PSI CONDUCIVE CONDITIONS: EXPLORATIONS AND INTERPRETATIONS

WILLIAM G. BRAUD

> Try to be mindful and let things take their natural course. Then your mind will become quieter and quieter in any surroundings. It will become still like a clear forest pool. Then all kinds of wonderful and rare animals will come to drink at the pool. You will see clearly the nature of all things in the world.
>
> —Achaan Chaa

> Delight is the secret. And the secret is this: to grow quiet and listen; to stop thinking, stop moving, almost to stop breathing; to create an inner stillness in which, like mice in a deserted house, capacities and awarenesses too wayward and too fugitive for everyday use may delicately emerge.
>
> —Alan McGlashan

A Prefatory Consideration

It has been remarked (by some sage whose name escapes my memory) that all philosophical systems are merely carefully wrought analogies. This paper describes an analogy: the analogy between psi and sensory processing. It even contains a "sub-analogy" between psi functioning and information processing and signal detection theory. The analogy is useful to the extent that it summarizes and systematizes our findings, allows us to link our concepts (in an "explanatory" manner) with those of other disciplines, and generates new research strategies. However, I must caution the reader that the system elaborated in this paper remains analogical. It forces psi into a sensory mold. It treats psi as essentially an information processing system. It assumes "sources" and "signals" and "noise." But these are all analogies, forced upon us by the "spectacles" through which

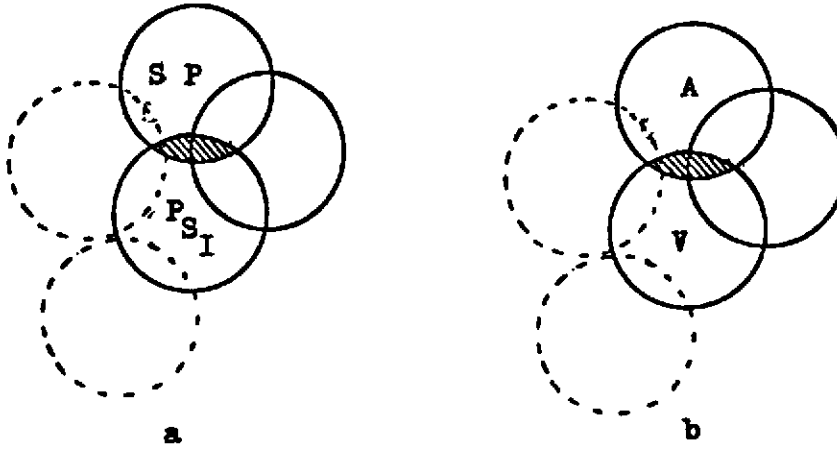

Figure 1. Venn diagrams indicating (a) the overlap between psi and sensory processing, and (b) the overlap between visual processing and auditory processing.

we choose to view psi. In this view, psi exists only to the extent to which its functioning can be sensorily verified (indeed, according to the current scientific paradigm, this is all that can be known). So we study the overlap between psi and sensory processing.[1] Since vision is our dominant sense, we study psi functioning to the degree that it is redundant with visual sensory processing. (This is "seen" most clearly in our choice of target material.) But how much redundancy is there between psi and sensory perception? Of course there is some overlap (Figure 1a); otherwise we could not have learned ("scientifically") what we know about psi. But what about the *non*overlap? What's going on elsewhere in the "psi circle"? And how can we know?[2] We seem to be in much the same position as one who is attempting to learn about vision by studying only the sense of hearing (or by studying persons with very poor vision, or studying blind persons). Of course, there is some overlap, some commonality, among the sensory processing mechanisms for the various modalities (Figure 1b). And, fortunately, we *can* learn a bit about vision by studying only hearing. But to know vision completely, at some point we are going to have to *see*.

Let me belabor this point with an illustration. Suppose a parapsychologist has an out-of-the-body experience. During this experience, he finds himself in a room bathed in moonlight. He "sees" various familiar and unfamiliar objects in the room and recognizes the latter as his living room. Being "scientifically" and "verification"

minded, he notes carefully the positions of various objects and even measures the lengths and angles of their moon-shadows using his (out-of-the-hands) "hands" as measuring devices. Pleased with his accomplishment, he "returns" to his body. Now, he rushes into his living room, yardstick and protractor in hand, to "verify" his experience. Many of the objects are located exactly as he experiences them while "out of the body," including some surprising objects which had been placed in the room after he had last seen it sensorily, unknown to him, by some other member of the household. But alas! To his dismay, he finds that the lengths and angles of the shadows are not as he previously experienced them; the windows are now found to be shuttered and the moon isn't even out![3] What are we to make of these "interesting misses"? Are these merely distortions, illusions? Or have we caught a glimpse of another part of the "psi circle"?

The crosshatched portion of the "psi circle" is bright, familiar, and comfortable; the noncrosshatched area is problematical, dark, unfamiliar. It's no wonder that we've chosen the strategy that we have as "scientific parapsychologists." But are we not behaving like the boy who is searching for a lost object under the bright streetlamp, rather than in the dark alley where he, in fact, lost the object? Streetlamps are comforting and convenient. Dark alleys are frightening: who knows what one might encounter there!

The model elaborated in the rest of this paper is a streetlamp. It might be justified by the hope that if we search long enough and carefully enough, we might find sufficient parts with which to construct a primitive flashlight. Then, aided by the flashlight, we might begin to explore the dark alley in which psi lies waiting. The danger in this approach is that we might become quite comfortable under the streetlamp and become so involved in constructing flashlights and so fascinated by their intricacies that we forget why we originally sought to construct them. We might even forget the alley entirely. Have we lost something?

All of us are familiar with the foregoing comments; but sometimes we forget.

Increasing Awareness of Psi: A Noise Reduction Model of Psi-Optimization

If psi functions, in part, as an adaptively significant information channel, it is reasonable to assume that it is "active" fairly continuously. However, we are not always consciously aware of its activity. It appears to be the case that we become conscious of psi only rarely and only if certain special conditions are present (Broad, 1953). Some of these conditions have been identified by Honorton (1977) as follows:

1. The receiver influence must be detected. With human receivers this means that the influence must take the form of a conscious experience which the receiver can and does attend to.
2. The experience must be sufficiently prominent, or carry sufficient impact to allow the receiver to distinguish it from among the many other (nonpsi) inputs which are concurrently influencing him. In this context, normal perceptual, somatic, and cognitive influences on the receiver constitute sources of noise.
3. The experience must be retained and reported prior to receiver-source contact through normal channels, otherwise it is not evidential of psi interaction.
4. There must be subsequent confirmation of a meaningful correspondence between the source output and the receiver output. Such correspondence need not be literal or exact—there may be information loss—but it must be sufficiently accurate and consistent over repeated transmissions to eliminate chance coincidence as a reasonable explanation.

It is likely that many "consciously registered" psi experiences are not recognized as such because the last three conditions mentioned above are not satisfied. Additionally, psi information may be detected by the organism, but not consciously. The information may be registered only autonomically (e.g., Dean, 1962) or electroencephalographically (e.g., Tart, 1963), but without awareness of the registration. Psi may operate by influencing instrumental behaviors—unconsciously and in the service of needs, as in Stanford's "PMIR" model (1974). It may also be the case that an individual may be only vaguely or partially aware of psi communications which take the form of "impressions," "intuitions," or "feelings," rather than specific imagery (Stevenson, 1970).

It might be possible to increase awareness of psi by reducing certain influences which ordinarily divert attention away from it. This possibility has been suggested by Honorton (1977) and has been developed by him, using the constructs of information processing and signal detection theory. Honorton argues that conditions associated with the withdrawal of attention from external sensory and somatic stimuli and a concomitant shift toward internal processes such as thoughts and images may facilitate psi awareness by attenuating the psi-irrelevant sensory, perceptual, and somatic "noise" which may ordinarily interfere with or mask weak psi "signals."

If such noise could be reduced, attention might be withdrawn from psi-irrelevant foci and redirected to focus on psi-mediating vehicles—images, thoughts, feelings. The psi information contained

in these vehicles might then reach awareness and be reported as psychic perceptions or cognitions. The degree of noise-reduction might determine the degree to which an individual responds to (becomes aware of) psi information. Drastically reduced noise may be associated with a vivid and complete perception or cognition and a very accurate verbal report. Moderately reduced noise may be associated with less complete or more fragmented impressions. Slight noise reduction might be associated with vague impressions, "intuitions," or "feelings," rather than specific knowledge (Stevenson, 1970); it might also be associated with appropriate but unconscious physiological or behavioral reactions of the types studied by Dean (1962), Targ and Puthoff (1974), and Stanford (1974).

This paper is an elaboration and extension of Honorton's "noise reduction" model. It includes suggestions for specifying, measuring, and reducing various "noise" sources, as well as results of experiments which have been conducted in our laboratories to test the usefulness of the model. At the conclusion of the paper, a number of alternative interpretations of these findings are presented.

Noise Sources

In Table 1, the various sources of noise which may mask weak psi signals are listed, along with the methods of measuring their strengths, appropriate noise reducing, psi-optimizing techniques, and references of relevant studies conducted in our laboratories.

Psi-interfering noise may arise from a number of different sources: (a) exteroceptive stimulation (sensory, perceptual noise), (b) somatic, muscular activity (bodily noise), (c) excessive autonomic activity (emotional noise, excess arousal), (d) excessive mental activity, especially (e) analytical, linear, logical, more "left hemispheric" activity (cognitive noise), (f) noise produced by excessive striving to retrieve psi information, and (g) interference from other, target-irrelevant, psi "signals." Any of these noise sources may direct attention toward themselves and away from weaker psi "inputs."

Control of Exteroceptive Stimulation

If psi impressions are mediated into consciousness by internally generated imagery (Tyrrell, 1946; Honorton, Tierney and Torres, 1974), it follows that strong exteroceptive sensory inputs may disrupt such imagery and suppress psi performance. The assumption here is that patterned sensory stimulation is usually biologically salient or strong and may mask the relatively weaker psi-mediating imagery.

TABLE 1

Psi-Interfering Noise Sources, Measurement Techniques, Noise-Reducing Techniques, and Relevant Studies

SOURCES OF NOISE WHICH MAY MASK WEAK PSI SIGNALS	NOISE MEASURE	NOISE-REDUCING PSI-OPTIMIZING TECHNIQUE	STUDIES
EXTEROCEPTIVE STIMULATION	EEG alpha blocking EMG activity self-reports	GANZFELD TECHNIQUE	Braud, Wood, and Braud (1975)
SOMATIC, MUSCULAR ACTIVITY	EMG activity self-reports	PROGRESSIVE RELAXATION	Braud and Braud (1973, 1974) Braud and Altom (1976)
EXCESSIVE AUTONOMIC ACTIVITY	skin temperature BSR/GSR heart rate breathing rate self-reports	AUTOGENIC EXERCISES	Braud and Thorsrud (1976) Braud and Braud (1977)
MODE 2 ("LEFT HEMISPHERIC," ACTION MODE) ACTIVITY	EEG alpha and theta activity in right and left hemispheres self-reports	MODE 1 ("RIGHT HEMISPHERIC," RECEPTIVE MODE) ACTIVITY	Braud and Braud (1975) Braud, Smith, Andrew and Willis (1976)
EXCESSIVE MENTAL ACTIVITY	EEG alpha blocking self-reports	CONCENTRATION/MEDITATION	Braud and Hartgrove (1976)
EXCESSIVE STRIVING TO RETRIEVE PSI INFORMATION	self-reports	INCUBATION PERIOD COVERT TESTING	Braud and Thorsrud (1976) Braud (1975)
INTERFERENCE BY TARGET-IRRELEVANT IMAGERY AND MENTATION	self-reports number and intensity of interfering impressions	DISCRIMINATION TRAINING WITH IMMEDIATE FEEDBACK	Braud and Wood (1977)

Eliminating informative inputs through conventional sensory channels should enhance internally generated imagery and any psi information carried via this imagery. An effective technique for eliminating patterned sensory information is the ganzfeld technique in which a constant, noninformative sensory field is presented to the subject. Experimentally, this may be accomplished by having subjects view a light source of uniform intensity through translucent acetate hemispheres placed over their eyes, while listening to uniform white noise through headphones. With visual and auditory stimulation regulated in this manner, subjects become more aware of ongoing imagery and mentation.

