activity. It is, perhaps, desirable to choose an activity which occurs with moderate frequency or intensity and which is relatively stable over time, although this is not an essential requirement. An "influencer" then attempts to influence the organism's activity, mentally and at a distance, in a prescribed fashion and according to a predetermined (and, ideally, random) schedule. Conventional statistical methods are used to compare the organism's activity

during periods of attempted mental influence with activity levels during comparable non-influence, control periods.

The procedure may be illustrated more concretely by an experimental technique that we have used over 300 times in our laboratory. A subject sits in a quiet, comfortable room for approximately 25 minutes while his or her sympathetic autonomic activity is continuously assessed by computer-monitoring of the subject's electrodermal activity (EDA). In another room, typically 20 meters away, an influencer attempts to mentally "calm" the distant subject during ten 30-second influence periods but not during ten interspersed control periods. Total EDA during the influence periods is compared statistically with total EDA during the control periods in order to determine whether the experiment was successful.

This is merely the latest version of an experimental procedure for which there is a long and interesting history. Some of the earliest variations of the paradigm occurred in the contexts of "animal magnetism," "mesmerism," and hypnosis. As early as 1775, Franz Anton Mesmer described informal experiments in which he claimed successful action-at-a-distance effects, explaining them in terms of propagations in a "universal fluid" connecting all things (Mesmer, 1775, 1779, 1799). Similar distance and nonsensory effects were reported to occur in the *somnambules* of Amand-Marie-Jacques de Chastenet, Marquis de Puysegur, one of the chief French disciples of Mesmer. According to Puysegur, his "artificial somnambulism" effects, which he published in his 1784 memoires, depended importantly upon the mesmerist's firm belief, faith, and confidence in his own powers, and in his strong wanting or willing of the desired effects. Distant "mesmeric" effects were reported by James Esdaile (1852) in India, and by John Elliotson (1843) and Chauncey Hare Townshend (1844) in England.

Perhaps the best known, and best controlled, of these early distant

influence attempts were the remarkable *le sommeil a distance* experiments carried out in Le Havre in 1885 and 1886 by Joseph Gibert and Pierre Janet with the special subject, Leonie B. (Janet, 1886a, 1876b), some of which were witnessed by psychical researchers Frederic W. H. Myers, Charles Richet, and Julian Ochorowicz. Richet (1888) later reported his own similar successful experiments with Leonie and with other subjects. P. Joire (1897), in Lille, conducted experiments on mental suggestions of specific motor acts.

Between 1920 and 1922, the once heralded but now, unfortunately, neglected experiments of Brugmans, Heymans and Weinberg were conducted at the University of Groningen in the Netherlands. These experiments, which involved distant mental influence of motor actions in a special subject, A. S. van Dam, have been re-assessed by Schouten and Kelly (1978).

Controlled experiments were conducted at the Institute for Brain Research of the University of Leningrad in an attempt to determine whether complex motor acts in dogs (specially trained for "will-less" obedience) could be influenced by mental suggestion in the absence of sensory cues. The subjects for these experiments, which yielded suggestive but not entirely satisfactory results, were the trained dogs of Vladimir Durov, a celebrated circus clown and dog trainer; the experimenters were the respected reflexologists, Vladimir M. Bechterev (1920) and A. G. Ivanov-Smolensky (1920).

Between 1921 and 1938, the mental influence research at the Institute for Brain Research shifted its emphasis from dogs to humans, and experiments were carried out, primarily under the direction of Leonid L. Vasiliev, which constitute what is perhaps the most impressive, systematic research on distant mental influence ever to be conducted. Vasiliev and his colleagues found positive evidence that "sleeping" and "waking," swaying, and a variety of motor reactions could be mentally influenced from a distance. A complete account of these experiments was not published until 1962 (Vasiliev, 1962).

This book was translated into English, under the aegis of C. C. L. Gregory and Anita Kohsen (Gregory), and published in 1963 under the title, *Experiments in Mental Suggestion*. A revised edition appeared in 1976 as *Experiments in Distant Influence*.

It is noteworthy that in each and every instance of the research reviewed thus far, distant mental influence was attempted *only with special subjects*. The "hypnosis at a distance" trials were carried out with subjects who were already known to be especially susceptible to hypnotic influence, and the dogs studied in Leningrad had been specially trained, beforehand, for "will-less" obedience.

Following a hiatus of about a decade, additional reports of distant mental influence began to appear. These experiments almost inevitably involved the distant mental influence of more "primitive" biological systems and were typically carried out in two new contexts: psychokinesis and healing. These investigations now become too numerous to be mentioned individually. Fortunately, they have been well reviewed by Solfvin (1984) and by Benor (1984, 1985, 1988). Both selected and unselected participants attempted to mentally influence the growth or viability of bacteria, fungus colonies, yeast, and plants or to influence the movements of protozoa, larvae, woodlice, ants, chicks, mice, rats, gerbils, and cats. Some experiments involved attempts to influence cellular preparations (blood cells, neurons, cancer cells) or enzyme activity.

A very small number of researchers continued to conduct human influence experiments in the French and Russian traditions. Douglas Dean (1964) reported successful attempts to influence the direction of eye movements (recorded electrophysiologically) in dreaming "target persons." Hiroshi Motoyama (1977) reported successful attempts by one person to influence physiological activities (EDA, plethysmographic activity, respiration) of

another person while the two persons were isolated in separate, lead-shielded rooms. In our own laboratory, we have observed successful distant mental influences by one person of the EDA, pulse rate, muscular tremor, ideomotor activity, and mental imagery of another person when deliberate attempts were made to influence these specific reactions (Braud, Davis, & Wood, 1979; Braud & Jackson, 1982, 1983; Braud and Schlitz, 1988). Elmar Gruber (1979, 1980) reported successful attempts to influence the locomotor behaviors of "target persons." Jule Eisenbud (1983) reported the tantalizing results of his attempts to issue mental commands for distant individuals to telephone him.

Of relevance to the mental influence theme are those investigations in which physiological reactions were used as psi indicators--e.g., Dean's (1962) plethysmography studies, Tart's (1963) EEG and GSR studies, the EEG influence studies of Lloyd (1973) and of Targ and Puthoff (1974), etc. Reviews of these studies may be found in Beloff (1974), Millar (1979), Morris (1977), and Tart (1963).

