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- 65 POSSIBLE PRECOGNITION OF THE TETON DAM DISASTER IN IDAHO. *Lucille Wood-Trost*
- 75 PARANORMAL ELECTRICAL EFFECTS. *J. B. Hasted, D. Robertson*
- 87 THE EFFECT ON THE SUBJECT (IN WAKING, SWS AND REM STATES) OF ELECTRICAL SHOCKS TO THE AGENT. *K. M. T. Hearne*
- 93 BOOK REVIEWS. *J. F. McHarg, Psychic-nexus: Psychic Phenomena in Psychiatry and Everyday Life. A. Gould, The Story of Ruth. J. L. Randall, Communication and Parapsychology. D. Christie-Murray, Exploring Parapsychology: A New Collection from the ASPR Newsletter. R. Thornless, Cases of the Reincarnation Type Volume III. Twelve Cases in Lebanon and Turkey. M. Percy, Reincarnation—Ancient Beliefs and Modern Evidence. A. E. Roy, British History According to the Oracles of Nostradamus 1549–1945. The Future According to the Oracles of Nostradamus 1981–1999. M. Horder, In Her Own Write: Rosemary Brown. M. Goss, A Geo-Bibliography of Anomalies. L. Price, The Dark Gods. L. Price, Register of the Thomas Glendenning Hamilton Collection. B. Inglis, The Psychology of Transcendence. M. Perry, Strange to Relate. D. Ellis, The Open Door*
- 111 CORRESPONDENCE
- 130 NOTES AND NOTICES

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THE EFFECT ON THE SUBJECT (IN WAKING, SWS AND REM STATES) OF ELECTRIC SHOCKS TO THE AGENT: AN 'ESP' EXPERIMENT

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ABSTRACT

Eight Subject-Agent (S-A) pairs, each emotionally close, were used in an 'ESP' experiment in which the awake A received 8 electric-shocks over a 16 minute period when the S was in each of the following distinct physiological states: awake, slow-wave sleep (SWS), rapid-eye-movement sleep (REM). Heart-rate was measured in the S at those times. Eight Control (C) trials, where the shock was diverted to a resistor, were randomly interspersed with the Experimental (E) trials. There was no significant difference between E and C trials overall in any of the 3 conditions. One S-A pair appeared to show an 'ESP' effect, however 2 re-runs failed to reproduce it, so the statistical significance was taken to be spurious.

INTRODUCTION

Throughout history there have been reports of cases where a sudden crisis in one person has allegedly been synchronous with an appreciation of that fact by another at a distance, without sensory communication between the pair (e.g. Gurney et al., 1886). If such accounts are true, they may be explicable by pure coincidence, or perhaps more subtle psychological links such as unconscious awareness of a common anniversary causing a synchronous psychosomatic episode in both persons. The final consideration is that perhaps some 'extra-sensory' process is involved, but it is that which will be investigated in this study.

The alleged events appear to be rare though, and one possible viewpoint, based on the acceptance of 'psi' is that for some reason it is a declining ability in man. Evolutionarily, the conveyance of an 'extra-sensory' alarm signal at moments of crisis could benefit the survival of a species in that it could warn those emotionally close of danger so that they might escape or help the distressed one. Vestiges of the process might remain which could be revealed by the electrophysiological monitoring of persons to detect small unconscious emotional responses when another person experiences sudden crises.

The production of painful events in Subjects in the laboratory is not common in tests on humans for obvious ethical reasons, but this would seem to be an important avenue in which to seek 'functional ESP' if it exists. Card-guessing experiments, for instance, have been criticised for a lack of emotional association in the test material. Tart (1963) claimed that Ss responded physiologically (on a few of several measures) when the Agent (Tart) was stimulated by electric shocks. The responses were significantly greater on E trials, whereas conscious guesses showed no deviation from chance. However, Tart urged caution in accepting his results since they did not provide firm evidence of 'psi cognition'. He also considered that emotionally-close persons might show a stronger effect.

It was decided to observe the physiological effect on the S when an emotionally-close A was administered electric-shocks, using several S-A pairs. Two other basic physiological states apart from wakefulness (i.e. Stage REM sleep and slow-wave sleep) would be similarly investigated to observe any differential effects. Stage REM sleep (associated with dreaming) has been thought by some workers to be particularly conducive to 'ESP' (Ullman et al., 1973). Personality and attitude-to-ESP information would also be acquired as useful data for possible future comparative studies.