The visual and acoustic ganzfeld technique has shown promise as a psi-optimizing procedure. In a study by Honorton and Harper (1974), subjects under ganzfeld conditions followed instructions to

"think out loud" by giving continuous imagery reports. An agent in another room viewed a series of thematically related stereoscopic pictures during a randomly determined "sending" period. It was found that the content of the subjects' imagery corresponded dramatically with that of the target pictures. The target programs were correctly identified in 43 percent of the cases, which was significantly above the expected chance level of 25 percent. A systematic replication and extension of the Honorton-Harper study was conducted in our University of Houston laboratory (Braud, Wood, and Braud, 1975). Twenty undergraduate college students participated as subjects in the experiment. Ten subjects were assigned to a condition in which a visual and acoustic ganzfeld was maintained for a 35-minute period. A control group of ten subjects rested for an identical period of time, but without the unpatterned visual and acoustic stimulation. During the last five minutes of the session, all subjects attempted to gain psi impressions of a target picture viewed by an agent in another room. Significant psi-hitting occurred in the ganzfeld condition (i.e., the subjects' imagery content corresponded closely to the content of the target), while the control group showed chance performance. The psi scores of the ganzfeld group (ten hits, no misses) were significantly superior to those of the control group (five hits, five misses). Recently, a number of investigators in other laboratories have conducted ganzfeld experiments with impressive results. In reviewing the ganzfeld-psi literature, Honorton (1977) found that of the sixteen experimental studies, eight have yielded significant evidence for psi during ganzfeld stimulation.

Control of Somatic, Muscular Activity

A second source of psi-interfering noise appears to be the somatic, muscular activity of the body itself. Afferent stimulation from the striate muscle system may direct attention towards these inputs and away from weak psi signals. Reducing neuromuscular firing rate through progressive relaxation exercises or through electromyographic biofeedback should decrease the psi-antagonistic contribution of this particular noise source. Since a significant portion of our research effort has been in this area, our studies of the influence of muscle activity on psi will be reviewed here in some detail.

Our interest in relaxation as a possible psi-optimizing condition began with an as yet unpublished study of GESP during hypnosis. Our subject's good psi performance impressed us so much that we began to wonder what it was about hypnosis that made it so psi-conducive. Our first guess was that the muscular and mental relaxation

so characteristic of hypnosis might be a major factor. A review of the literature revealed that relaxation may indeed be a key factor in successful psi performance. Relaxation seems to be a reliable characteristic of the percipient in a majority of cases of spontaneous psi (Stevenson, 1970). Reference to the importance of relaxation is also found in the writings of and about nearly all "gifted sensitives" or "psychics"—individuals who are able to demonstrate psi with great frequency and accuracy. White (1964) has described the critical role of deep physical and mental relaxation, reduction of strain, increase of passivity, and stillness of mind in the successful performance of subjects in laboratory investigations. The nocturnal dream state, which investigators at the Maimonides Dream Laboratory have found to be quite conducive to psi (Ullman and Krippner, 1970), is characterized by extremely low muscle tension. Finally Gerber and Schmeidler (1957), in an ESP study involving hospitalized patients, obtained significant ESP scores from their relaxed and acceptant patients, but not from nonrelaxed, nonacceptant patients. Encouraged by these suggestions already in the literature, we decided to manipulate degree of relaxation directly and study the effect of this manipulation on receptive psi.

In Phase 1 of our research, we demonstrated that psi was greatly facilitated when our subjects attempted to receive psi impressions of targets while in a deeply relaxed state induced by a modified Jacobson's (1938) progressive relaxation technique. Seven exploratory experiments were conducted: one involving repeated tests of a single subject, one involving individual tests of six subjects, and five group tests. Subjects (selected only on the basis of indicated interest in the experiments) followed tape-recorded relaxation instructions for a twenty-five minute period. They then recorded their impressions of a color reproduction of a painting which was being viewed by a sensorily isolated agent. The subject-to-agent distance varied from a minimum of 78 feet and on another floor (separated by a closed door, a stairway, and another closed door) to a maximum of approximately 1400 miles (agent in Los Angeles, subjects in Houston). All possible sensory clues were eliminated before, during, and after the impression periods through the use of proper experimental techniques. Rational interference was eliminated by choosing the target pictures in a truly random way from a large pool of pictures. Correspondences between subject protocols and actual targets were rated blind by the subjects themselves and by naive judges who were unaware of the correct targets at the time of rating. In these preliminary relaxation experiments (the results of which are presented in Table 2), subjects'

TABLE 2

Summary of Results of First Seven Preliminary Relaxation Experiments

Experiment	Condition	Cases	Hits	Misses	% Hits	P	Direct Hits	% Direct Hits	P
1	Repeated tests of single *S*	6	6	0	100	.001	6	100	.001
2	Individual tests of six *Ss*	6	6	0	100	.001	6	100	.001
3	First group test	10	10	0	100	.001	7	70	.0002
4	Second group test	11	10	1	91	.006	6	54	.004
5	Third group test	10	4	6	40	n.s.	2	20	n.s.
6	Fourth group test[1]	6	4	2	67	n.s.	1	17	n.s.
7	Fifth group test[2]	11	11	0	100	.001	4	36	n.s.
Noncorrected Total (see text)		60	51	9	85%		32	53%	
Corrected Total (see text)		22	19	3	86%	.001	13	59%	.000007

[1] Smaller group with reporter present.—[2] Long-distance experiment (Los Angeles to Houston).—

impressions matched the correct targets at a significantly higher level than they matched five alternative control pictures which the agent did not "send." The overall results were associated with a probability of 7×10^{-6} and therefore indicated the successful operation of the psi process. Details of this series may be found in Braud and Braud (1973).

In Phase 2, we began to explore the role of relaxation in a more analytical fashion. Subjects were again tested while in a relaxed state. Before the correspondences were rated, all subjects indicated their degree of relaxation on a ten-point scale. When the subjects were later dichotomized at the median in terms of their psi performance, it was found that "good" psi performers were significantly more relaxed than were "poor" psi performers. Thus, subjects listening to the same relaxation-inducing taped instructions actually relaxed in different degrees and these degrees of relaxation were in turn related to degree of psi performance.

In Phase 3, we measured degree of relaxation objectively through use of electromyographic techniques. We also attempted to unconfound a number of factors which were not controlled in the first two phases. Two groups of ten subjects each were tested: one group listened to relaxation instructions as before, while the other group listened to instructions designed to induce a state of tension. Besides instructions for muscular relaxation (Jacobson technique), the relaxation tape included suggestions for mental quietude and passivity. The tension tape included instructions for systematically increasing muscle tension and instructions for mental alertness and activity. Both tapes included suggestions that the induced state

(relaxation for one group, tension for the other) was an optimal one for successful psi functioning. The purpose of this last manipulation was to equate expectancy of success in both groups. Electromyographic (EMG) activity was recorded throughout the session using a system similar to that described by Budzynski and Stoyva (1969) and Green, Walters, Green and Murphy (1969), with the important exception that feedback was not provided the subject. Electrical activity of the frontalis (forehead) muscle group was amplified, filtered, and displayed on an oscillograph and on a cumulative clock accurate to 1/100 sec. Recordings were taken during a five-minute baseline period, then during successive five-minute periods during which the subject followed the relaxation (or tension) instructions. Finally, EMG activity was recorded during the five-minute impression period. During this period, the subject attempted to receive psi impressions (via telepathy and/or clairvoyance) of an art print being viewed by a sensorily isolated agent. The targets were randomly selected from a large pool. After receiving impressions, but before recording them (on paper) and before judging protocol-target correspondences, each subject completed a questionnaire which was designed to determine certain subjective factors known to affect psi performance in an important manner. The questionnaire included three items which concerned belief in psi; four items concerning the subject's mood and attitude toward the experimenter, the experiment, and the target picture (not yet known to be the target picture at the time, of course); and nine items concerning the subject's "state" during various periods of the experiment. The state cluster included questions about the subject's feelings of physical and mental relaxation or tension at the beginning of the session and during the impressions period, about his belief that the induced state was conducive to psi functioning, and about his state of consciousness and body awareness during the impression period. Subjects self-rated each item on a ten-point scale.

Correspondences between subject protocol (written and drawn impressions) and target were quantified via a ranking technique. The subject was provided a pack of six pictures (art prints) which had been coded and randomized. One of these was the correct target which the isolated agent had viewed; the other five were alternative, control targets which had never been seen by the agent. No sensory contact occurred between subject and agent while the pack was being presented, nor were any sensory cues possible via the pack and envelopes and cards themselves. The subject compared his protocol with each of the targets and assigned a rank of 1 to the picture

corresponding best to that protocol. Ranks of 2 through 5 were assigned to pictures of intermediate correspondence, and a rank of 6 was assigned to the picture corresponding least to the protocol. No ties or omissions were permitted. A subject scored a "hit" if his actual target was assigned a rank of 1, 2, or 3; scores of 4, 5, and 6 were "misses." Since by chance equal numbers of subjects should score hits and misses ($p = \frac{1}{2}$), significantly more hits than misses (binomial test) would indicate the presence of psi effects in the data.

Although this experiment generated considerable data, only results which bear on the psi process will be presented here. The overall experiment yielded evidence for significant psi hitting: 15 subjects obtained hits, while 5 obtained misses, yielding a binomial probability of .021. Subjects following relaxation instructions performed significantly better on the psi task than did subjects listening to tension instructions. Relaxation subjects scored 9 hits and 1 miss (binomial $p = .011$), while tension subjects scored 6 hits and 4 misses (binomial $p = .377$). The psi performance of the relaxation subjects (mean score = 2.0) was significantly superior (Mann-Whitney $U = 21$, $p < .05$) to that of the tension subjects (mean score = 3.4). Over all 20 subjects, a significant positive Spearman rank-order correlation obtained between successful psi performance and (a) degree of EMG-defined relaxation during the impression period (rho = +.49, $p < .05$), (b) degree of self-rated physical relaxation during the impression period (rho = +.53, $p < .05$), and (c) degree of self-rated mental relaxation during the impression period (rho = +.49, $p < .05$). The relaxation and tension groups differed significantly ($p < .001$) in terms of EMG-defined relaxation, self-rated physical relaxation, and self-rated mental relaxation. It is important that the relaxation and tension groups did *not* differ significantly in terms of other, possibly confounding, variables which might have had important influences on the psi process (i.e., belief, mood, attitude, certain other states). Thus, the relaxation/tension effect was not confounded by differences between the two groups in expectancy or other relevant subjective variables.