This brief survey was presented in order to indicate the range of phenomena to be addressed in this paper. Common to all of the observations is an influence by one person upon another person (or upon another living system). A number of terms have been offered as descriptions (or, unfortunately, even as explanations) of these interactions. When the experimental outcome involved symptoms of hypnosis, the terms "le sommeil a distance" and "telepathic hypnotisation" naturally suggested themselves. When hypnosis was no longer the desired outcome, those terms gave way to "telepathy at a distance" or "active agent telepathy." "Telergy" and "living target psychokinesis" followed in the wake of PK experimentation. Rex Stanford (1974) suggested "mental or behavioral influence of an agent (MOBIA)." In our own work, we first suggested the term "allobiofeedback" (see Braud, 1978), since, in our initial experiments, one person received feedback for an

attempted biological influence of another person. We subsequently observed that the provision of feedback was not necessary to the occurrence of the effect and coined the term "bio-psychokinesis (bio-PK)" to describe what we were interpreting as psychokinetic influences upon living systems (see Braud and Schlitz, 1983). In presenting this work at an international conference devoted to imagery (Braud and Schlitz, 1987), we used the term "transpersonal imagery effect," following the lead of psychologist Jeanne Achterberg (1985) who suggested "transpersonal imagery" for a possible effect upon one person of the imagery of another. However, imagery does not seem to be required for the effect; non-imagistic intention may suffice. Hence, I considered "transpersonal imagery or intentionality effect" (Braud, 1987). This term is much too cumbersome, and I am abandoning it in favor of the much more straightforward "distant mental influence," which seems to convey the essence of the interaction with minimal surplus meaning. In a later section of this paper, I shall consider in more detail the various processes or mechanisms that might underlie these phenomena.

ADVANTAGES

I shall discuss four important advantages of using living target systems in distant mental influence research.

o The findings of research with living target systems potentially have great *relevance* to important and meaningful human processes such as healing and social influence.

o *Motivation* is heightened in participants in living target experiments.

o Distant mental influence of living systems has a certain *plausibility* that experiments on influence of inanimate systems do not possess.

o Living systems may be particularly *appropriate* as detectors of psi influence.

Relevance

The findings of distant mental influence research with living target systems may have important implications for healing and for social influence. If arbitrarily selected physiological processes of living organisms can be influenced mentally in an arbitrary manner in experimental contexts, does this not suggest that, in principle, similar mental influences could be directed to bodily organs, tissues, or cells in a manner favorable to health and well-being? If behavioral tendencies can be influenced in the laboratory, does this not suggest that decisions, behaviors, and social actions could be influenced psychically in everyday life? There are a number of "pathways" through which distant mental influence might bring about healing or other practical effects.

1. Physiological or biochemical processes in one person might be directly influenced by another person. Such an influence could correct an imbalanced or dis-eased process or could forestall possible medical problems.

2. The mental influence of one person might trigger the self-healing capabilities of another person; the influence might instill in the latter an awareness of a problem, an increased wish to initiate or increase self-healing, or simply provide an opportunity to engage in more efficient self-healing.

3. The mental influence might provide increased motivation for self-healing through instilling greater feelings of self-worth, increased knowledge of reasons for self-healing, or simply an increased awareness that significant others truly desire and expect one's improvement.

4. Conceivably, distant mental influence could remove physical or psychological impediments to the physical healing process.

5. Especially in situations in which two or more decisions have approximately the same likelihood, a distant mental influence could bias the

decision-making process toward or away from one of the choices. Such processes as walking or driving patterns, purchasing behavior, voting tendencies, and so on might be influenced in this way. The consequences of such influenced decisions could be trivial or profound.

6. Paradoxically, distant mental influence could be used to instill or strengthen attitudes of self-responsibility or internal locus of control which could minimize the subsequent suggestive influences of others. This would be analogous to hypnotizing someone, then suggesting that he or she could no longer be hypnotized.

7. Distant mental influence conceivably could influence the accessibility of memories, alter perceptions, feelings, or the timing and sequencing of actions; such alterations could, in turn, have trivial or profound individual or social effects.

Motivation

The motivation to succeed in living target distant influence experiments is likely to be greater than would be the case in inanimate target experiments. To many people, living targets themselves would appear more interesting or appealing than inanimate targets. The implications of success might be clearly or dimly perceived, and, provided such imiplications are not construed as threatening, this knowledge could heighten motivation in subjects and experimenters alike. Motivation would be especially enhanced if the experiment were conducted in a psychic healing context, since the benefits or implications of success would be readily apparent. The perceived relevance of a living target experiment immediately would endow it with meaningfulness and importance and lift it far above its possible consideration as a mere laboratory game or curiosity.

Plausibility

In discussing the plausibility of living target studies, we may

distinguish two types of plausibility: (a) plausibility to the subject, and (b) theoretical plausibility.

Subject plausibility. All of us have had considerable experience in influencing living systems through ordinary means. We continually influence other people and animals through our words and actions. We are aware that we can influence our muscular movements, breathing, feelings, and perhaps even our autonomic reactions through volition, imagery, and the generation of specific kinds of thoughts. We have heard that bodily control may be enhanced through hypnosis, biofeedback, and meditation. We are familiar with the notion that people can become aware of being stared at by an unseen person and may even have personally experienced this phenomenon. Our families, our friends, and the media have exposed us to the notion of telepathic influence. Given these sorts of experiences, the prospect of mentally influencing another person or an animal in a psi experiment does not seem excessively alien or implausible.

We do not have such a network of supporting experiences in the case of awareness or influence of inanimate objects, and it is not surprising that we would be filled with feelings of confusion, uncertainty, doubt, and pessimism when confronted with the task demands of clairvoyance or inanimate target PK experiments. To the extent that attitudes influence psi performance, living target experiments would be expected to have advantages over inanimate target experiments.

Theoretical plausibility. To paraphrase George Orwell, all psi tasks are impossible, but some are more impossible than others. The simple exercises of wiggling our fingers or reviving specific memories will convince us that our minds influence our own brains. We have no genuine understanding of how these mind-body interactions come about. They are impossible. Nonetheless, they happen all the time, and their familiarity has pushed far from our awareness

any disturbing thoughts or concerns about their impossibility. If my mind can influence my own brain, perhaps it can influence other, similar brains as well, even if those similar brains are outside of my physical body. Stated somewhat differently, if my mind can influence my brain while the latter is inside of my skull, perhaps my mind can continue to influence this neural tissue *or similar biological material* even if the latter is removed and maintained outside of my skull or body. Further, the degree to which my mind can continue to exert its influence on a distant target system may depend upon the similarity of that system to my familiar brain. On the basis of theoretical speculations such as these, distant mental influence of living targets becomes more plausible than the influence of inanimate systems. Could the same process underlie both familiar volitional actions (such as muscular movements and memory constructions) and the less familiar volitional actions that we know as "psychokinesis"?