The greatest consideration was given to the ethics of using electrical stimulation on Subjects. However, the form of stimulation was considered to be necessary in order to simulate (as close as possible in the laboratory) an 'emotional crisis', which anecdotal accounts have associated with 'psi' effects. The study was seen as an essential basic experiment in parapsychology. In fact, Subjects were not as worried about ethical matters as the Experimenter. The volunteers were quite willing to participate in order to assist the advance of scientific knowledge, for which they must be applauded.

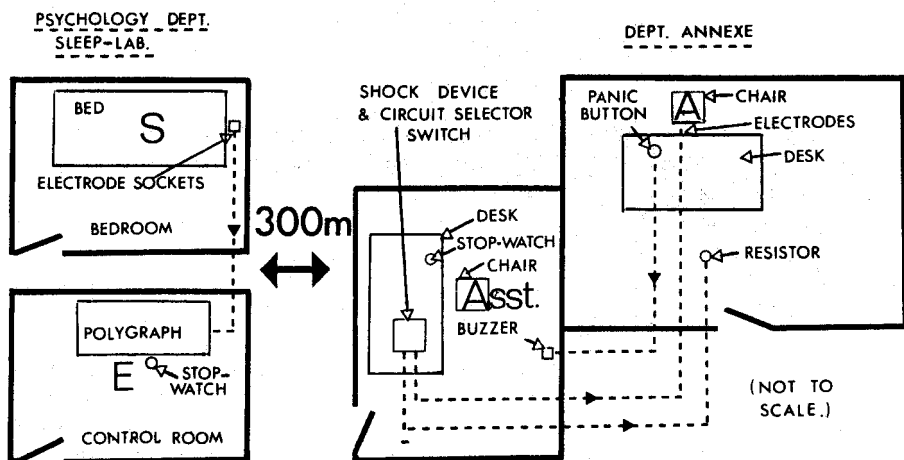


DIAGRAM SHOWING ARRANGEMENT OF EXPERIMENT.

METHOD

The unpaid volunteers for this experiment were all students, obtained by canvassing at their Halls of Residence. There were 5 male-female pairs (sweethearts or very good friends) and 3 female-female couples (very good friends). Ages ranged from 18 to 20 years. The full nature of the experiment was explained to Ss and As. All Ss were female.

The S was situated in the sleep-laboratory bedroom of the University's Psychology Department, with E (K.H.) monitoring the electrophysiological apparatus in a nearby room. The A and an assistant were in separate rooms in an annexe about 300 metres away. Some distance between S and A was essential in case possible vocalisations by the A (accompanying shocks) were perceived by

the S, so causing a false result. The assistant sat at a desk on which was placed a shock-unit consisting of a PP9 battery linked to a Radio Spares type 218-567 transformer (30-1), and a firing-button. Also incorporated was a 2-way switch that could route the electrical pulse to either the A or to a dummy load, placed near the A, of the same resistance as human skin. The purpose of the dummy load was to control for any electrical phenomena accompanying the shocks affecting the distant recording apparatus. The A sat at a desk in the room next to the assistant. Two electrodes were attached by micropore tape to a finger of the A's non-preferred hand. A 'panic button', to stop the experiment, was placed on the desk in front of the A.

The S was wired-up for electrophysiological monitoring. EEG was recorded from electrodes placed at approximately Pz and Fz positions according to the International 10-20 system (Jasper, 1958). EOG was derived from electrodes placed by the outer canthus of each eye. Submental EMG was also recorded. An electrode on the sternum, referred to a fore-head electrode, measured heart-rate. The recording machine was an Eléma-Schönander Mingograf.

Both S and A filled in a questionnaire and the Eysenck Personality Inventory (Eysenck & Eysenck, 1965). The A signed a form consenting to the receipt of electric-shocks and declaring a state of physical and psychological fitness.

The S was put to bed and given instructions but told to sit up and stay awake for the first test condition, after which the S was left undisturbed through the night.

Before each of the 3 conditions (awake, SWS, REM), the Experimenter phoned the assistant to synchronize stop-watches. The assistant then prepared a random sequence of 8 E and C trials (in 4 sets of 4 so as to avoid bunching) by shaking a container of 4 counters (2 E and 2 C) and then selecting. E or C circuits were switched by the assistant before each trial according to the random sequence. The assistant pressed the shock button, and the Experimenter marked the chart paper, at precisely 1 minute intervals starting at the 5th minute after synchronization of watches. The Experimenter and S were unaware of the sequence of random E and C trials.