A secondary finding was that EMG level, physical state rating, and mental state rating all intercorrelated significantly and positively (correlations ranged from +.57 to +.82; all with associated $ps < .01$), whether measured in terms of their initial values, their impression period values, or their degree of shift from beginning to end of the session. This indicates that subjects are accurately aware of their tension or relaxation levels and that their subjective ratings correlate well with objective bioelectrical measurements of the degree of

relaxation. Details of these studies may be found in Braud and Braud (1974).

Our work has been replicated and extended by Stanford and Mayer (1974). In their experiment, volunteer female students underwent a procedure (identical to our own) designed to induce deep mental and physical relaxation and to increase their expectancy of success on the psi task. Stanford and Mayer used a clairvoyance testing procedure in which subjects attempted to gain impressions of target pictures concealed in envelopes. Significant psi hitting occurred in their experiment. Recently, the use of progressive relaxation exercises as a psi-optimizing technique has been replicated by several other psi researchers and it is now frequently used as a component of other psi-conducive procedures.

In a review of the relaxation-psi literature, Honorton (1977) found that there have been 13 experimental studies of psi during induced relaxation. Ten of these studies gave significant overall levels of accuracy in target retrieval. Thus, induced relaxation does appear to be associated with psi receptivity.

Recently, two additional experiments have been conducted in our laboratory (Braud and Altom, 1976) which suggest the usefulness of relaxation exercises in facilitating clairvoyant impressions of auditory targets. In the pilot experiment, 30 subjects listened to a relaxation tape, then attempted to gain clairvoyant impressions of a musical target being played in a distant room. After the impression period, subjects listened to four musical selections, one of which was the correct target. The subject rank-ordered the four selections from most- to least-likely to be the target. Overall, there were 20 hits (target ranked first or second) and 10 misses (target ranked third or fourth), yielding a binomial $p = .028$. In the confirmatory experiment, which involved a slightly different experimental protocol, similar results were obtained ($N = 30$, $p(\text{hit}) = 2/5$, 23 hitters, 7 missers, exact binomial $p = 4.01 \times 10^{-5}$). A number of hits were qualitatively impressive. For example, one subject mentioned bagpipe music while the target selection was a bagpipe rendition of *Hieland Laddie*.

Control of Excessive Autonomic Activity

Attention may be directed away from weak psi signals by excessive activation of the autonomic nervous system, i.e., emotional noise and excess arousal. A "relaxed" autonomic nervous system may facilitate attention to psi-relevant imagery. What we are suggesting is that there may be an optimal level of arousal or activation for psi to

be processed, and that this level is lower than the level we may normally exhibit. There have been no direct tests of this hypothesis. However, evidence from several sources suggests that the hypothesis may be correct. Otani (1955) found good psi performance (in a clairvoyant ESP card guessing experiment) to be associated with high basal skin resistance, a psycho-physiological index of reduced autonomic activity. Anecdotal accounts and some laboratory evidence (Honorton, 1977) suggests that meditation may facilitate psi, and meditation is characterized by reduced autonomic arousal (Bagchi and Wenger, 1957; Wallace, 1970). Autogenic exercises (Luthe, 1969), as well as peripheral autonomic biofeedback (skin resistance, heart rate, skin temperature) may be useful in reducing autonomic noise and facilitating psi.

Although we have not yet tested the effects of autogenic training in isolation, we have had success in facilitating psi in a number of experiments in which autogenic exercises comprised part of our induction procedure. Braud and Thorsrud (1976) tested 16 subjects on a free-response GESP task after the subjects had listened to a psi-optimizing tape-recording in which autogenic exercises were a major component. The exercises included phrases for quietude, heaviness, warmth of extremities and solar plexus, coolness of forehead, and calmness and regularity of breathing and circulation. Twelve of the 16 subjects scored "hits" [p(hit) = ½] and 7 of the 16 subjects scored "direct hits" [p(direct hit) = ¼]; the binomial ps associated with these numbers of hits and direct hits are .038 and .05, respectively. Braud and Braud (1977) employed the same psi-optimizing tape recording in two experiments involving free-response clairvoyance of art print targets sealed in envelopes. Two percipients each contributed three sessions in a pilot study which yielded 6 hits and 0 misses (binomial $p = .016$); there were 4 direct hits (binomial $p = .038$). Next, 100 undergraduate students participated as subjects in a larger experiment involving the same psi conducive tape-clairvoyance protocol. This larger experiment yielded 63 hits and 37 misses ($CR = 2.60$, $p = .0047$); there were 36 direct hits ($CR = 2.54$, $p = .0055$). Thus, the tape as a whole appears to be psi-conducive. It remains to be shown, however, that the autogenic portion *alone* can optimize psi.

Let me describe a final observation involving autonomic "noise level." I recently completed two experiments (Braud, 1977) in which an "agent" in a different room attempted to psychokinetically influence the ongoing skin resistance (GSR) activity of "target" subjects. Each experiment yielded a successful outcome: the mean

GSR amplitudes were significantly higher during randomly selected periods in which the agent "wished" for activity to increase than they were during the randomly selected periods in which the agent wished for activity to decrease (*p*s of <.02, two-tailed, and <.01, one-tailed, for the pilot and confirmation experiments, respectively). Although the experiments were designed to study psychokinesis on living systems (with autonomic nervous system activity as the "target"), there were alternative ways in which psi may have manifested itself. The "target subjects" may have clairvoyantly or telepathically detected the "increase" and "decrease" target sequence and manifested this knowledge via appropriate autonomic responses. Thus, these could have been studies of receptive psi with the agent's target sequences and his cognitive and emotional activities serving as targets. General autonomic activation levels (and hence "noise levels") were calculated for the subjects in these experiments by summing the GSR amplitudes for "increase" and "decrease" periods. The subjects were rank ordered in terms of their autonomic noise scores (collapsing across the two experiments) and dichotomized at the median into "high noise" and "low noise" groups. A *t* test comparing the psi scores of these two groups yielded significantly higher scores for the "low noise" group ($p < .05$, two-tailed). This relationship may be artifactual since, according to the manner in which the psi scores were computed (the percentage of total GSR amplitude contributed by the "increase" period), the same absolute GSR change would produce a higher score in the low noise condition. However, one could argue that it would be correspondingly more difficult to produce such an absolute GSR change in the low noise group. Further research is required to resolve this ambiguity.

Control of "Mode 2" Noise

Evidence from a variety of sources (lesion and stimulation studies, split-brain research, dichotic listening experiments, and lateral eye movement research) suggests that man's two cerebral hemispheres are specialized for different modes of information processing (Dimond and Beaumont, 1974). The "dominant" hemisphere (the left, in right-handed persons) appears to excel in linguistic, mathematical, logical, temporal, abstract, sequential, and analytical skills. The "minor" hemisphere (the right, in right-handed persons) performs more poorly on the above, but appears to excel in tasks involving music, facial recognition, imagery, spatial performance, simultaneous processing, and holistic judgements. In this paper, we are using the

term "left-hemispheric" as a convenient shorthand to denote a particular cluster of cognitive or information-handling processes which are analytical, linear, and logical in character. Similarly, we use the term "right hemispheric" to refer to another set of processes —those which could be characterized as nonanalytical, holistic, nonlinear, alogical, and intuitive. Thus, we use the terms to refer primarily to *psychological processes, not brain loci*. In order to avoid implications or conclusions about brain structure which we do not intend to make, we will use the more neutral terms "Mode 1 functioning" and "Mode 2 functioning" to designate the nonanalytical and analytical clusters, respectively. Mode 1 functioning closely resembles a mode of consciousness described by Deikman (1971) and termed the "receptive mode," while our Mode 2 functioning is quite similar to what Deikman calls the "action mode."

Anecdotal observations suggest that analytical, interpretive, logical, linguistic Mode 2 functioning is antagonistic to good psi performance, while nonanalytical, noninterpretive, paralogical, nonlinguistic Mode 1 functioning is conducive to good psi performance. This hypothesis is suggested by the spontaneous reports of gifted psychics, sensitives, and laboratory subjects concerning how they seem to be functioning while performing well on psi tasks. The evidence in this area has recently been reviewed in a paper by Broughton (1975) and some experimental findings by Broughton (1976) and by Maher and Schmeidler (1976) are consistent with the hypothesis we are suggesting.

Some preliminary work has been conducted in our University of Houston laboratory (Andrew, 1975; Braud and Braud, 1975; Braud, Smith, Andrew and Willis, 1976), in which our strategy has been to attempt to evoke Mode 1 functioning in some of our subjects by involving them in nonanalytical, noninterpretive tasks such as listening to music and nonlinguistic sounds, solving spatial problems, appreciating depth, and imaging in visual, kinesthetic, and other modalities. In other subjects, we attempted to evoke Mode 2 functioning by engaging them in analytical, verbal, mathematical, and logical tasks. While our subjects were presumably functioning in these different modes, we tested their psi performance—sometimes using GESP procedures. The assumption was that the two modes of functioning are incompatible and that encouraging Mode 1 activity would inhibit Mode 2 noise and, hence, facilitate psi. Encouraging Mode 2 activity should contribute even more noise and interfere with good psi performance. Our preliminary results were consistent with our predictions and were quite encouraging. Subjects engaged in Mode 1

activity scored significantly above chance on the psi tasks employed, while subjects engaging in Mode 2 activity scored poorly (either at chance or significantly below chance).

There would seem to be three general strategies for increasing the dominance of Mode 1 over Mode 2 activity. The first strategy (illustrated by the work done in our own laboratory) is to "prime" or "evoke" Mode 1 functioning by presenting subjects with materials and tasks appropriate to that mode of processing information, then conduct psi tests during this priming period or immediately following the priming period while residual effects still endure. The second strategy (illustrated by Broughton's approach) is to pre-occupy the Mode 2 process by "keeping it busy" with activities appropriate to itself, freeing the Mode 1 process from its interference. The third strategy (which, to my knowledge, has not yet been attempted) is to "fatigue" the Mode 2 process by overactivating it, then conduct psi tests while it is momentarily "exhausted."

It should be borne in mind that experimental techniques which influence Mode 1 and Mode 2 functioning may also interact with the response systems or "vehicles" through which psi is manifested. This interaction should always be considered when attempting to make predictions about the net effect of a particular manipulation.

Control of Excessive Mental Activity

Physically reducing external stimuli (as in the ganzfeld procedure mentioned above) is one way of eliminating distraction, of allowing persons to attend to weak psi signals. Other distractions may be internal, in the form of excessive mental activity which is irrelevant to the task at hand—memories, anticipations, associations. A method of minimizing this noise source would involve training subjects to ignore distracting non-psi influences. This could be accomplished through the use of various concentration exercises, centering devices, and meditation. Subjects might participate in a training program in which they learn to control their normally wandering minds by concentrating upon specific physical objects, mandalas, breathing, mantras, thoughts, or images. This acquired control of attention could then be directed at weak psi impressions. Various meditative techniques might be used to still the mind, reducing distracting thought-ripples that might disrupt retrieval or access to weak psi signals. It is interesting to note that these very ideas (about distraction and concentration and their relation to psi) were presented in a very systematic and sophisticated manner centuries ago by the

founders of yoga, zen, and other formal meditative systems (see, for example, Patanjali's *Yoga Aphorisms*, as presented by Prabhavananda and Isherwood, 1953).