This idea is not a novel one; it has been advanced on several occasions in the history of psychical research. Louisa Rhine (1970) and John Beloff (1979) presented the idea as it was formulated in the 1940s and 1950s by J. B. Rhine (1943, 1947), Thouless and Wiesner (1946, 1947), and J. C. Eccles (1953). Rhine and Thouless were seeking to understand the place in nature of the PK "force" or process which had just been demonstrated by the freshly reported dice-influence experiments; Eccles was attempting to develop a neurophysiological explanation of the action of the will. D. Scott Rogo (1980) reminded us that the idea of PK as a "force" that normally regulates events within the body had been proposed as early as 1909 by Hereward Carrington. Carlos Alvarado (1981) traced the idea back to 1874 and to Serjeant-at-Law E. W. Cox, the pre-S.P.R. psychical researcher who assisted William Crookes in the latter's investigations of the "psychic force" (a term coined by Cox) exhibited in physical mediumship. The following sampling

conveys the flavor of these thoughts on the possible identity of PK and "ordinary" volition.

o John Beloff (1979): "...can PK be regarded as the extra-somatic (and hence paranormal) extension of what, in ordinary volutional activity, is endosomatic (and hence normal)?" (p. 99)

o Evan Harris Walker (1975): "...the action of the consciousness to secure the collapse of the state vector has the physical consequence of determining the subsequent states of that system in a manner that corresponds to the concept of the 'will'....Since the brain is responding to sensory input from events external to the body, physically the brain is tied to and is thus a part of a larger physical system incorporating the external world. Whichever state the brain goes into, it must be one consistent with the state the external world... enters. As a result, specification of the w [will] variables can effect a change in the state of both the brain and events external to the body." (p.8,9)

o John Eccles (1953): "...a special property...is exhibited by the dynamic patterns of neuronal activity that occur in the cerebral cortex during conscious states, and the hypothesis is developed that the brain by means of this special property enters into liaison with mind, having the function of a 'detector' that has a sensitivity of a different kind and order from that of any physical instrument...at any instant the 'critically poised neurones' would be the effective detectors and amplifiers of the postulated action of the 'will'...'will' modifies the spatio-temporal 'fields of influence' that become effective through this unique detector function of the active cerebral cortex....It will be agreed with Rhine (1948) that, if

the so-called psi capacities (psychokinesis and extrasensory perception) exist, they provide evidence of slight and irregular effects which may be similar to the effects which have here been postulated for brain-mind liaison, where they would occur in highly developed form." (p. 267, 275, 277, 284)

o Thouless and Wiesner (1947): "We wish to suggest...that these [paranormal cognition and psychokinesis] are merely unusual forms of processes which are themselves usual and commonplace, and that in their usual and commonplace form, they are to be found as elements in the normal processes of perception and motor activity....I control the activity of my nervous system (and so indirectly control such activities as the movements of my body and the course of my thinking) by the same means as that by which the successful psychokinetic subject controls the fall of the dice or other object." (p. 195, 197)

o J. B. Rhine (1943): "The mind or subjective self in its domination of the body exercises a causal influence which cannot be otherwise than kinetic. Thus psychokinetic action...is the basis on which every man interprets his routine experience of daily life." (p. 70)

o Hereward Carrington (1909): "Now, if mind exists apart from the brain and merely utilizes it to manifest through, it is acting upon it by a species of telekinesis all the time! Every mental state and change--accompanied, as it doubtless is, by molecular action, chemical changes, etc.--is the result of a telekinetic action! There should be no very great difficulty in imagining consciousness capable of affecting the outside material world, therefore." (p. 295)

o Sydney Alrutz (1909): "What is happening in the brain...when we move an arm by means of an act of will?...Are these entirely electrical and chemical forces?...Might there not be...some form of energy more closely allied to the psychic acts, constituting a sort of bridge or transition between psychic phenomena...and electrical and chemical phenomena? (cited in Carrington, 1921, p. 114-115)

o F. W. H. Myers (1886, 1903): "...perhaps when I attend to a thing, or will a thing, I am directing upon my own nervous system actually that same force which, when I direct it on another man's nervous system, is the 'vital influence' of mesmerists, or the 'telepathic impact'...." (1886, p. 127-128); "...the telekinetic force...is generally...a mere extension to a short distance from the sensitive's organism of a small part of his ordinary muscular power." (1903, vol. 2, p. 208)

o E. W. Cox (1874): "The theory of *Psychic Force* is in itself merely the recognition of the now almost undisputed fact that under certain conditions...a Force operates by which...action at a distance is caused...As the organism is itself moved and directed within its structure by a Force which either is, or is controlled by, the Soul, Spirit, or Mind..., it is an equally reasonable conclusion that the Force which causes the motions beyond the limits of the body is the same force that produces motion within the limits of the body." (p. 101)

Honorton and Tremmel (1979) and Varvoglis and McCarthy (1986) have recently begun to develop potentially useful empirical methods for exploring the volition/PK theory.

Appropriateness

Living target systems possess a number of characteristics that make them

especially susceptible to distant mental influence and hence quite useful as "psi detectors."

Lability. Early empirical PK work (see Rush, 1976), the various quantum mechanical and noise-reorganization models of PK (see Oteri, 1975; Puharich, 1979), Stanford's (1978) conformance behavior model, and my own lability/inertia model (Braud, 1981) all predict greater psi influences upon random or labile systems than upon non-random or inert systems. Since living systems possess a great deal of lability or free variability, they would seem to be excellent candidates for sensitive and effective detectors of distant mental influence. I was delighted to find the following unexpected passage in one of Carrington's (1921) volumes. The passage is from a presentation of Sydney Alrutz to the Sixth Psychological Congress which met in Geneva in August, 1909.

> When we wish to study the electrical charge contained in any body, we obtain exactitude only when we succeed in transferring this charge to another body; we may then study the nature of the charge under varying circumstances, and establish the influence of the two charges upon one another. It is only in this way that experimentation becomes truly fertile. Should we not apply the same laws to the phenomena of the nervous system, and institute a similar mode of experiment for the nervous energies? Under what conditions can we conceive this transference?
>
> The most natural supposition seems to be that it would occur, if at all, in labile organizations; in those subjects which, according to Janet...possess an excessively unstable personality; and whose psychic life is characterized by great suggestibility, by instability, and a certain peculiar mobility. Such individuals are also characterized by the great facility with which the functions vary and react upon one another. Binswanger has said that the nervous system of these

> individuals is characterized by the variability of the dynamic cortical functions; that is to say, by the fact that the nervous segments of their cerebral cortex present a *melange* of greater or lesser irritability. (p. 115)

It was pleasing to find such an early, yet relatively accurate, statement of the lability idea. An important warning should be inserted at this point. The term "lability" is sometimes used in psychology and psychiatry to indicate extreme reactivity or extreme variability of mood or behavior. My own use of "lability" should not imply such an extreme case. I use the term to indicate flexibility, ease of expression, freedom to change, free variability. A system that is excessively active is too "driven" to be modulated in an efficient manner; it is constrained by its own overactivity. Such excessively active systems might be as insusceptible to psi influence as would be excessively sluggish or inert systems.

Perhaps the usage of lability that comes closest to my own is that of I. P. Pavlov, who used the expression in his classification scheme of the "types of nervous systems" of his experimental animals. Pavlov and his co-workers classified their dogs on the basis of three major dimensions: *strength*, *equilibrium*, and *mobility*. "Strength" referred to the "working capacity" of the cerebral cells, their resistance to powerful external disruptors and stress, and their resistance to the development of a kind of brain-protecting "transmarginal inhibition" due to excessive stimulation or excessive environmental demands. "Equilibrium" referred to the balance of excitatory and inhibitory tendencies. "Mobility" or "lability" referred to the ease and speed with which behavior and brain processes could shift from one state to another to keep pace with changing environmental demands. A labile nervous system changed rapidly in response to a stimulus and rapidly returned to its prior state upon the removal of the stimulus. A good synonym for lability might

be "speedy appropriateness" of responding (this synonym was not used by Pavlov).

