

AN EXTENSION TO THE CNV STUDY AND AN EVALUATION

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The author has recently reported an experiment in which an electrical brain wave called the contingent negative variation (CNV) was examined for evidence of paranormally derived information about a future event (Hartwell, 1978). No significant results were obtained in that study which derived its subjects mainly from laboratory personnel and from the family and friends of the experimenters.

In the present experiment a very similar procedure was used with some subjects recruited according to the degree of perceptual defensiveness they showed on a previous Defense Mechanism Test. This test has been used as a predictor of performance on an ESP test in several previous investigations (for a summary see Johnson, 1977). In addition to these subjects, two others were selected because of their interest and their previous histories of spontaneous psychic experiences. One of these had been a subject in the earlier CNV experiment, providing results that supported the hypothesis. These latter two subjects were acquainted with the nature and purpose of the experiment. The subjects recruited from those taking the Defense Mechanism Test were not told about the parapsychological hypothesis being tested. They were told only that they have been selected because of their performance on the earlier subliminal test and that the warning stimuli used here provided varying levels of information, some of them being very difficult to see.

METHOD AND PROCEDURE

The experimental procedure employed was like that reported for the earlier study. Stylized faces served as warning stimuli and pictures of men and women as imperative stimuli in a CNV paradigm. The pictures were projected transparencies shown tachistoscopically. Subjects were asked to respond with a rapid button press to pictures of persons opposite their own sex. The warning faces sometimes

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provided information about the imperative stimulus to follow, A smile was followed by a person opposite the subject's sex, and a frown by someone of his own sex. Some of the smiles and frowns were easy to see (high contrast slides) and some were difficult (low contrast). Some of the faces were of low contrast and showed no mouths. These could be followed by either type of imperative stimulus as determined by a Schmidt-type random number generator. The trials using these warnings constituted the parapsychological portion of the test.

The experimental apparatus was also similar to that employed in the earlier study although several improvements were made in the stimulus delivery system. A random access projector was employed which permitted the order of the trials to be determined anew for each run. A shuffling procedure was devised which constrained each sequence to be balanced in its first order dependencies. That is, in each sequence of 36, each type of trial was followed exactly once by each of the six kinds (three levels of warning information X two sexes for imperative stimuli.) Within this constraint the sequences were random. A reduced level of illumination was used for both the slide projector and the back light so that the screen was easier for the subjects to look at. A smaller and brighter eye fixation lamp was employed in the hope of reducing systematic eye movements.

The analysis procedures were also the same as those used in the previous experiment except that the CNV waveforms were represented with fewer Fourier coefficients. The multivariate tests for significant differences on the informed conditions were carried out with only three variables (the dc term and one phase from each of the lowest two frequencies). When significant differences were found, a discriminant function was formed and used to classify the ESP trials. Five Fourier coefficients were used in these discriminant functions so as to include a generally small contribution from the influence of the evoked response on both phases of the third Fourier harmonic.

The main hypothesis did not differ from that of the previous study. Classifications for the ESP trials were carried out for all electrodes where reliable discriminant functions could be fashioned from the informed trials. The resulting t-values were tested for a mean of zero across subjects, separate tests being done for each electrode position (F_z , C_z , and P_z). Two additional hypotheses were derived from post-hoc analyses of the previous study. First, it was expected that the person who had scored well before would do so again. Second it was predicted that the random generator would more often select same-sex than opposite-sex stimuli, especially on the first run for each subject.

RESULTS

Only one of the hypotheses was properly tested. None were upheld. Useful data were obtained from only five subjects whereas ten had been planned. The others were lost to a variety of annoyances summarized below.

A test of the main hypothesis based upon those numbers in hand does not show significant deviations from chance. Table 1 presents those numbers in the format employed in the earlier CNV study. The frontal and central electrodes are included in data from three subjects, while information about the parietal site is available for only two people.

TABLE 1

Subject	F _z	C _z	P _z
MS	nc	1.477 ^F	nc
AN	-1.470 ^F	0.627 ^{F+L}	-1.487 ^{F+L}
PI	-0.137 ^{F+L}	nc	nc
EL	nc	-0.532 ^L	-1.296 ^L
DE	-0.985 ^L	nc	nc
mean	-0.864	+0.524	-1.391

TABLE 1. Classification of ESP trials by discriminant functions. Upper litterals denote the source of the discriminant functions (F for full information trials and L for low information trials). No classification (nc) was done when significant differences were not seen in the informed conditions.

It is difficult to answer meaningful questions with a sample of this size. Six of the eight entries in the table are opposite in sign from that expected. None exceed one and one half (theoretical) standard deviations from the expected mean of zero. An amalgamation of these data with those from the first study would also apparently lead to results reasonably attributable to chance. Certainly they do not strengthen the previous results.

The person who scored most strongly in the first experiment contributed the entry in the table corresponding to subject MS

(a centrally placed electrode). This is again the result most in accord with the hypothesis, but it does not represent a significant deviation from chance even with a one-tailed test.