In reviewing the meditation-psi literature, Honorton (1977) finds that of 16 experiments conducted, 9 were independently significant at the .05 level or lower, whereas 0.8 significant experiments would be expected on the basis of chance error. Thus, meditation does appear to be associated with efficient psi performance.

We have recently completed an exploratory study of clairvoyance and psychokinesis in long-term practitioners of Transcendental Meditation and in a matched control group of nonmeditators (Braud and Hartgrove, 1976). For the PK task, the subjects attempted to influence a Schmidt random event generator (without feedback) while meditating or resting. For the clairvoyance task, the subjects attempted to gain impressions of a 35 mm slide concealed in an opaque envelope; this clairvoyance task occurred while the subject was terminating his or her meditation or rest. Ten meditators and ten nonmeditators participated in the study. The meditators had been meditating regularly for at least 18 months (range: 18 to 60 months; mean: 32 months). The nonmeditators were solicited from among persons in attendance at introductory lectures on TM. These persons were not yet meditators, but were assumed to have personality and interest characteristics similar to those of the meditators.

On the clairvoyance task, the meditators scored higher than the nonmeditators ($p = .024$); however, neither the performance of the meditators nor that of the nonmeditators differed significantly from chance. The meditators and nonmeditators did not differ significantly on the PK task. Combining scores of the two groups yielded significant psi missing overall ($p = .034$); however, neither the performance of the meditators nor that of the nonmeditators differed significantly from chance when assessed independently. To determine whether the amount of prior experience with meditation was related to ESP performance, a Spearman rank-order correlation coefficient was calculated for number of months of regular TM practice vs. clairvoyance score. A correlation of +.51 was obtained, which was not quite significant for the small sample size of ten subjects. The magnitude of the correlation is quite encouraging, however.

Since J. H., as experimenter, was unaware of the contents of the target slides inside of the envelopes, she attempted to gain clairvoyant impressions of these targets herself, during activity-free periods while she was testing the subjects. During the 5-minute impression

periods, J. H. meditated (using the TM techniques which she had been practicing regularly for 54 months at the time of the experiment) and noted, remembered, recorded, and coded her spontaneous imagery during those periods. The clairvoyance scores for J.H.'s 20 trials, collected during the tests of each of her 20 subjects, were independently significant ($p = .0055$). There were 13 hits, 4 misses, and 3 chance scores, with no evidence of a decline apparent in her scores (see Figure 2). Thus excellent results were obtained with one "selected" Transcendental Meditator, and suggestive results were obtained with a group of 10 unselected meditators.

Control of Noise Produced by Excessive Striving To Retrieve Psi Information

A consideration of this noise source involves the assumption that, in certain situations, poor psi performance may be due to a "retrieval" failure or difficulty similar to the sort that occurs in the case of conventional memory. The information may be present (stored), but momentarily inaccessible to the individual attempting to recall it. In memory research, this state of affairs is called a "tip-of-the-tongue" phenomenon (Brown and McNeil, 1966). Active attempts to retrieve information which is on the tip of the tongue are not only ineffective, but actually seem to interfere with recall

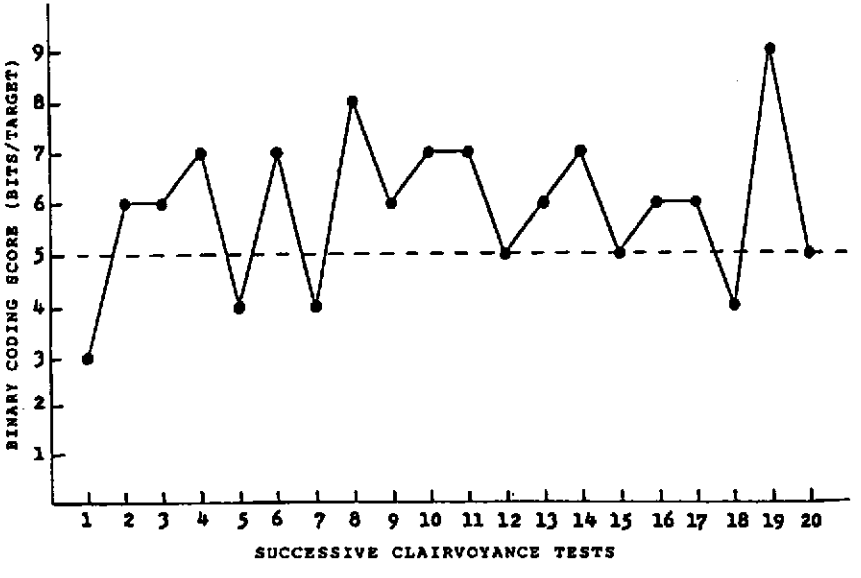

Figure 2. Psi scores for twenty clairvoyance tests for a selected meditating subject, J.H.

and are accompanied by a distinctly disagreeable feeling tone. Quite frequently, the correct information spontaneously comes into consciousness after one has stopped actively trying to retrieve it and has turned his attention away from the problem and towards some other, relatively undemanding activity (i.e., during an "incubation period"). An analogous process may operate in the case of psi. The very act of striving to retrieve the correct psi impression may contribute noise which interferes with success. The introduction into a psi experiment of an incubation period in which active striving to retrieve is minimized may allow additional material related to the target to come into consciousness in a more spontaneous manner, information which might otherwise be filtered out of awareness by the very effort of trying.

In an experiment by Braud and Thorsrud (1976), subjects were asked to attempt to gain psi impressions of a pictorial target viewed by an agent in another room. There followed a 15-minute incubation period in which the subject was to stop trying to receive impressions but rather was to occupy himself with some relatively undemanding activity (a motor-coordination task performed alternatively with the left and right hands). It was hoped that during this incubation or rest period, additional target-relevant material might come to consciousness spontaneously, and that such information could be verbalized in a subsequent inquiry about impressions of the target. Although significant psi-hitting occurred in these 16 subjects (see further discussion of this experiment above, in the section on autogenic exercises), no *change* in psi scores occurred following the incubation period. We suspect that the brevity of the incubation period and the use of this particular type of within-subject design may have been responsible for our lack of results. A between-subjects design employing a much longer incubation period certainly should be exploited in future work, and we are planning another experiment along those lines.

An alternative way to eliminate or minimize excess striving is to test subjects for psi *covertly*. If subjects are not aware that they are participating in a psi experiment, this particular noise source might be greatly reduced. This approach has been taken by Stanford and his associates in their recent ingenious tests of his "psi-mediated instrumental response (PMIR)" model (Stanford, 1974). Stanford's experiments are arranged so that his subjects enter either pleasant or unpleasant conditions depending upon whether or not their behavior satisfies certain contingencies of which they are not aware. A number of other psi researchers have devised various unconscious or

disguised psi tests which, I believe, might be pursued fruitfully. One of these is Johnson's (1973) method for testing clairvoyance in the context of an academic examination. Here, it was found that clairvoyance of hidden answers to an examination occurred when subjects were consciously unaware of the existence of those targets. I recently had the opportunity to replicate and extend Johnson's experiment in one of my classes at the University of Houston. Undergraduate students in a parapsychology course were administered an examination in which, unknown to them, answers to certain of the questions were hidden within the envelopes upon which their question sheets were stapled. The envelopes also contained target sheets for another clairvoyance test, of which they were aware. In both the pilot and confirmation, the 46 subjects scored significantly better on the questions for which hidden correct answers were supplied. A significant positive correlation was found between the degree of "good" unconscious clairvoyance and the number of errors on a "conventional knowledge" portion of the exam. Thus, students with less knowledge of course content may have utilized psi more effectively than students with better knowledge of course content. The conscious clairvoyance task, on the other hand, revealed no evidence of psi. Perhaps the conscious striving to do well on the latter task was accompanied by noise which interfered with successful performance. Details of the study may be found in Braud (1975).

Control of Target-Irrelevant Mentation

If the various techniques mentioned above, alone or in combination, successfully reduce noise and increase a percipient's likelihood of attending to otherwise unnoticed psi information, the percipient's task then becomes one of recognizing which of his psi impressions relate to the target at hand and which relate to nontarget events. In other words, there may be "noise" within the psi process itself. A technique which might allow a percipient to discriminate target-relevant from target-irrelevant impressions would be to provide immediate feedback for "correct" (i.e., target-relevant) responses emitted during an experimental session. Such immediate feedback for psi "hits" could result in two outcomes: (a) an increase in the probability of hits (since these are immediately, positively reinforced), and (b) the gradual development of an ability to recognize subtle internal cues associated with target-relevant information and hence increased feelings of confidence about whether a given impression is correct or not. The immediate feedback may permit the percipient to learn to

characterize his subjective experiences and acquire a "feel" for those aspects of his mentation which are likely to be target-relevant impressions. When his awareness of subtle target-relevant psi cues has been acquired, feedback can be eliminated (or the "reinforcement schedule" shifted) to determine whether the percipient can maintain his awareness in the absence of "reinforcement contingencies"; i.e., whether learning has occurred.

Tart (1975) has provided a review of the experimental literature dealing with the effects of immediate feedback upon psi functioning. He concludes that (a) immediate feedback of results stabilizes ESP performance, eliminating decline/extinction effects for short to moderate length experiments, (b) some subjects show increasing performance with repeated practice under conditions of immediate feedback, and (c) the greater a subject's ESP ability, the more improvement is expected. These conclusions were derived from studies utilizing restricted-response designs.

We have recently extended the immediate feedback paradigm to a free-response design (Braud and Wood, 1977). Percipients were tested under the sensory-restriction or ganzfeld condition which recent research (discussed above) suggests is psi-conducive. The design involved two independent groups of percipients ($n_1 = n_2 = 15$) who attempted to gain GESP impressions of 35 mm slides viewed by an agent in another room. Each percipient was asked to bring to the lab a person with whom she or he felt particularly close to serve as agent. The series for experimental (immediate feedback) percipients was as follows: a no-feedback pretest (5 min.) which followed 30 minutes of ganzfeld stimulation produced by acetate hemispheres and white noise; four practice sessions, each consisting of two feedback periods (15 minutes each) followed by a no-feedback test (5 minutes), all conducted during ganzfeld stimulation; then a no-feedback posttest identical to the pretest. The percipient's experimenter remained in the room with the percipient and copied his or her mentation reports which were spoken aloud continuously throughout the sessions. The agent and agent's experimenter listened to the mentation reports (through a one-way intercom) while watching the projected target slides and provided the percipient with "immediate" feedback (a 2 sec. 180 Hz. audible tone) for any mention of some content of the target slide. The target pool consisted of the 1024 slides of Honorton's (1975) recently devised binary target system, from which targets were selected through use of a random number table. At the end of a session, the percipient coded the content of his or her mentation according to the ten categories of the binary system and then rank-

ordered four slides (the target plus three randomly selected alternative slides never seen by the agent's experimenter, delivered to the percipient's room without the possibility of sensory leakage) from most ("1") to least ("4") similarity to his or her impressions. The agent or agent's experimenter then entered the room and revealed the identity of the correct target. The series for control (no feedback) percipients was identical, with the exception that feedback was never provided during the practice sessions.

While a substantial amount of data was collected on psychological variables (mood, attitude, state of consciousness, etc.) using various questionnaires and scales, only data relevant to psi performance will be presented here. Three psi measures were recorded in the experiment: binary code for impressions mentioned during the target-exposure period, binary code for all impressions mentioned during the entire session, and target ranking.