The various combinations of these three dimensions yielded several "types" of nervous systems, and these types were observed to respond quite differently to environmental stimuli, conditioning demands, pharmacological agents, spontaneous stressors, etc. Although developed initially to help understand the varied reactions of dogs in the experimental study of the physiology of "higher nervous activity," the typology concept was subsequently extended to human behavior and to the area of psychopathology. Relevant information may be found in Pavlov (1927, 1957), Gray (1964), Kaplan (1966), Lynn (1966), and Sargant (1957). The Pavlovian typology issue is an exceedingly complex one, and, perhaps for that reason, it has suffered unfortunate neglect. Many of the Pavlovian concepts have important similarities to the introversion/extraversion and neuroticism constructs of Hans Eysenck (e.g., Eysenck, 1967a, 1967b). Eysenck's personality theory is, in a way, a blending of the typologies of Ivan Pavlov and of Carl Jung. In view of recent parapsychological interest in introversion/extraversion (e.g., Palmer, 1977) and in the Myers-Briggs Type Indicator, which is, of course, based upon Jung's typology (see Berger, Schechter and Honorton, 1986; Honorton, Barker, Varvoglis, Berger and Schecter, 1986; Schmidt and Schlitz, 1988), a careful and systematic exploration of Pavlov's typology in relation to psi influence might prove quite productive.

We have been considering the possible psi-conduciveness of the *physical* lability of target systems. Physical lability is almost inevitably accompanied by *perceived* lability, and this latter factor may have an important *psychological* influence upon an investigation's outcome. In any experiment which provides trial-by-trial feedback to the subject, the subject is necessarily aware of the ongoing changes in the state of the target

system. The knowledge that develops during the course of the experiment that the target system *can* change, and indeed is changing, may increase the subject's belief or confidence that a distant influence upon the target system is indeed possible; these attitudinal shifts may, in turn, affect psi scoring. Even in distant influence experiments in which immediate feedback is not provided, the simple *knowledge* that a changing living system is involved may have psi-favorable psychological effects. It would be possible to disentangle the usually confounded effects of physical lability and perceived or known lability through the use of special experimental designs in which these factors are manipulated independently and blindly; however, such investigations have not yet been carried out.

Living systems as detectors/amplifiers. There is a tendency to think of *detectors* as inanimate, physical devices that respond to the presence of particular materials or energies. However, living organisms themselves can function as exquisitely sensitive detectors of subtle energies and of extraordinarily low concentrations of materials. In biology and in medicine, biological preparations are sometimes used to detect the presence or amount of a substance for which physical detectors have not yet been developed. Such "bioassays" may continue to be used even after the development of appropriate physical detectors. Bioassays have been, and continue to be, useful in the discovery of various hormones, vitamins, and neurotransmitters. Otto Loewi's (1921) use of heart muscle preparations in the detection of "vagus substance" (later identified as acetylcholine) is one of the best known applications of the bioassay. The technique could be extended to yield a "behavioral bioassay" in which observations of changes in the behavior of intact organisms indicate the presence of some agent or energy. Examples of the behavioral bioassay include observations of changes in the aggressive behavior of Siamese fighting fish in the evaluation of tranquilizing drugs (e.g., Walaszek and

Abood, 1956) and observations of changes in web-spinning behaviors in spiders in response to minute quantities of LSD, psilocybin and mescaline (Weckowicz, 1967). There have been claims that behavioral bioassays may be used to detect specific memories; however, those claims remain controversial (Braud, 1970; Braud & Braud, 1972; Smith, 1974; Stewart, 1972: Ungar, Desiderio & Parr, 1972).

This material is offered as background to the conjecture that *the human brain may function as a bioassay for mind, and living systems may function as bioassays for psi*. This conjecture is not essentially different from the proposals of Eccles (1953), Dobbs (1967), and Walker (1975) that the brain may be an especially sensitive detector of small influences due to its vast number of interconnecting neurons, some of the synapses of which may be poised at critical levels of excitability. A slight influence at the synapse of a single "critically poised" neuron could lead to a cascade of subsequent neuronal firings that could in turn lead to gross behavioral, physiological, or subjective reactions. Thus, the system could function not only as a detector, but also as an amplifier of subtle mental influence.

It may be possible to construct complex, interactive inanimate systems whose similarity to the brain might allow them to function as mental influence detectors. As early as 1947, Thouless and Wiesner described the requirements of such a physical system.

> ...the ideal mechanism for studying [psychokinesis] would be one in which very minute forces could start processes in systems of small size, which processes could act as triggers for subsequent processes involving sufficiently large forces to be easily observable. If indeed a physicist could construct for us a mechanism in which there were delicately balanced systems of very small size, which balance could be upset by small forces yet was protected from being upset by small forces accidentally impinging from outside, and if, moreover,

> any change in these small systems could be automatically magnified to a large energy change in some larger system, then we might hope to have the ideal mechanism for the experimental demonstration of psychokinesis. We have not succeeded in devising such a mechanism in our laboratories. (p. 198)

Today, there exist several physical systems that may indeed satisfy the Thouless and Wiesner requirements. One such system consists of computer-based *neural networks* (see Kelly, 1979; Radin, 1988). Other possibilities would include physical systems of the sort being explored in the new discipline of "chaos" theory and which exhibit unusually sensitive dependence upon initial conditions (see Gleick, 1987; Jantsch, 1980).

Multiple psi channels. It is likely that distant mental influence experiments with living target systems will yield better psi results than similar experiments with inanimate targets because of the greater number of "psi channels" available in the former. Living target systems may "cooperate" in bringing about the desired outcome through the aid of their own telepathic or clairvoyant abilities, combined with intentional or unintentional self-regulation. This would seem especially likely when other persons serve as target systems. In a "bio-PK" experiment, for example, in which my aim is to reduce the EDA of Person A during certain periods, I may achieve that goal by means of a direct PK influence upon A's EDA. However, it is also possible that A will "scan" the experimental environment and discern the pattern of activity that I expect of him or her. Person A could become aware of that pattern through telepathic access to my influence attempt or through clairvoyant access to a physical record of the influence/non-influence schedule. Person A could then produce the desired EDA patterns in herself or himself through autonomic self-regulation. Of course, both PK and telepathy/clairvoyance may be occurring at once, or the two forms of psi may alternate

throughout the trials of an experiment. For one of these "channels," the locus of the psi is the influencer; for the other channel, the psi locus is the ostensible "target person."