Neither was a significant effect seen in the random generator's selection of imperative stimuli on the ESP trials. The overall totals were even (102-120), and the data from each subject's first run were 33 same sex and 27 opposite sex pictures.

DISCUSSION

This experiment and the very similar one which preceded it were developed to help assess the merits of one way of conceptualizing the operation of psi. The main hypothesis derives from the notion that psi is common in human endeavor and often serves an adaptive function. It is, however, thought to be a small effect, lying below the threshold of conscious awareness, and ordinarily quite hidden by a jumble of other and larger forces. There are many variations of this view, but perhaps the most fully developed has been published by Stanford (1974a, 1974b, 1977).

Little elaboration of the basic concepts is necessary to recommend some lines of experimental investigation. Stanford's own studies of unconscious psi tasks (Stanford and Thompson, 1974 and 1976) can be construed as evidence in favor of this general position. Although subjects in these experiments were without conscious knowledge that a certain random process would effect their futures or other people's futures, they were more often than not beneficially treated by the electronic dice. The scoring rates are low; the effect is a small one. But it is not significantly smaller than that seen in a host of other forced choice laboratory experiments in psi which involve or even emphasize conscious involvement with the task.

Thus one is invited to conclude that conscious engagement is not a fundamental requisite for the occurrence of the phenomena. Indeed, depending upon the state of consciousness, it may be more of an impediment than a help. The central conclusion of the depth psychologies is that certain kinds of information must surmount formidable barriers in order to gain conscious apprehension. This recommends experiments with persons in those altered states of consciousness reputed to improve the accessibility of other forms of information. The studies with ganzfeld, hypnosis, meditation and dreams summarized by Honorton (1977) and Van de Castle (1977) serve to bolster this argument. The research indicates that subjects perform better when they inhibit competing sensory information structures and attune themselves to a small effect that may be

always or often present but is ordinarily inaccessible.

At some level it is surmized, a correlation exists between events in the subject and those in the laboratory random device. The size of this correlation and the structures in which it should appear are not specified by this line of reasoning. It is implicit, however that to be advantageous the information must be present in biologically significant but unconscious forms.

The CNV studies were undertaken in order to examine a particular brain wave for evidence of this effect. This brain wave was chosen because it seemed, a priori, a likely candidate for revealing information of this kind. The CNV may be understood as reflecting the person's readiness to respond. This waveform is known to be influenced by psychological factors (Tecce, 1972). It was thought that the CNV might also reveal unconscious information in a setting which strongly encouraged an appropriate preparation to respond.

In fact the experiments did not resolve a significant difference of the type hypothesized. It may be, of course, that a small psi effect is present in the data but is undetected by the procedures employed. It may also be that the CNV poorly reflects unconscious processes and mostly represents the outcome of conscious deliberations. In that case there is the possibility that a more sensitive indicator will ultimately be discovered.

For now, however, the main effect of the experiments must be to detract from the appeal of the conceptualization of psi as abundant but unconscious. Certainly the experiments serve to lower the chance that a large neural effect will be found lying below conscious awareness but capable of influencing normal human behavior. This idea must now be judged weak in the same way that most other ideas about the operation of psi have been found wanting. It has so far failed to suggest an experimental arrangement in which the phenomena can be clearly seen and reliably studied.

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REFERENCES

- Hartwell, J. "Contingent Negative Variation as an Index of Precognitive Information"
European J. Parapsychology, 2, 2, 1978.
- Honorton, C. "Psi and Internal Attention States"
Handbook of Parapsychology,
Van Nostrand Reinhold Co., New York, 1977.
- Johnson, M.
Lubke, C,, "A further attempt to validate the DMT as a predictor of scoring direction"
European J. Parapsychology, 1, 4, 1977.
- Stanford, R. "An experimentally testable model for spontaneous psi events. I. Extra sensory events."
J. Am Soc Psychical Res, 68, 34-57, 1974a.
- Stanford, R. "An experimentally testable model for spontaneous psi events. II. Psychokinetic events."
J. Am Soc Psychical Res, 68, 321-356, 1974b.
- Stanford, R. "Experimental psychokinesis: a review from diverse perspectives"
Handbook of Parapsychology,
Van Nostrand Reinhold Co., New York, 1977.
- Stanford, R
Thompson, G. "Unconscious psi-mediated Instrumental Response and mediated instrumental response"
J. Am Soc Psychical Res, 70, 167-178, 1976.
- Stanford, R.
Thompson, G. "Unconscious psi-mediated response and its relation to conscious ESP performance",
In Roll, et al(Eds.).
Research in Parapsychology, 1973, pp. 99-103,
Scarecrow Press, Metuchen, N.J., 1974.
- Tecce, J. "Contingent negative variation (CNV) and psychological processes in man"
Psychological Bul., 1972, 77, pp. 73-108.
- Van de Castle, R. "Sleep and Dreams"
Handbook of Parapsychology,
Van Nostrand Reinhold Co., New York, 1977.

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