The important conclusions to be reached from the data collected in the experiment are that, for the exposure period binary coding measure, the feedback and control groups evidenced no psi during the pretest and did not differ from each other. By the time of the posttest, the feedback group had improved significantly, now evidenced psi-hitting, and was significantly superior to the control group, which still showed no psi and did not differ from its pretest value. Similar trends are seen in the other two psi measures, but the pre- to post- improvement of the feedback group does not reach significance, nor does the feedback-control posttest difference. Two unexpected findings were (a) the control group's psi-missing during the pretest on the target ranking measure and that group's marginally significant change from pretest to posttest, and (b) the lack of psi-hitting in all subjects during a pretest conducted under ganzfeld conditions which should have been psi-conducive. Combining *all* no-feedback test scores (exposure period binary codes) for all percipients across all sessions yields significant evidence for the presence of psi-hitting in the experiment as a whole for feedback ($t = 5.09$, $p < .0002$) and control ($t = 2.32$, $p < .04$) subjects.

The feedback group's significant improvement from pretest to posttest does not seem to reflect a general habituation to the testing conditions, since such a factor should also influence the control group. We believe the improvement reflects a learning effect attributable to immediate feedback, but a psi-mediated experimenter effect remains a viable alternative explanation for these results, which are graphically portrayed in Figure 3.

We might note another aspect of the design that may have contributed to the success of our subjects. Since the percipients'

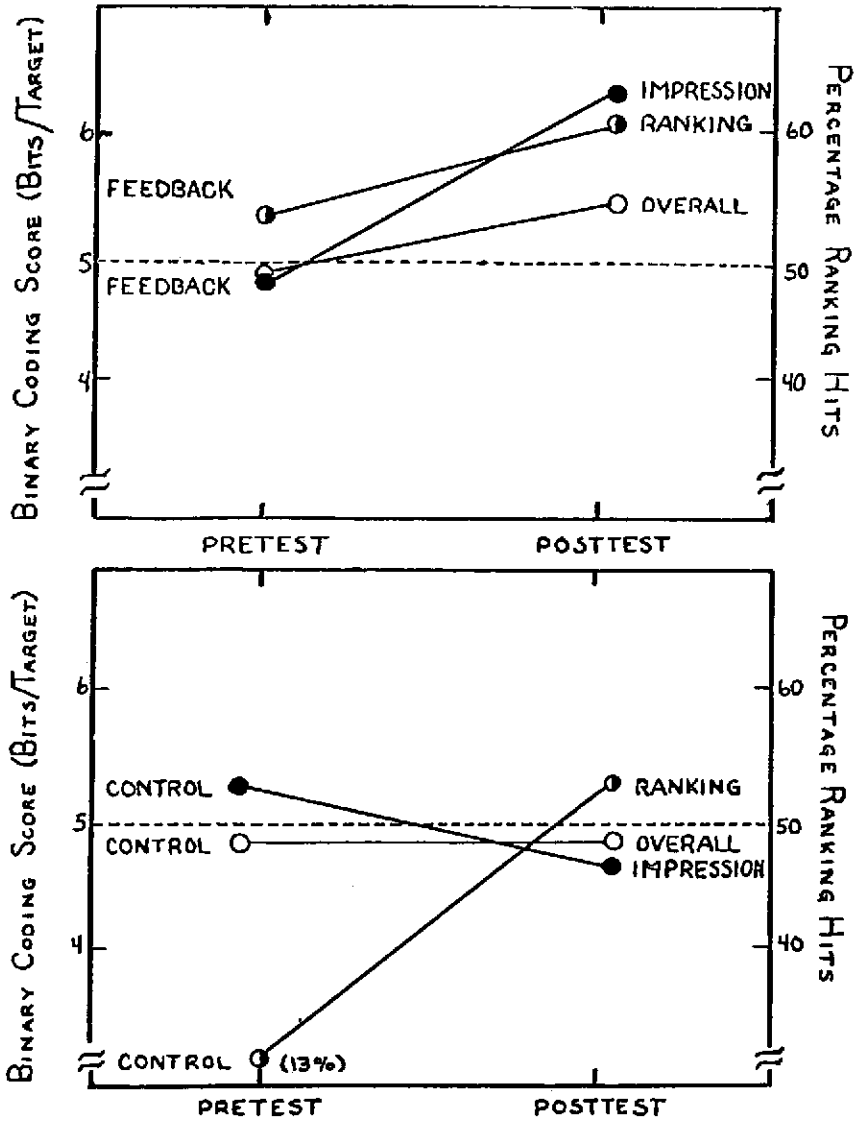

Figure 3. Pretest and posttest psi scores for Feedback and Control subjects.

verbalizations could be heard through a one-way intercom by the agents and the agents' experimenters, we were providing full feedback to the "sending team" as well as to the percipient. Thus, we were providing the agents an opportunity to learn to "send" better while we were providing the percipients an opportunity to

learn to "receive" better. Tart (1975) has pointed out the theoretical and practical significance of such a "double feedback" procedure. It should be noted, however, that feedback to the agents occurred in both the feedback and nonfeedback conditions, since all "sending teams" listened to the percipients' ongoing mentation reports through the intercom, whether they provided feedback or not.

Support for the Noise-Reduction Model

A model has been described in which psi is conceptualized as a weak "signal" which is usually masked by "noise" which may arise from a number of different but highly correlated sources. Seven sources were described, along with suggested experimental techniques for reducing their influence. Evidence was presented which indicated that the techniques do indeed appear to be associated with accurate psi performance in a laboratory setting. Additional evidence in support of the model is presented in Charles Honorton's contribution to this conference.

In order to test the model more thoroughly, what is needed now is a systematic research program which is devoted to: (a) objectively measuring the levels of noise in the various sources, (b) determining whether there is indeed a negative correlation between noise level and accurate psi performance, (c) determining the relative efficiency of the various techniques in actually reducing noise intensity, (d) determining whether noise-reducing techniques summate in their effectiveness, and (e) determining whether noise-*incrementing* techniques reduce psi performance in the laboratory. Would the prolonged and diligent practice of the noise-reducing techniques outside of the laboratory greatly improve the psi abilities of the practitioner? And what about *nonpsi* effects? Is the practice of the noise-reducing, psi-optimizing techniques outlined in this paper beneficial to general physical and mental well being? There already exist indications that three of the techniques (progressive relaxation, autogenic exercises, and meditation) do promote physical and psychological well being. Is this true of the other techniques as well? If so, this would suggest that effective psi functioning is simply one of a number of characteristics of a healthy, well-integrated personality, and that factors contributing to the development of the latter should also contribute to psi effectiveness.

Why is Noise Reduction Effective?

Improved access to "psi signals." The most straightforward interpretation of the findings discussed above is that the diminution of noise

levels somehow facilitates detection of or access to "psi signals" themselves. Such a position would seem to presuppose the existence of a special "psi modality" (analogous to a conventional sensory modality) with its own unique medium, channel, detector, and processing mechanisms. It seems doubtful that this is the case.

Improved access to psi-mediating vehicles. A second interpretation is that psi consists not in a "transfer of information" from target to percipient, but rather in a specific type of relationship between target- and percipient-characteristics. When the psychological, behavioral, or phenomenological characteristics of a percipient happen to share a close correspondence with the characteristics of a target or with the reaction pattern that would occur were the percipient actually exposed to the target in a conventional way, psi is said to occur. Factors which maximize the detection of subtle sensations, perceptions, memories, images and feelings should facilitate detection of correspondences and hence facilitate psi.

Tyrrell (1946) described imagery as the *modus operandi* of paranormal cognition. Roll (1966) suggested that memory images are the "sense data" of ESP. If subtle images, thoughts, and feelings are the vehicles which convey psi information into consciousness, noise-reducing techniques which facilitate detection of the mediating vehicles should also facilitate psi awareness. Conscious awareness usually is necessary for the communication and verification of psi.

We would expect free-response GESP (in which the generation and detection of imagery plays an important role) to be aided by techniques which facilitate imagery and protect it from disruption. Similarly, techniques which facilitate retrieval of memories should be conducive to psi effects which are mediated primarily by memory images. But what about psi effects which are manifested *unconsciously*? What about PMIR effects, and psi manifestations involving autonomic or electroencephalic events of which the subject is unaware? Would unconscious and unintentional forms of psi be facilitated by the types of noise-reducing manipulations we have been discussing?

Increased susceptibility to "conformance behavior." At last year's conference (1976) and in a recent publication (1977), Rex Stanford elaborated a theory of "conformance behavior" which promises to be quite useful in furthering our understanding of the effectiveness of noise-reducing techniques. Several elements are involved in cases of conformance behavior. One element is a *disposed system*. Another element is the *possibility of a favorable event*, an event which can satisfy the disposition, allow the disposition to be actualized. Another element is a *source of incompletely determinate alternative states (or events)* —i.e., some species of random event generator (REG). The final

element in conformance behavior is a *contingent relationship* such that the probability of a favorable event is linked to the REG outputs. When these four elements are present, and when the REG outputs become biased so as to increase the probability of the favorable event, conformance behavior is said to occur.[4] According to this theory, in cases of receptive psi, the REG which exhibits conformance behavior is the nervous system of the organism being tested, and it becomes biased such that outputs are selected which will produce a match with the target event. Factors which increase the number of possible alternative states of REG (increase its "randomicity") should make a system more susceptible to conformance behavior and hence to psi interactions. Noise-reducing procedures may be psi-conducive to the extent that they free the nervous system from external and internal constraints, thereby increasing its alternative possibilities ("randomness") and hence its susceptibility to conformance behavior. Before this suggestion can be properly tested, it will be necessary to develop adequate measures of the "randomicity" or "lability" of the nervous system. Then it will be possible to determine whether the various noise-reduced conditions are indeed associated with increased central nervous system "randomness."

Factors which increase "noise" are assumed to increase internal and external constraints upon nervous system activity, decreasing the degrees of freedom of the system and causing it to function as a more sluggish or inert REG. The possibility of conformance behavior (and hence, of psi) would vary inversely with the degree to which the system is subjected to structuring inputs. In short, the noise-reducing techniques we have been discussing may facilitate psi to the extent to which they "destructure" the nervous system and allow the latter to be "restructured" in congruence with target events according to the conformance principle.

Some Alternative Interpretations

In the preceding discussion, we have been assuming that the effectiveness of the various psi conducive techniques could be attributed to their noise-reducing properties. However, other aspects of the noise-reduction experiments may have contributed to their success.

"Psychological" changes associated with the procedures. A given noise-reducing technique might not only reduce noise, but might also produce certain other psychological changes in the subject which are themselves psi conducive. A technique may alter the mood, interest, or attitude of the subject in a direction consistent with good

psi performance. A technique may induce what Ehrenwald (1971) has called an "existential shift" or a shift from what LeShan (1974) calls "the Sensory Reality" (in which psi is not believed to be possible and in which it does not occur) to what he calls "the Clairvoyant Reality" (in which psi is believed possible and does occur).