We are planning a blood pressure bio-PK study that may cast light on this issue of the true psi locus in such experiments. We plan to assess subjects' abilities to self-regulate blood pressure in an initial screening phase of the study. In the next phase, all of the screened subjects will serve as target persons in bio-PK sessions in which an influencer will attempt to influence their blood pressures. We are quite interested in learning whether and how the self-regulation and hetero-regulation scores of these two phases are correlated. If successful bio-PK is due primarily to receptive psi plus self-regulation, one would expect that the most successful sessions would involve subjects who are very good at self-regulation; a strong positive correlation between the Phase 1 and Phase 2 scores would be consistent with this hypothesis. On the other hand, if no correlation or a strong negative correlation between Phase 1 and Phase 2 scores obtains, such an outcome would be more difficult to explain on the basis of this hypothesis. A strong negative correlation or no correlation would be of greater interest than a strong positive correlation, since the latter could also be interpreted as merely an indication that the blood pressure activity of certain subjects is more labile and *generally* influenceable than that of other subjects. It is recognized that no experimental outcome will point conclusively to one or the other of these two interpretations of "true psi locus," and my suspicion is that successful bio-PK experiments include elements of both processes, and that the real locus of the effect is in neither the influencer nor the subject, exclusively, but in an interactive field in which both participate.

Another approach to the self-regulation issue would involve experiments with response levels that vary in the ease with which they can be self-

regulated. Motor activities and breathing are relatively easy to consciously self-regulate, while certain autonomically mediated functions (such as foot temperature or blood pressure) are more difficult to voluntarily control. Would bio-PK studies involving the former be more successful than those involving the latter? Again, outcomes will not be conclusive because of the problem of possible skeletal or cognitive "artifacts" (see Katkin & Murray, 1968), but would be of interest nonetheless.

A third approach to this issue would involve varying the phylogenetic or ontogenetic status of the target organism, or testing organisms under conditions that would be expected to influence self-regulation ability. What would be the outcomes of bio-PK experiments in which one attempts the distant mental influence of skeletal responses in: (a) infants who have not yet manifested a great deal of motoric self-control, or (b) persons in REM sleep in which most motoric activity is inhibited, or (c) organisms that are only distantly related to human beings?

We have been assuming that in distant influence experiments, there are indeed changes in the activities of the living target systems that are produced "causally" or "psychokinetically" by the influencer and that would not occur otherwise. In situations in which the *a priori* probability of a particular target reactions is quite low or in cases in which the reactions is relatively complex, this seems to be a quite reasonable assumption. However, in *statistical* experiments in which the target activity has a relatively high probability of occurring naturally, there arise the additional possibility that the influencer *psychically perceives* the present or future activities of the system and schedules his or her "influence attempts so that they happen to coincide with the system's activities, thus producing an illusion of a causal effect. The precognizing of "favorable" segments of ongoing random events was suggested many years ago by W. E. Cox (Cox, personal communications; Hansen, 1987) as a

possible alternative explanation of most radioactivity-based REG "PK" effects. This interpretation has recently been revived, with the new name "intuitive data sorting" or "intuitive data selection" (see Weiner & Nelson, 1987, pp. 136-144).

It certainly is possible that IDS may play some reole in some distant mental influence experiments; however, the extent of such influences remains to be determined. Two recent explicit tests of the IDS hypothesis in our own laboratory (Braud & Schlitz, 1987; Braud, 1988) did not yield results consistent with the IDS explanation.

Levels of influence. Another advantage of living target systems in distant mental influence research is that such systems possess multiple "levels" of activity which may be targeted for possible influence. The relative susceptibility of those levels could then be compared. For example, experiments could be designed in which one attempts distance mental influence of the thoughts, images, feelings, behavior, gross physiological activity, molecular physiological activity, biochemical activity, or immunological activity of another person. Would influence attempts be equally successful at those various levels of response? One could even attempt to exert a distant mental influence upon the *psychic* activity of another person.

Experiments could be designed to study the degree of co-variation or dissociation among various levels. What happens at Level X when distant mental influence is directed toward Level Y? Are the outcomes symmetrical or asymmetrical? What happens at Level Y when attempts are made to influence Level X?

Other influences upon the target. Living target systems permit the study of several nonpsi factors that might influence the psi susceptibility of the system. I was tempted to say that living systems are susceptible to more

influences than are inanimate systems, but this is not necessarily true (see below). It would be more accurate to say that living and nonliving systems are susceptible to *different* nonpsi influences. It would be possible to study the influence of a certain nonpsi factor upon both influencer and target system. Would the factor have the same influence in these two cases? According to certain models of psi functioning (e.g., my lability/inertia model [Braud, 1981]; Roll's "systems theoretical" model [Roll, 1985]), certain variables (e.g., level of arousal, degree of cognitive constraint, etc.) are expected to have opposite effects upon different psi processes or upon systems with different roles in psi interactions. Living target system research can provide a testing ground for some of these ideas.

DISADVANTAGES

The use of living systems in distant mental influence research is not without its disadvantages.

Logistical Difficulties

Experiments with living target systems may be more complicated than inanimate target system experiments in that the target systems themselves require additional scheduling and maintenance. In planning an REG-PK session, one has only to schedule an influencer. In a bio-PK session involving a human target person, one has to schedule two people, and if one of these persons fails to appear at the laboratory, the session must be cancelled or postponed. If the experiment involves animals, plants, or cellular systems, one must have additional facilities for their housing, maintenance, and preparation. The experimenter also will have to become familiar with the living system and learn its requirements, sensitivities, habits, preferences, etc. All of this makes life more complicated, but also more interesting, for the experimentalist. And what does one do with one's experimental organisms when the experiments have been completed? The most ideal and most humane

solution is to borrow one's target creatures from Nature for a while, then return them unharmed when the study has been completed.

Manipulation of Life Forms

One must deal with the ethical issue of whether it is proper to influence the actions of other people or of other life forms. We have worked with over four hundred people in our various bio-PK studies, and less than a half-dozen of these expressed any concern about the possibility of influencing or being influenced by another person. If other persons serve as target systems, there would seem to be no ethical problems as long as (a) subjects give informed consent, (b) the planned influences are not deleterious to the target person, and (c) there is proper debriefing in which the likelihood and extent of distant influence are placed in a proper context for the subjects. Some formal or informal screening might be useful in order to eliminate subjects who might deal with the issue of distant influence in an imbalanced manner. As in any other experiment, clinical interaction, or everyday life situation, problems may be avoided if one uses good judgment and common sense. In our own work, we have dealt with possible ethical issues by choosing target reactions that are generally beneficial to our subjects. In the use of animals or plants in distant influence experiments, one could choose target reactions or activities which are not harmful to those organisms. In healing analog studies, participants are sometimes asked to destroy "harmful" organisms such as bacteria or cancer cells. The same arguments and considerations used by those who use pharmacological or other treatments to destroy these organisms in other, usually medical, contexts would be relevant here. Cost/benefit analyses, "greater good" judgments, and personal attitudes will govern final decisions.