The SWS trials occurred in the first non-REM period of the night within one hour of sleep onset. Stage REM trials occurred after a minimum of 6 hours sleep in the S, in a long later REM period. In all 3 conditions the A was awake when receiving shocks.

RESULTS

For all Ss the physiological state for each of the 3 test conditions was as planned (Awake; Stage 4 for SWS; Stage REM for REM). Occasionally, in the two sleep conditions, some Ss had a brief period in a nearby Stage. If a S shifted drastically from a sleep state the set of trials was re-run at the next opportunity that night. This was the case 5 times in all (one was where the REM condition had to be re-run on another night).

The expectation as to the experiment's outcome¹ was 'positive' or 'don't know' in the As, but all Ss selected the latter category. On the other hand, Ss tended to believe in 'ESP'² whereas As were undecided. Mean EPI scores³ were: (Introversion/extraversion) As: 17·87, Ss: 15·00; (Neuroticism) As: 13·25, Ss: 12·25.

The expectation of the E, As, Ss and assistant as to the outcome of this experiment, and their belief ratings in 'ESP' generally were: (Outcome scale: 1 = negative, 2 = negative, 3 = don't know. Belief in 'ESP' scale: 1 = strongly believe, 2 = moderate belief, 3 = tend to believe, 4 = undecided, 5 = tend not to believe, 6 = moderate disbelief, 7 = strongly disbelief).

1 Outcome

E: 2; Asst: 3; As: 1,3,1,3,3,1,3,3 Ss: 3,3,3,3,3,3,3,3

2 Belief in 'ESP'

E: 6; Asst: 2; As: 3,2,1,5,2,1,2,5 (mean: 4.2) Ss: 4,4,4,2,3,2,2,3 (mean: 3).

3 The EPI scores for the participants were as follows: (Introversion/extraversion)

E: 6; Asst: 14; As: 17,19,21,12,20,21,16,17 (mean: 17.87)

Ss: 15,18,16,15,7,16,15,18 (mean: 15)

(Neuroticism)

E: 5; Asst: 8; As: 13,17,18,12,18,8,13,7 (mean: 13.25)

Ss: 14,10,12,10,21,14,8,9 (mean: 12.25).

Not unexpectedly, both Ss and As were significantly more extraverted than the typical sample of Students shown in the EPI manual (Form A). (Ss: $t = 3.1$; 7 d.f.; $P < 0.05$; As $t = 6.3$; 7 d.f.; $P < 0.01$).

The order of individual Ss and As in these scores is the same as in the raw data table.

The assistant reported no vocalizations from As, so no known sensory cues were communicated to the Ss. Overall, As perceived the shocks as being moderate to severe in intensity. Mean ratings were: awake: 2.5; SWS: 2.3; REM: 2.6 (scale: 1 = slight; 2 = moderate; 3 = severe; 4 = very severe).

It was decided, before the experiment began, to measure heart-rate from a 30 second chart-epoch: 15 seconds before (to allow for any slight 'precognition'), to 15 seconds after the moment of stimulation of the A or dummy load. It was presumed that the 'time-constant' of any emotional response from the S Would be short enough to permit recovery to baseline for the next trial. Heart-rates for E and C trials were subjected to analysis of variance, for each of the 3 conditions.

There were no significant differences between E and C trial heart-rates in any of the 3 states: Awake: $F = 1.20$; 1,7 d.f.; n.s.; SWS: $F = 0.39$; 1,7 d.f.; n.s.; REM: $F = 0.00$; 1,7 d.f.; n.s. Post hoc inspection revealed that one S-A pair (no.6) did display a 'significant effect' in the Awake condition ($t = 2.40$; 14 d.f.; $P = 0.02$), however that result was out of 24 separate comparisons, so by itself no claims can be made. During the Awake condition, the S made a total of 8 slight physical movements (1-6 seconds duration), which caused trace-artefact on the chart. Three of these movements coincided with moments at which the A was receiving electric shocks. Another movement occurred a few seconds before one of these coinciding movements. Four other artefacts were monitored between the measured epochs.

It was decided, with their consent, to re-run this S-A pair to see whether the effect could be repeated. The method was altered slightly in that the S was given a push-button to press whenever she thought that her boyfriend was receiving a shock. On retest, no significant difference was found between E and C trials ($t = 0.14$; 14 d.f.; n.s.). The S pressed the button 15 times in all, but in both E and C epochs. However, on one occasion the S pressed it 3 times within 9 seconds and stated later that she was particularly sure that a shock had been administered to the A then, which was in fact the case. However, the chances of a 9 second period coinciding with a shock over the total test time, are approximately 1 in 12, which is not significant. A further re-run was later arranged, but on that occasion no evidence was discovered for 'ESP' either in heart-rate measures ($t = 0.63$; 14 d.f.; n.s.) or in a coinciding physical response.