Ritualistic aspect. A psi-conducive procedure is a ritual, one which the investigator believes will improve a subject's psi performance. This belief in the effectiveness of the procedure may be communicated to the subject in an obvious or not so obvious manner. Once convinced of the effectiveness of the procedure, belief and confidence in a favorable outcome are increased. To the extent that belief and confidence are conducive to good psi performance, psi scores should increase. Belief in the effectiveness of some procedure may also result in a decrease in what Batcheldor (1966) and Brookes-Smith (1973) call "ownership resistance" (which is assumed to interfere with psi) and a decrease in "egocentric striving" (which may also be psi antagonistic). Trusting in the effectiveness of the ritual, a subject is more likely to feel at ease in the testing situation, more likely to "flow" with his experiences and less likely to feel defensive or threatened about exhibiting or failing to exhibit psi. The subject can feel less personal responsibility for successes and failures than he might without the support of the ritual.

Conventional experimenter effects. The laboratory's physical environment, its "atmosphere" and the manner in which laboratory personnel interact with the subject are all potential influences on the outcome of an experiment. These factors are especially crucial in "demonstration" studies which lack contrasting control conditions. Unfortunately, the majority of reports of research on psi-conducive procedures describe demonstrations rather than analytical experiments.

Of course, one may attempt to equate these "extraneous factors" for all groups or conditions, or attempt to assess them through the use of questionnaires, etc. There may exist, however, subtle influences which escape detection by these devices.

A related issue is the type of subject population used in psi conducive state research. This point has recently been made, in print, by Rogo (1976). The issue of unique subject characteristics is especially important in cases in which great reliance is placed upon a small group of volunteers who are tested repeatedly in many of the experiments conducted in a given laboratory.

Psi mediated experimenter effects. The experimenter (or another person involved in the experiment, other than the "subject") may influence the outcome of an experiment through psychic means. This

problem is beginning to assume prominence in current psi research and has been recognized in a number of recent publications (e.g., Kennedy and Taddonio, 1976; White, 1976). Psi mediated experimenter influences may enter an experiment at a large number of points. Although one can never be certain whether a given "entry point" does or does not carry such an influence, we can identify specific entry points as being more or less susceptible to experimenter psi. Certainly, there are some possibilities we cannot control (e.g., an experimenter unconsciously PK-ing his subjects to arrive at the laboratory at specific times, so that they are assigned to conditions in a biased manner so as to yield results consistent with his hypothesis). It would seem, however, that there are other sources of ambiguity which could be minimized. One such source of ambiguity, present in a number of experiments on psi-conducive procedures (and in a large number of psi experiments in general) is the use of an indeterministic target selection process *on each and every trial* of an experiment. It would seem that such a target selection process is more susceptible to a psi mediated experimenter influence than one based upon a random sequence which has been preset or prespecified by some event occurring once and only once and occurring some time before a particular experiment is conducted.

Perhaps an illustration may help clarify this point. Suppose Investigator X hypothesizes that Procedure Y is psi-conducive. He designs an experiment in which certain subjects are exposed to this procedure and others are exposed to a "control" Procedure Z. Suppose further that a free-response GESP method is used to assess psi effects. On each trial, for each subject, the experimenter selects a target using an "indeterministic" method (pressing a button on an electronic RNG, throwing dice, shuffling cards, etc.). It is possible that the target-selection procedure is really random and that any psi effects observed can really be attributed to the *subject's* psi and to the efficacy of Procedure Y. However, it is also possible that the *experimenter* psychically becomes aware of what the subject's response protocol will be for a given trial and influences the target selection procedure via ESP or PK so that a target is selected which closely corresponds to his protocol. The experimenter may (unconsciously) do this more often on Procedure Y trials than on Procedure Z trials. The resultant higher psi scores of the subjects exposed to Procedure Y may be completely unrelated to that procedure and, in fact, the subjects themselves may contribute no psi at all to the outcome of the experiment. A target-selection procedure allowing the experimenter fewer "degrees of freedom" (e.g., "randomly" accessing a RAND

table of random numbers *only once* and using the sequence, which has been thereby fixed, to specify a *large number* of subsequent target, subject, and condition decisions, even across experiments) would appear to minimize the particular experimenter effect just described. It is recognized that some "slippage" still exists and that this proposed methodology makes certain assumptions about the *limits* of experimenter psi. My motive for making this suggestion at this time is not to recommend a specific methodology as being "better" than others, but rather to focus attention upon a particular issue and stimulate serious discussion of a seldom discussed ambiguity in psi-conducive research findings.[5]

Further, it is recognized that there does exist a position according to which a psi experiment is treated as a gestalt and which views attempts to conclusively "localize" psi influences as misguided. The challenge confronting parapsychologists in the years to come will be: how can one reconcile such a "field" view (which seems to me to be a very reasonable interpretation of what really occurs in a psi experiment) with the equally desirable goal of process-oriented research, which presupposes analytical experiments.

A Methodological Note

In two recent publications (Wood, Kirk, and Braud, 1977; Braud and Braud, 1977), I mentioned a hypothesis which, if correct, may have considerable bearing on research on psi-conducive procedures. In discussing this hypothesis informally with a number of parapsychologists, I learned that a considerable number of them had themselves entertained similar ideas. I present here, for your consideration, a brief outline of the hypothesis, which is still in its earliest stage of development and which will not be completely elaborated until a number of experimental tests of its implications have been completed.

The hypothesis (which might be informally called a "spreading thin" hypothesis) suggests that for a given person, for a given time period, there exists only a definite "quantity" of psi; more accurately, there exists a definite quantity of *availability* of psi. If some of this quantity is "expended" in a certain place, at a certain time, or to create a certain effect, then it is no longer available to be expended elsewhere. This hypothesis has certain implications for the *distribution* of psi effects in experimental designs. A simple design, such as a "demonstration" study with only one condition, would be expected to yield a large psi effect since such a design includes only one "op-

portunity" for the manifestation of psi. With increasing complexity of the experimental design, it becomes increasingly likely that the available "quantity" will become distributed throughout the various conditions, with a consequent "watering down" of psi effects in the separate conditions. In a quite complex design, the psi quantity may be "spread so thin" that psi effects in the individual conditions may not be evident.

The locus of expenditure of psi is assumed to depend upon the importance, meaningfulness, or interest of specific effects to the experimenter (especially in independent subjects designs) or to the subject (especially in within-subjects designs) or to both; i.e., the individual whose "psi quantity" is being considered may be the experimenter or the subject or some other person involved in the experiment. If the major contributor of the psi effects of an experiment is the experimenter, he may obtain the results that are most important to him, but perhaps *at a cost*. This cost may be the disappearance or reduction of psi effects at other places in the experiment. Palmer (1976) has made a similar observation in discussing the result of an experiment by Smith, Tremmel, and Honorton (1976). In that experiment, psi occurred in a new and important experimental condition (tachistoscopic presentation of a target to an agent), but not in one in which psi had been occurring in many previous experiments in the Maimonides laboratory (viz., long duration exposure to the target). Similarly, in one of our own experiments (Braud and Wood, 1977) psi effects occurred in a new and important condition (following feedback training in a free-response context), but not in another condition which had been yielding consistent psi effects in prior experiments (viz., ganzfeld stimulation tests without feedback).

The relevance of all of this for research on psi-conducive procedures is that the low magnitude of a psi effect in a "control" condition may be due not to the non-psi conduciveness of the procedure itself, but rather to the fact that the control is simply a second condition and one that is of less importance to the experimenter (or to the subject, if he knows about the various conditions) than is the psi-conducive condition (regardless of its nature). The success of a demonstration of a psi-conducive procedure may be attributed not to some intrinsic psi-conduciveness of the procedure itself, but rather to the fact that all available subject- and experimenter-psi is channeled into one place at one time. Control conditions may "water down" psi (both in themselves and in the experiment as a whole) because they provide additional "sinks" for the limited psi

accessibility quantity available at that time to the participants in the experiment. Methodologies are available which may allow the determination of the precise role of the hypothetical "spreading thin" factor in any given experiment, but space does not permit their discussion at this time.

The validity of the "spreading thin" hypothesis must be assessed by means of careful inspections of psi distribution effects in extant studies, as well as by means of the results of specially designed new experiments in which the complexity of the experiment (number of "sinks") and psi availability (number of psi "sources") are directly manipulated. Investigations of such phenomena as decline effects and differential effects may yield data which are especially relevant to the hypothesis. These sorts of experiments will allow us to determine whether experiment complexity itself is the major contributor to the effect or whether (as Rex Stanford has suggested in a personal communication) the perceptual or motivational sequelae of task juxtaposition play important roles.

Summary

I have reviewed laboratory research on various procedures which are believed to be psi-conducive. While psi does manifest itself, sometimes quite dramatically, in the hands of investigators employing these techniques, it is not clear that the techniques themselves are responsible for the high levels of psi obtained. Unfortunately, most research on psi-conducive conditions is not sufficiently analytical to allow us to distinguish fact from artifact. We appear to be at a stage of development in psi research in which we have a general recipe which yields rather efficient paranormal functioning. The recipe includes: experimental techniques with their many recognized and perhaps some as yet unrecognized features, particular experimenters who employ the techniques, particular kinds of volunteer subjects, largely unspecified interactions between the experimenters and subjects, and a complex set of beliefs, expectations, attitudes, and moods existing in all participants in the experiments. We do not yet know the relative contributions of each of the ingredients of this recipe.

Japanese philosophers and poets frequently express their perception and understanding of reality in a three-line, seventeen-syllable poetic form called "*haiku*". If a contemporary *haikuist* were to apply his art to a description of current parapsychological research, the result might be something like this:

Catching a greased pig
with gloves filled with quicksilver:
psi experiments.

FOOTNOTES

1. Rex Stanford's (1974a,b) "psi mediated instrumental response" work is a refreshing exception. Here, the concern is not so much with how well an individual's "psi perception" matches his sensory perception, but how psi functions unintentionally, unconsciously and *motivationally* in his everyday life.
2. Charles Tart (1972) has suggested a methodology (which might be useful here) in the context of his discussion of "state specific sciences."
3. This incident is a fictionalized and embellished version of one described to me some years ago by a fellow parapsychologist.
4. It is interesting to compare the four elements of Stanford's theory with the "need/drive," "incentive," "response hierarchy" and "reinforcement contingency" elements of Hull's (1943, 1952) learning theory, and with the "source," "impetus," "object" and "aim" elements of Freud's (1905) instinct theory. Comparisons of the "conformance behavior" concept with Jung's "synchronicity," Leibniz's "monadology," and certain aspects of Taoist and Vedantist philosophy also suggest themselves.
5. The importance of this particular ambiguity was recently brought to my attention by Rex Stanford, who deserves credit for the thoughts expressed in this paragraph.

BIBLIOGRAPHY

Andrew, K., "Psychokinetic influences on an electromechanical random number generator during evocation of left hemispheric vs. right hemispheric functioning," in Morris, Roll, and Morris (Eds.) *Research in Parapsychology 1974*, Metuchen, N. J., Scarecrow Press, 1975, 58–61.

Bagchi, B. K. and Wenger, M. A., "Electro-physiological correlates of some yogic exercises," *Proceedings of the First International Congress of Neurological Sciences*, 1957, 3, 132–149.

Batcheldor, K. J., "Report on a case of table levitation and associated phenomena," *Journal of the Society for Psychical Research*, 1966, 43, 339–356.

Braud, L. W. and Braud, W. G., "Further studies of relaxation as a psi conducive state," *Journal of the American Society for Psychical Research*, 1974, 68, 229–245.

Braud, L. W. and Braud, W. G., "Clairvoyance tests following exposure to a psi-conducive tape recording," *Journal of Research in Psi Phenomena*, 1977, 2 (1), 10–21.