Those who are troubled by the "manipulative" aspects of distant mental influence studies might consider whether a psychic "command" to make a

particular movement really differs from a similar "command" of an agent to a subject to *think about* a particular target in a card guessing, Ganzfeld, or remote viewing experiment. The major difference seems to lie in which influence might be considered to have a stronger possible impact upon the external, physical world. To assert that the psychic production of a muscle twitch is more powerful or more coersive or manipulative than is the production of a "mere" mental image is to ascribe a greater reality status to the former than to the latter. This is certainly questionable. Images are no less real than are muscular movements and may have even more profound environmental and social consequences under certain conditions.

Psi-Missing in Healing Studies

It is my impression that psi-missing occurs less frequently in living target studies than in inanimate target studies. Still, psi-missing has been reported in healing analog studies (e.g., Grad, 1967; Wells & Klein, 1972). This possibility should be kept in mind by anyone considering practical applications of distant mental influence; the procedure could backfire. This possibility is not really surprising, since any treatment (e.g., drugs) can have reversed or "paradoxical" effects under certain conditions, and no treatment is entirely without possible negative side effects. It would seem especially important to explore the conditions which tend to produce psi-missing in living target influence experiments so that those conditions could be avoided in practical application attempts.

Experimental Control

It might seem that controlling extraneous variables would be more difficult for living than for inanimate target systems and more difficult for complex organisms than for primitive ones. This is not necessarily true. The extraneous variables are simply different in these cases and not necessarily more or less numerous. One has but to read Hubbard, Bentley,

Pasturel and Isaacs' (1987) account of the development of their monitoring, isolation, and artifact detection systems for piezoelectric strain gauge PK targets to realize how difficult controlling extraneous variables can be in the case of inanimate target systems. In the case of living systems, "higher" organisms can filter or screen themselves or compensate for environmental variables which would exert strong influences upon more "primitive" organisms. For example, a subtle temperature change could have a marked influence upon in vitro cellular preparations, while even large temperature fluctuations might go completely unnoticed by human laboratory participants. What is a signal at one level of biological development becomes noise at another level, and adaptive pressures have produced and perfected quite efficient noise-cancelling mechanisms.

Statistical Issues

Possible statistical problems unique to living target distant influence research have been discussed by Solfvin (1984) and by Rush (1986). An issue that has not received adequate treatment is the possible *lack of independence* of repeated measurements of the activity of a biological target organism. In electrodermal bio-PK experiments, for example, external conditions or endogenous rhythms could result in relatively long "bursts" of nonindependent activity or inactivity. If successive "samples" of this activity are treated as independent when they are in fact positively correlated over time, statistical tests (such as t tests) that assume independent units would be artificially inflated. We have dealt with this possibility in our EDA bio-PK experiments by not treating the many trials of our sessions as units for statistical analysis, but, rather, have collapsed all of the trial activities into a single score for the subject; i.e., the entire session becomes either a hit or a miss (depending upon whether there was more or less overall activity, respectively, in the prescribed direction in the influence trials, compared

with the noninfluence, control trials). This amounts to a "majority vote" procedure which eliminates possible statistical dependency problems but is extremely wasteful of data. Alternative solutions would be: (a) to attempt to determine empirically the nature of the correlation among the data points and include the value of such a correlation as a correction in computing t scores, or (b) to attempt to show that successive target activity measures are in fact independent. If the data can be reduced to binary form, a number of statistical tests for intertrial independence or randomness are available (e.g., Davis & Akers, 1974; Dudewicz & Ralley, 1981). For analog data, correlations of activity with trial number (Utts, personal communication, 1988) or the use of autocorrelation techniques (see Braud, 1988) would be helpful.

Trial dependence is problematical in situations in which the very same target organism participates in all trials of an extended measurement block--e.g., placing a laboratory rat in a test apparatus for 15 minutes and measuring its activity 10 times (i.e., for 10 "trials") during that long period. The problem can be reduced or obviated by using different organisms or different biological samples for the different trials. This is analogous to making activity measurements in 10 different laboratory rats placed sequentially in the measuring apparatus throughout a 15-minute period, all rats being selected or sampled from a common group colony cage. One would still have to be careful to eliminate external or internal factors that could bias subsets of organisms or trials in different directions for experimental and control treatments, respectively.

Resistance

Researchers who explore the distant mental influence of living systems will encounter *resistance* in all of its manifestations. The living target system itself, at a *physiological* level, may resist a distant mental influence, especially if that influence opposes a strong hemeostatic tendency.

It would seem that psi influence attempts would be most successful if they were directed in a manner that would assist the organism's return to a balanced condition. Assisting homeostasis should not be confused with the statistical artifact of regression to the mean, about which Child (1977, 1978) has warned us, and against which experimental precautions should be taken.

Of equal interest are the various forms of *psychological* resistance that may be encountered in the subjects and experimenters of distance influence experiments, as well as in the reactions of one's colleagues and critics. Success at distant mental influence may trigger conscious or unconscious thoughts or feelings about the possible abuse of such "powers" which in turn may activate certain psychological mechanisms of defense against the resultant threatening impulses or fears. These issues have been discussed by Eisenbud (1963, 1972, 1977, 1983), Tart (1984), Braude (1986), Inglis (1981), and Braud (1984). Fears of the possibility of "evil" mental influence may indeed be responsible for the dearth of studies of distant mental influence of human subjects, even in the context of healing or healing analog investigations. It has also struck me as curious that the most explicit treatments of the possibility of harmful psi influences in everyday life, i.e., the theories of the Greek psychical researcher Angelos Tanagras (1949, 1967), have been almost totally ignored by parapsychologists.[7]

The issue of psychological resistance is a complicated one and one for which there would seem to be no easy solution. One method of countering defenses would be the provision of a nonthreatening context for one's distant influence experiments, such as healing or another positive application (see Braud, 1984; Benor, 1985). Another method of dealing with defenses would be to attempt to assess the presence and degree of these defenses in various subjects and experimenters (through use of a specially constructed version of the "Defense Mechanism Test," for example) and to study the manner in which

this assessed factor interacts with psi performance or ways in which such defenses might be reduced.