S	AWAKE	MEANS	SWS	MEANS	REM	MEANS
1 ^E	42 40 41 46 47 46 43 46	43.87	32 32 32 32 30 31 31	31.50	34 35 39 31 27 36 32 32	33.25
1 ^C	40 39 49 41 45 45 45 41	43.12	32 32 32 31 32 31 31	31.50	33 33 34 33 32 33 33 31	32.75
2 ^E	36 33 33 33 32 34 33 33	33.37	31 31 32 36 31 32 34 34	32.62	33 32 31 30 30 28 29 30	30.37
2 ^C	34 32 32 32 34 33 34 34	33.12	30 30 31 40 31 32 33 34	32.62	30 29 29 30 29 30 27 32	29.50
3 ^E	32 34 34 34 37 32 32 32	33.37	31 32 32 31 32 32 32 32	31.75	29 28 31 31 30 31 27 30	29.62
3 ^C	31 31 33 35 34 33 32 33	32.75	31 32 32 32 32 32 31 33	31.87	30 29 29 29 31 30 37 31	30.75
4 ^E	28 29 28 29 27 27 28 29	28.12	28 30 28 29 29 30 30 30	29.25	33 36 32 33 33 35 31 31	33.00
4 ^C	28 28 31 30 28 29 27 31	29.00	29 29 30 27 28 28 30 28	28.62	33 33 45 29 36 33 34 35	34.75
5 ^E	37 37 35 38 39 38 38 40	37.75	38 39 38 39 39 39 40 39	38.87	39 41 41 40 37 36 39 37	38.75
5 ^C	40 37 36 38 40 40 38 37	38.25	38 39 39 38 39 40 38 40	38.87	39 39 42 40 38 37 38 41	39.25
6 ^E	31 32 32 35 33 34 36 34	33.37	26 27 27 26 27 26 27 26	26.50	31 31 29 31 32 31 32 35	31.50
6 ^C	31 32 32 31 30 34 31 32	31.62	26 27 25 26 27 27 33 26	27.12	31 31 31 29 30 32 31 32	30.87
7 ^E	40 39 40 39 37 39 40 38	39.00	30 29 29 30 28 28 29 29	29.00	32 30 33 31 27 30 29 32	30.50
7 ^C	37 38 40 39 41 38 37 38	38.50	29 29 29 31 29 29 29 29	29.25	29 28 33 31 28 30 28 28	29.37
8 ^E	22 22 21 23 22 22 21 22	21.87	22 19 20 20 21 20 21 21	20.50	25 24 30 25 27 24 24 24	25.37
8 ^C	22 21 23 22 22 21 22 22	21.87	22 25 19 19 20 21 20 20	20.75	25 25 26 28 26 24 22 24	25.00

Table of raw data. Heart-rates (b.p.m.) in E&C trials.

DISCUSSION

Overall, despite the fact that one partner received painful stimulation, no reflection of this was registered in the other, according to the physiological monitoring employed in this experiment. Yet here was a reasonable situation in which to expect to detect 'ESP' since there was a definite emotional element and the parties were psychologically set for its occurrence. Certainly, the perceived strength of stimulation in the As was high, demonstrating that the shocks were registered powerfully. However, overall, none of the 3 conditions provided evidence of a 'psi' effect.

It might be claimed that the couples in the study did not have enough rapport, as none were married and they had been together for a relatively short time. Conversely, the emotional bond was very strong in some cases, which might be expected to enhance any 'ESP' effect. Another consideration could be that the extreme nature of the experiment attracted a particular personality type that might happen to be unresponsive to 'ESP'. In this study though, most participants scored high on extraversion, which Eysenck (1967) postulated should be conducive to ESP (in that extraverts tend to have lower cortical arousal, which facilitates 'ESP').

Concerning the S-A pair who appeared to show an effect, the significance of the coincidences of physical movements with shocks (which presumably caused the increased heart-rate at those times) is difficult to assess. It was not replicable, and so scientific caution insists that the initial effect should be viewed as spurious.

In summary, the work provides no support for the notion or 'extra-sensory' communication between emotionally-close persons.

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The Assistant was Mr. A. Worsley.