Braud, W. G., "Conscious vs. unconscious clairvoyance in the context of an academic examination," *Journal of Parapsychology*, 1975, 39, 277–288.

Braud, W. G., "Allobiofeedback: Immediate feedback for a psychokinetic influence upon another person's physiology," Paper presented at the 20th Parapsychological Association Convention, Washington, D. C., 1977.

Braud, W. G. and Braud, L. W., "Preliminary explorations of psi-conducive states: Progressive muscular relaxation," *Journal of the American Society for Psychical Research*, 1973, 67, 26–46.

Braud, W. G. and Braud, L. W., "The psi-conducive syndrome: Free response GESP performance following evocation of left hemispheric vs. right hemispheric functioning," in Morris, Roll, and Morris (Eds.) *Research in Parapsychology 1974*, Metuchen, N. J., Scarecrow Press, 1975, 17–20.

Braud, W. G. and Hartgrove, J. L., "Clairvoyance and psychokinesis in Transcendental Meditators: A preliminary study," *European Journal of Parapsychology*, 1976, 1, 6–16.

Braud, W. G., Smith, G., Andrew, K. and Willis, S., "Psychokinetic influences on random number generators during evocation of 'analytic' vs. 'nonanalytic' modes of information processing," in Morris, Roll, and Morris (Eds.), *Research in Parapsychology 1975*, Metuchen, N. J., Scarecrow Press, 1976, 85–88.

Braud, W. G. and Thorsrud, M., "Psi on the tip of the tongue: A pilot study of the influence of an 'incubation period' upon free response GESP performance," in Morris, Roll, and Morris (Eds.) *Research in Parapsychology 1975*, Metuchen, N. J., Scarecrow Press, 1976, p. 167–171.

Braud, W. G. and Wood, R. C., "The influence of immediate feedback upon free-response GESP performance during ganzfeld stimulation," *Journal of the American Society for Psychical Research*, 1977, 71, 409–428.

Braud, W. G., Wood, R. C. and Braud, L. W., "Free-response GESP performance during an experimental hypnagogic state induced by visual and acoustic ganzfeld techniques: A replication and extension," *Journal of the American Society for Psychical Research*, 1975, 69, 105–113.

Broad, C. D., *Religion, Philosophy, and Psychical Research*, New York, Harcourt, Brace and Co., 1953.

Brookes-Smith, C., "Data-tape recorded experimental PK phenomena," *Journal of the Society for Psychical Research*, 1973, 47, 69–89.

Broughton, R., "Psi and the two halves of the brain," *Journal of the Society for Psychical Research*, 1975, 48, 133–147.

Broughton, R., "Brain hemisphere specialization and its possible effects on ESP performance," in Morris, Roll, and Morris (Eds.) *Research in Parapsychology 1975*, Metuchen, N. J., Scarecrow Press, 1976, p. 98–102.

Brown, R. W. and McNeil, D., "The 'tip-of-the-tongue' phenomenon," *Journal of Verbal Learning and Verbal Behavior*, 1966, 5, 325–337.

Budzynski, T. H. and Stoyva, J. M., "An instrument for producing deep muscle relaxation by means of analog information feedback," *Journal of Applied Behavior Analysis*, 1969, 2, 231–237.

Dean, E. D., "The plethysmograph as an indicator of ESP," *Journal of the American Society for Psychical Research*, 1962, 41, 351–353.

Deikman, A., "Bimodal consciousness," *Archives of General Psychiatry*, 1971, 25, 481–489.

Dimond, S. and Beaumont, J., *Hemisphere Function in the Human Brain*, London, Halstead Press, 1974.

Ehrenwald, J., "Psi phenomena and the existential shift," *Journal of the American Society for Psychical Research*, 1971, 65, 162–172.

Freud, S., "Three essays on sexuality," in J. Strachey (Ed.), *The Standard Edition of the Complete Psychological Works*, Vol. 7, London, Hogarth Press, 1953 (First German edition, 1905).

Gerber, R. and Schmiedler, G., "An investigation of relaxation and of acceptance of the experimental situation as related to ESP scores in maternity patients," *Journal of Parapsychology*, 1957, 21, 47–57.

Green, E. E., Walters, E. D., Green, A. M. and Murphy, G., "Feedback technique for deep relaxation," *Psychophysiology*, 1969, 6, 371–377.

Honorton, C., "Objective determination of information rate in psi tasks with pictorial stimuli," *Journal of the American Society for Psychical Research*, 1975, 69, 353–359.

Honorton, C., "Psi and internal attention states," in B. Wolman (Ed.) *The Handbook of Parapsychology*, New York, Van Nostrand-Reinhold, 1977.

Honorton, C. and Harper, S., "Psi-mediated imagery and ideation in an experimental procedure for regulating perceptual input," *Journal of the American Society for Psychical Research*, 1974, 68, 156–168.

Honorton, C., Tierney, L. and Torres, D., "The role of mental imagery in psi-mediation," *Journal of the American Society for Psychical Research*, 1974, 68, 385–394.

Hull, C. L., *Principles of Behavior*, New York, Appleton-Century-Crofts, 1943.

Hull, C. L., *A Behavior System*, New Haven, Yale University Press, 1952.

Jacobson, E., *Progressive Relaxation*, Chicago, University of Chicago Press, 1938.

Johnson, M., "A new technique of testing ESP in a real-life, high motivational context," *Journal of Parapsychology,* 1973, 37, 210–217.

Kennedy, J. E. and Taddonio, J. L., "Experimenter effects in parapsychological research," *Journal of Parapsychology,* 1976, 40, 1–33.

Leshan, L., *The Medium, the Mystic, and the Physicist,* New York, Viking, 1974.

Luthe, W., "Autogenic training: Method, research and application in medicine," in C. Tart (Ed.) *Altered States of Consciousness,* New York, Wiley, 1969.

Maher, M. and Schmeidler, G., "Laterality effects in ESP processing," Paper presented at the 1976 Parapsychological Association Convention, Utrecht, The Netherlands.

Otani, S., "Relations of mental set and change of skin resistance to ESP score," *Journal of Parapsychology,* 1955, 19, 164–170.

Palmer, J., "1975 Parapsychological Association Convention." *Parapsychology Review,* 1976, 7 (1) 18–24.

Prabhavananda, S. and Isherwood, C., *How to Know God: The Yoga Aphorisms of Patanjali,* New York, New American Library, 1953.

Rogo, D. S., "Research on psi-conducive states: Some complicating factors," *Journal of Parapsychology,* 1976, 40, 34–45.

Roll, W. G. "ESP and memory," *International Journal of Neuropsychiatry,* 1966, 2, 505–521.

Smith, R., Tremmel, L. and Honorton, C., "A comparison of psi and weak sensory influences on ganzfeld mentation," *Research in Parapsychology 1975,* Metuchen, N.J., Scarecrow Press, 1976.

Stanford, R. G., "An experimentally testable model for spontaneous psi events: I. Extrasensory events," *Journal of the American Society for Psychical Research,* 1974a, 68, 34–57.

Stanford, R. G. "An experimentally testable model for spontaneous psi events: II. Psychokinetic events," *Journal of the American Society for Psychical Research,* 1974b, 68, 321–356.

Stanford, R. G., "Are parapsychologists paradigmless in psiland?" Paper presented at the 25th International Conference of the Parapsychology Foundation, Copenhagen, 1976.

Stanford, R. G., "Experimental psychokinesis: A review from diverse perspectives," in B. Wolman (Ed.), *The Handbook of Parapsychology.* New York: Van Nostrand-Reinhold, 1977.

Stanford, R. and Mayer, B., "Relaxation as a psi-conducive state: A replication and exploration of parameters," *Journal of the American Society for Psychical Research,* 1974, 68, 182–191.

Stevenson, I., "Telepathic impressions: A review and report of thirty-five new cases," *Proceedings of the American Society for Psychical Research,* 1970, 29, 1–198.

Targ, R. and Puthoff, H., "Information transmission under conditions of sensory shielding," *Nature,* 1974, 252, 602–607.

Tart, C. T., "Physiological correlates of psi cognition," *International Journal of Parapsychology,* 1963, 5, 375–386.

Tart, C. T., "States of consciousness and state-specific sciences," *Science,* 1972, 176, 1203–1210.

Tart, C. T., *The Application of Learning Theory to ESP Performance,* New York, Parapsychology Foundation, 1975.

Tyrrell, C. N. M., "The 'modus operandi' of paranormal cognition," *Proceedings of the Society for Psychical Research,* 1946, 48, 65–120.

Ullman, M. and Krippner, S., *Dream Studies and Telepathy: An Experimental Approach,* New York, Parapsychology Foundation, 1970.

Wallace, R. K., "Physiological effects of transcendental meditation," *Science,* 1970, 167, 1751–1754.

White, R. A., "A comparison of old and new methods of response to targets in ESP experiments," *Journal of the American Society for Psychical Research,* 1964, 58, 21–56.

White, R., "The influence of persons other than the experimenter on the subject's scores in psi experiments," *Journal of the American Society for Psychical Research,* 1976, 70, 133–166.

DISCUSSION

LESHAN: This is a tremendously impressive program of work and I'd like your reaction to a particular question about it. In your analogy of psi as an information processing system, have there been any experiments designed to evaluate what kind of information it's designed for? For example, is it possible that psi might better be viewed as a sensory processing system to communicate mood and emotion rather than specific information? To use an analogy, more like listening to the Triple Concerto rather than directions on how to change spark plugs.

BRAUD: It's a very interesting question and I've thought about that a lot. We are visual organisms and just as in sensory psychology and sensory physiology, we focus almost exclusively on the visual system because that is our major sensory modality. So too, in psi research, we focus not only on sensory information, perceptual information as is conveyed by the term "extrasensory perception," but almost exclusively on visual target information. Almost all of the work I've done has involved visual targets. I have done some work with auditory targets, musical selections. Other investigators are doing work now with tactile targets in an attempt to move away from exclusively visual processing toward other senses. There's an interesting rationale there, too, if this model is correct, if we're dealing with interfering noise. Since we deal so much with vision, we'd expect that to be the noisiest sensory channel, and it's interesting that we've chosen the noisiest sensory channel with which to do most of our research. Perhaps that could account for some of the lack of dramatic findings. As we move away to channels such as tactile, olfactory, maybe gustatory channels we might observe better results since there may be less noise. As I have mentioned in the first four pages of the paper in a cautionary note, we might be missing a good deal of the "action" of psi because we're looking at it almost exclusively in terms of *sensory* processing. It seems to me that we're attempting to learn about psi by studying sensory systems; its analogous to attempting to learn about one sensory system by studying another one—trying to find out about vision by studying audition. There's some overlap between the two. But in order to fully understand vision, at some point we're going to have to see and it's to no avail to restrict ourselves to another sensory system. I think we're doing something very similar in psi research. By restricting ourselves to sensory processing, we might be missing a great deal because I don't believe psi processing and sensory processing are that redundant. What is the use of psi if it only does what the senses do? I realize that, at

present, we can only verify psi by studying its overlap with sensory processing, so we focus attention there. But certainly I would welcome explorations into non-sensory processes such as moods, and perhaps some things we can't even talk about very well yet—the kinds of things that might go on in non-ordinary realities and non-ordinary consciousness.