A CONVERGING STRATEGIES APPROACH

In a classic 1968 *Psychological Review* paper, Stoyva and Kamiya proposed a "converging operations" approach to the study of consciousness and illustrated that strategy in the contexts of the experimental study of dreaming and the waking mental activity associated with EEG alpha control. The strategy utilizes the convergence of different types of indicators (i.e., psychophysiological, behavioral, and verbal) in the definition of a hypothetical construct such as a particular state of consciousness. Recently, Rex Stanford has been using a similar approach in his studies of the psi-conduciveness of Ganzfeld stimulation (e.g., Stanford, Kass, & Cutler, 1988). I would like to suggest a multi-component strategy in which converging operations of three kinds may be used in elucidating the problems of "consciousness" and "life." The strategy may be illustrated in the context of psychokinesis. Research would be conducted in three areas in order to determine: (a) whether animate and inanimate systems differ in their *susceptibility* to a PK influence, (b) whether animate and inanimate systems differ in their ability to *produce* psychokinetic effects in other systems (or, better, to produce "conformance behavior" in other systems; see Stanford, 1977, 1978; Edge, 1978; Braud, 1980; Varvoglis, 1986), and (c) whether "pre-observations" of random events by animate versus inanimate systems differentially influence the susceptibility of such events to later psychokinetic influence (see Schmidt, 1984, 1985, 1986, 1987). Ideally, many studies would be carried out in parallel in these three different areas by many different investigators (preferably by investigators with different belief systems regarding the studied phenomena). The studies could be done using a variety of life forms (of different phyletic and ontogenetic status)

and a variety of inanimate systems (differing, perhaps, in their degree of complexity and the degree of interconnectedness of their component elements). Similar parallel experiments could be conducted with human influencers, influencees, and pre-observers who are in various states of consciousness during their experimental sessions. Outcomes of these studies that would be of great interest and theoretical importance would be: (a) the discovery of specific graded or discontinuous curves relating outcome likelihood to the life- or consciousness-status of the experimental participants in each of the three research areas, and (b) a *similarity* of the three obtained functions. Throughout this endeavor, great care would have to be exercised to assure that comparison tests were carried out under identical psychological conditions, using the proper multiple blinds and design considerations. While findings in any one area would be far from definitive, the *convergence* upon the same conclusion of evidence from three different research domains would be more compelling and could lead ultimately to a true comparative psychology of consciousness or mind.

Let me illustrate the use of this strategy more concretely. Let us suppose that we carry out REG-PK experiments with alert humans, drowsy humans, dolphins, chickens, earthworms, protozoa, plants, complex machines, and simple machines as the ostensible subjects or influencers. In some cases, the REG "hit" feedback would have to be transformed into environmental events that satisfy the organisms' needs or allow the execution of some strong predisposition. It is also important that the various experiments be given sufficiently fair tests; i.e., experiments should not be tried only once or a few times and abandoned prematurely because they "didn't work." Next, we conduct distant influence experiments in which these same respective organisms and devices serve as targets. Finally, we have the respective organisms or devices "pre-observe" REG events before the latter are subsequently displayed

as PK targets for a human influencer. Let us suppose that the strength of the PK effect (as assessed by some appropriate standardized measure such as effect size) differs for alert versus drowsy human influencers, and that a similar functional relationship is found in the case of alert versus drowsy human pre-observers. Or, suppose all three effects tend to occur for dolphins, humans, and chickens, but not for earthworms, protozoa, plants, or machines. Such convergent outcomes might point to interesting gradients or discontinuities among the systems which then could be explored more incisively.

OTHER CONTEXTS

We have been considering distant mental influence as it occurs in the context of quasi-experimental or experimental psi studies. In these studies, attempts are made to study the process *in isolation*, without the possibility of conventional sensory or motor accompaniments. A sufficient number of such experiments have been successful, and have yielded sufficiently impressive results, to lead us to conclude that direct distant mental influences upon living systems are possible. There is, therefore, an even greater likelihood that direct distant mental influences upon living systems may occur frequently and strongly in everyday life situations and may be intertwined with more "conventional" control modalities. We influence others by means of our words, expressions, and actions. We influence our own bodies through various neural and hormonal processes. It is not unreasonable to assume that we also influence other persons or our own physiological functioning through direct psychic means, acting in parallel with more conventional means. Perhaps psychic influences modulate or orchestrate the more familiar physical and chemical processes that support and govern our everyday actions. [K. Ramakrishna Rao explores this very idea in another paper of this volume.]

When we succeed in influencing ("self-regulating") our somatic functioning in contexts of auto-hypnosis, autogenic training, biofeedback,

visualization effects, or rehabilitation training to recover or compensate for lost muscular functioning, perhaps we are exerting direct mental ("psycho-kinetic") influences upon our somatic systems. When we attempt to help restore the mental and physical health and well-being of other persons in contexts of medical treatment, nursing care, therapy, counseling, and teaching, perhaps we are exerting direct mental influence upon our patients, clients, and students. Similar suggestions may be found in a previous paper of mine (Braud, 1986) and in the writings of R. A. McConnell (see McConnell, 1983, 1987). Tanagras (1949, 1967) discusses the possibility of direct psychic influences in mundane contexts, as well as in more exotic contexts involving "the evil eye" and the possible effects upon others of negative thoughts and feelings. A more contemporary treatment of possible interactions of sorcery, psi phenomena, and stress among certain Amerindian groups may be found in Lake (1987). On the more positive side, direct mental influence may be implicated in extraordinary athletic or martial arts accomplishments, such as those described by Murphy and White (1978).

HARMFUL OR UNWANTED INFLUENCES

Is it possible to prevent harmful or unwanted distant mental influences, and if so, how can this be done? This is an important issue, and one that is difficult to address adequately because of the absence of necessary research findings. In the various experiments on the distant mental influences of human subjects, which have been discussed in this paper, it might be argued that influence is possible provided the subjects give explicit or tacit consent to be influenced. In the various "bio-PK" experiments on physiological influence that we have conducted in our laboratory, the subjects knew the nature of the influences which were to be attempted and agreed to let such influences occur. The experiments could be viewed as social agreements or "contracts" in which the experimenter, the influencer, and the subject all agree to play certain roles having psychic components; each participant plays

his or her proper role in order for the experiment to succeed. Allowing one's body to be influenced is part of the task demand with which the subject willingly complies. It is in everyone's best interest for the experiment to succeed. It could be argued that even in experiments in which the subject is conventionally "unaware" that influence attempts will be made, the subject may be *psychically* aware of the possibility, and that there are tacit understandings of appropriate roles and useful outcomes. Perhaps such tacit consent to be influenced and resultant compliance would not occur in situations in which the attempted influence is a deleterious one.

There is actually no compelling evidence that bears directly on the issue of whether external psi influences can produce undesirable effects in a person. If the influences under consideration are direct, causal, "psychokinetic" ones, unwanted influence may have a greater likelihood than if the influences are really unconsciously self-produced and merely aided or triggered by telepathic or clairvoyant knowledge of what actions are expected. To the extent that psi manifestations in a "target person" make use of the images, thoughts, and feelings of that person as "vehicles" for their expression, psi influences could be allowed or prevented through the use of the same self-control techniques by which the target person customarily modulates his or her own thoughts, images, feelings, and behaviors in more conventional contexts. Processes of intention and acts of will should be just as effective in the psi realm as they are in more ordinary domains.

Psychological and, possibly, psychic techniques could be used to prevent unwanted influences. These techniques involve reminders of self-control, self-responsibility, internal locus of control, and ultimate "veto power" over what one does upon the suggestion of others. Confidence enhancing images of barriers, screens, shields, or other symbols of protection might be used to effectively block unwanted psi influences. We have used such techniques, with

initial indications of success, in some of our EDA bio-PK experiments. More extensive studies of "psi blocking" techniques in other contexts are still in progress, and we hope to report their results soon.

The demand characteristics of laboratory experiments make difficult or impossible any final resolution of the issue of whether unwanted or harmful psi influences can ever really occur. The situation is similar to the one that obtains in hypnosis or compliance research: Subjects may, at some level, recognize that experimenters would not allow anything that is truly harmful to occur; i.e., subjects may discern that some experiments may be dramatic instances of play-acting designed to prove a particular point of view of the investigators. Ethical constraints would not allow more realistic experiments or tests in everyday life that are not "play-acting."

Perhaps the most valid evidence bearing on this issue will come from careful anthropological observations in natural settings. Even here, however, certain complexities and alternative interpretations will remain. For example, consider a well-authenticated case in which Person X becomes seriously ill or even dies shortly after being "hexed" or "cursed", *without his or her knowledge*, by Person Y. How could we exclude the possibilities that (a) Person Y precognized Person X's illness or death and then engineered the ostensible "magical" influence in order to convince others of unusual causal powers that Person Y really does not possess, or (b) that Person X actually injured himself or herself as self-punishment for some real or imagined crime, sin, or taboo-violation--i.e., that Person X committed a sort of socially approved suicide, using psi-provided knowledge of an actually ineffective "curse" as an opportunity for this action? Are these reasonable alternative explanations, or are they continuing manifestations of psychological defense against the possibility of truly causal external psi influences of a harmful nature? Could our hope to assign a definite form and definite locus to these effects be a misguided one? Perhaps the most

satisfactory interpretation will be one in which psi influence effects are understood as field-like effects contributed by *all* participants and involving several "forms" of psi.

The complexity of designing research or of interpreting findings relevant to this issue soon becomes apparent. It become more understandable why so few researchers have grappled with the issue of possible harmful or unwanted psi influence effects.

Findings

I have presented various considerations which favor the use of living target systems in distant mental influence research. I will conclude with a brief summary of some of the findings and conclusions that are emerging from our work with living target systems in our Mind Science Foundation laboratories.

1. Based upon overall statistical results, the distant mental influence effects are relatively reliable and robust.

2. The magnitudes of the effects are not trivial and, under certain conditions, may compare favorably with the magnitudes of self-regulation effects.

3. The ability to manifest the effect is apparently widely distributed in the population. Sensitivity to the effect appears to be normally distributed in the volunteer subjects who have participated in our various experiments. Many persons are able to produce the effect, with varying degrees of success, including unselected volunteers attempting it for the first time. More practiced individuals seen able to produce the effect more consistently. There are indications of improvement with practice in some influencers.

4. The effect 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 and visualization of the desired outcome is effective.

7. The effect 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.

9. Generally, our volunteer participants have not evidenced concern over the idea of influencing or being influenced by another person.

10. The effect can be intentionally focused or restricted to one of a number of physiological measures; it may also take the form of a generalized influence of several measures, if that is the intent of the influencer.

11. A number of target systems have been found to be susceptible to the effect, including the spatial orientation of fish, the locomotor activity of small mammals, the autonomic nervous system activity of another person, the muscular tremor and ideomotor reactions of another person, the mental imagery of another person, and the rate of hemolysis of human red blood cells *in vitro*.

12. Thelivingtargetsystemscanbeinfluencedbi-directionally;i.e., their activity levels can be either increased or decreased.

13. The activity levels of at least some of the target systems (i.e., electrodermal activity, rate of hemolysis) and their susceptibility to distant mental influence appear to be influenced by geomagnetic field (GMF) activity; i.e., the systems are more active and more susceptible

to influence when the earth's geomagnetic field activity 'is more "stormy" than during more "quiet" GMF periods.

14. Distant mental influence, in the expected direction, seems more successful when the intentions and images of the influencer are focused *specifically on the desired target activity*, rather than directed toward the target in a more general or global manner.

15. The effect 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 distant mental influence effect 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, of course, is needed to determine the validity of these conclusions and to explore more thoroughly the various physiological and psychological factors that are favorable or antagonistic to the occurrence of the effect.

We are continuing our laboratory studies of distant mental influence of living systems, being especially interested in exploring the possible limits of such effects and whether the effects can be *strong* and *consistent*

enough to yield possible practical applications (e.g., in the area of healing). We hope that this presentation will encourage others to carry out similar investigations.

ENDNOTES

1. Julian Isaacs (1983) has argued that physical systems with very low spontaneous activity levels would be ideally suited to the direct detection of subtle PK effects.

2. It was Elliotson who introduced the stethoscope into hospital practice.

3. Inspired by these sorts of reports (especially those of Townshend), Edgar Allan Poe featured distant mesmeric influences in two of his short stories, "A Tale of the Ragged Mountains" (1844) and "The Facts in the Case of M. Valdemar" (1845). Distant mesmeric influence also was featured in Robert Browning's poem, "Mesmerism," written during this same time period (see Schneck, 1956).

4. It is not generally known that, in 1889, Charles Richet published a sensational novel, *Sister Marthe*, which featured hypnosis and dual personality; he published the novel under the pseudonym, Charles Epheyre.

5. It was Bechterev, of course, who pioneered the learning paradigm which later came to be known as "instrumental" or "operant" conditioning, and which was later so well explored and exploited by B. F. Skinner and his co-workers; Ivanov-Smolensky specialized in "semantic" conditioning and his investigations are important in the understanding of the Pavlovian "second signalling system" (i.e., the experimental study of language and thinking).

6. Loewi's findings were not immediately accepted because of the difficulties encountered by other investigators in replicating his work. The vagus nerve of the frog also contains a sympathetic accelerating component. The nerve's action is therefore mixed, sometimes accelerating the heart and sometimes decelerating it. Which particular action predominates depends upon

the frog and varies with the season of the year. Opposite seasonal variations occur in the toad. Eventually, when these initially occult interactions were realized, Loewi's discoveries were confirmed and are now universally accepted (see Goodman and Gilman, 1956). Perhaps these events will provide encouragement to psi researchers who continue to experience difficulties in their replication attempts.

7. I have been able to find reference to Tanagras' work in the writings of only one psychical researcher, Jule Eisenbud. Tanagras' name does not appear in the indices of the major parapsychological reference works. The one exception is Wolman's (1977) *Handbook*, which gives a single page reference to Tanagras and this is merely to the definition of his term "psychoboly" in the glossary at the end of the volume; interestingly, the page reference is incorrect and Tanagras is not to be found even on the single page for which he is referenced. Could this be still another indication of psychological resistance to the possibility of powerful negative psi influences? locus to these effects be a misguided one? Perhaps the most satisfactory interpretation will be one in which psi influence effects are understood as field-like effects contributed by *all* participants and involving several "forms" of psi.

The complexity of designing research or of interpreting findings relevant to this issue soon becomes apparent. It becomes more understandable why so few researchers have grappled with the issue of possible harmful or unwanted psi influence effects.

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