HONORTON: I have two brief comments. First of all, your point concerning excessive autonomic activity. We have some very tentative support for this in an ongoing study in which we're monitoring EEG, EMG and hand temperature. Looking at physiological lability, the standard deviation of the physiological measures taken over three separate sampling periods divided by the means, we do have a significant difference favoring those sessions in which the subjects show less physiological variability. And I think that this is going to be something that will be increasingly important to look at in relation to the noise reduction concept. My other comment has to do with your discussion of various alternatives to noise reduction and I would rather think of these as complementary. It would be foolhardy to think that noise reduction is the whole story. It certainly is not; ritual must play an important part in these procedures. Given our cultural predispositions concerning psi phenomena, we cannot bring people in off the street and ask them to do things that they have learned from infancy are impossible to do, without giving a placebo or going through some type of rather esoteric procedure which will enable them to feel that conditions are being established which will increase the likelihood of success. While I agree completely that we need to move more in the direction of analytic studies looking at the specific contributions of these various factors, we are likely to find that it is a little of each.

BRAUD: That's an excellent comment, and of course, I can't argue with that. We may, in fact, find that these are all complementary influences—that they all have inputs into what we're doing. I mentioned them because to me we're faced with what seems to be a dilemma. On the one hand, we have what appears to be a field effect in psi experiments, in that all of the various factors seem to be playing a role and we're not necessarily talking about a particular person, a particular focus or locus of psi. In fact, we may never be able to isolate or localize psi in one person at a given time. But how do we reconcile that holistic field view of a psi event happening in the context of a laboratory participant's induction procedures with an analytical approach that we like to think we prefer as scientists? And what kinds of strategies do we use to attack that problem? What seems to me very

interesting is that these procedures seem to work, especially in the hands of certain investigators, and they're being promoted as psi-conducive procedures. But when one attempts to replicate them, just what do we replicate? Do we replicate the procedure itself? Do we try to replicate the laboratory and subtle interactions there? Do we replicate the investigator? I suspect if we can focus in on a weighting of these factors, we might stand a better chance of replicating some of these findings.

SERVADIO: There has been a mention in your presentation of personality characteristics, but it is not clear to me whether and how you took these characteristics into account. Were your subjects somehow tested psychologically before the experiments? I mean, what kind of persons were they? Because we have known for quite a long time that there are people who show, so to speak, psi proneness, and there are people who have personality characteristics that seem to exhibit particular resistance to psi. Therefore, it seems to me that accurate selection of subjects according to personality characteristics would also help in the noise reduction that you have described so well.

BRAUD: Yes. I would myself, in this context, consider personality differences in terms of the various kinds of profiles of noise present in different people. Just as Lacey, for example, talks about "autonomic profiles," people who are more or less active in various physiological channels, which seem to be rather different across people but rather consistent within a person across a period of time, perhaps there are similar profiles involving noise, and if we could assess noise level in various channels, then we could develop procedures that are tailored to those people and perhaps obtain better results. As to personality factors, we have not done any kind of sophisticated assessment of the kinds of subjects we're working with. I guess the reason for that is a feeling that the process that we're talking about is a very general one and we're interested in what we can learn about the process at large and not how it appears in a particular sub-class of people. So we've almost deliberately been testing self-selected volunteers—anyone who is interested in the experiment who would like to participate, without having to satisfy any kinds of personality criteria. The one exception to that is in the Transcendental Meditation study I mentioned, in which we compared people who had been meditating for five years, let's say, with people who had not been meditating. Now what kinds of non-meditators should we choose? Well, the very fact that a person becomes a meditator presupposes a particular personality structure. What we have done to deal with this problem was to at least attempt to

select people from the same general pool—the people who go into Transcendental Meditation are those who go to the introductory lectures and then go on into the course. So what we've done is take a sample from people who were in attendance at the introductory lectures, but who had not yet gone on into the course. The assumption is that similar interest patterns and similar personality patterns will have brought them to that initial step. That is a very important point, and that's one that would be subsumed under the experimenter effect and the alternative interpretations that I mentioned toward the end of the paper. We do have to deal with the nature of the subjects who participate in our experiments. This is especially a problem for those researchers who deal with the same small number of subjects over and over again.

SARGENT: I am interested to hear that you use the same people quite often, because I do have a little data, which is as yet unpublished, to show that experienced subjects exhibit different causative relationships between psychological variables and psi test performance from naive ones, so I think if we're considering replicability, it is very important to take experience into consideration. But my main point is that in a couple of papers cited we have the classic situation, Group A superior to Group B on a psi test, where that simple, bold conclusion may be misleading. One example of this is, I believe, the Braud, Smith, Andrew and Willis paper, certainly one of the papers on hemisphere differences. What we have is a superior performance by the right hemisphere over the left hemisphere group or, rather, superiority of the Mode I over the Mode II group, if you prefer that terminology. When we look at the detailed findings, we see that the right hemisphere groups score exactly at chance, whereas the left hemisphere groups show complete psi missing. It seems to be highly contestable that this provides any support for the idea that the right hemisphere or Mode I functioning is superior, because clearly it seems to me the left hemisphere group is showing highly superior detection of psi signals albeit reflected in psi missing. Professor Tart has also reported some psi missing effects in the ganzfeld. There are two further examples of this type of result in the Braud and Hartgrove paper. One of them is from the clairvoyance task, where, indeed, meditators are superior to nonmeditators, but if you look at the means, you'll find that the nonmeditators showed psi missing with the magnitude approximately twice as large as the psi hitting shown by the meditators. Also there is overall PK missing in a PK task, and there is a correlation of plus point five between PK score and meditation; what that means is that the magnitude of the PK effect is inversely proportional to meditational experience. Now it seems to me that paper and the other ones to which

I made reference, gave very poor support to the idea that these procedures facilitate the detection of psi signals. What it seems to me that you've got here is chance or near chance performance from your meditational group with fairly strong psi missing from the other group, and the difference is certainly significant and the meditators are certainly scoring better, but that in itself may be a rather misleading conclusion in terms of psi detection.

BRAUD: Your comments contain a number of errors of fact which should be corrected. First of all, in the Braud, Smith, Andrew and Willis study you mention, it is not the case that the Mode I ("right hemispheric") group scored at chance and that the Mode II ("left hemispheric") group showed "complete psi missing." If we look at the combined results of all three experiments reported in that series, what we actually find is significant hitting for Mode I subjects and chance performance for Mode II subjects. Next, in the Braud and Hartgrove study, the +.51 correlation you mention was between meditational experience and clairvoyance score, not between meditational experience and PK performance. In fact, a high clairvoyance score (psi hitting) was associated with greater meditational experience—a finding which is quite in line with predictions made from the model I've presented. Lastly, I refer you in this context, to a recent paper by John Palmer in which he discusses the problem you raise: how does one define psi? Do you define it as departure from mean chance expectation—in which case you have to consider directional deviations—or do you consider it in terms of absolute score? In our experiments we've operated under the implicit assumption that when we're talking about psi, we're talking about the accurate representation of the information. So it would seem to us that a high positive deviation or high hitting would be more illustrative of psi than would psi missing, because psi missing, in a sense, does involve distortions and we're talking about accurate representations. We've assumed that really we're using a zero baseline and that deviations from that zero are indications of psi. If you use another working model, then the kinds of points that you've raised are quite valid.

SARGENT: You do slip in the term "high positive deviation," and that's exactly what you haven't got. It's just telling a little bit about chance. If you're going for Palmer's Model I—I was indeed, of course, thinking of Palmer's paper—then, in fact, your findings are quite correct. But I do know that I would much rather have strong psi missing than chance scoring in my experiments.

BRAUD: The psi hitting in the Braud, Smith, Andrew and Willis study was quite strong. I prefer hitting to missing in my own studies.

TART: I was very interested in your feedback results, when you mentioned that the highly activated group did not seem to show an effect, while the low activated group did. I'm just reminded of classical psychophysiological effects. If you have people who are highly activated in any autonomic system, they are, in a sense, feeding on their own activity; they're excited about being excited, which makes them less responsive to outside stimulation. When you talk about your high group being relatively impervious, were they actually that highly activated, such that they would essentially be running on their own internal activity?

BRAUD: That's a good point, because I should have mentioned that what we have here is a relatively high group and a relatively low group, but all of these people in the context of this experiment had undergone a relaxation procedure, and the entire atmosphere of the experiment was conducive to relaxation, so we're talking about a group that is not very active to begin with but is made even less active. We're talking about people who are *very, very* quiet versus those who are simply *very* quiet. Also, the effect was greater for the former group, but it did occur also in the latter.

TART: So judging by the autonomic measures you would say they're all in a range where they would be relatively responsive.

BRAUD: That's right.

STRAUCH: I was very interested in your analysis of noise factors, and I would only like to comment on a parallel problem which came into my mind. With regard to dream recall there was a time when people could say, "I never dream," before it was detected that you only have to wake them up during a certain state of sleep. All the factors you mentioned as noise factors are also applicable to dream recall. You have the relaxed state where you are not to be bombarded with sensory stimuli in order to recall dreams. I wonder about your hypothesis that psi is functioning all the time and that we may only be confronted with a retrieval problem.

BRAUD: Exactly. This is our assumption, that these psi processes are active all the time, but we are more or less attentive to them, more or less aware of them. In the early stages of psychical research, there was a lot of emphasis on conscious psi experiences, because this was the only way that investigators had then of verifying these experiences. How can I detect psi unless you have a psi experience and can report it to me in words and allow me to verify it? So conscious reportable experiments became very high priority. But now we have other techniques. We can

look at physiological activity and we can look at what Stanford has been calling "non-intentional psi," "psi-mediated instrumental response," in which verbal reports are no longer necessary for the detection and confirmation of psi. So what you suggest regarding retrieval is a very good idea if we're talking about a particular kind of psi, the kind that can be communicated. But I'm very interested in the other types which don't reach this criteria and how the very same factors I mentioned in my discussion of the noise-reduction model influence them. You raised another interesting point, that the very factors that seem to be psi-conducive are also conducive to a number of other processes, and I'm especially interested in that. How do these factors affect memory, creativity, general psychological well being, general physical well being?

HONORTON: Going back to the discussion of personality factors, I would suggest that you add personality as another noise source here. If the process that we're dealing with beneath the level of communication is in reality a trans-personal process, as Gardner Murphy said many years ago, we're dealing with the interplay between people, or between the person and his environment, rather than something that is going on specifically within an individual. Then it may very well be that one of the things these procedures are doing is getting beyond that. And one very interesting study that is suggestive of this has been reported recently by Michael York in Morris' laboratory at the University of California in Santa Barbara. This was a ganzfeld study in which they obtained overall significant psi results and in which they used Croft's Defense Mechanism Test as a basis of predicting high and low defensiveness. As you probably know, Kanthamani and Johnson some years ago found some significant differences in a card guessing task without any kind of internal state procedure separating psi hitters and psi missers. The point in this context, however, is that York and Morris did not find any significant relationship between defensiveness and psi performance in the ganzfeld. I have to admit that I am personally very skeptical of a lot of the personality work in general because personality correlates don't seem to correlate very well with anything. But it may very well be that internal state procedures, if they are effective, go beyond that surface level of personality and that may be one of the factors that's operating and determining whether they're psi conducive or not.

BRAUD: What I hear you saying is that perhaps these techniques are effective to the extent that they eliminate personality; that we're talking about individual self getting in the way of the mind-at-large process that you'll talk about later.