

Unexpected Common Patterning of Subject Data. When all 10 subjects' (exploratory and replication) data were examined, 16 of 190 possible comparisons (8.4%) were significant at the .05 level, whereas 7/190 comparisons of simulation data were significant at the .05 level. A graphical analysis of the data revealed an unexpected common patterning in significantly intercorrelated subject data: The subjects' intercorrelated data form a pattern that can be roughly described as a "U" curve. No pattern is visible in intercorrelated simulation data.

Blind Matching. The experimenter's data yielded a rank of 1 and the second exploratory subject's data yielded a rank of 2. Among the eight replication subjects, 3 yielded ranks of 1 (exact binomial probability of 3 out of 8 with rank of 1 = .005, where  $p = .0476$ ,  $q = .9524$ , one-tailed).

#### Discussion

The first hypothesis, that subjects temporally pattern RNG data with which they interact, received weak confirmation. Two of eight participants showed significant correlation of the temporal patterning of significant run scores between two separate experimental replications, and a third subject showed a marginal correlation. Matched simulation data showed chance outcomes.

The second hypothesis, that such patterns would be idiosyncratic enough to allow blind matching by objective means was strongly supported. Three of eight subjects' data (38%) were correctly matched from within 20 decoy data sets.

What was most unexpected was the similarity of patterning among individuals. The pattern formed can be described as a "U" curve. As a group, the intercorrelated subject data showed a pattern of significant hitting near the beginning of the game, followed by significant missing in the game's middle, followed by recovery to chance at the game's end. Had a summary measure alone been used, it would be concluded that "no effect" was present in this analysis: Consistent, periodic hitting and missing cancel each other out. This conclusion, if based on individual data sets instead of an ex-post-facto grouping, would be the same: Half of the 20 data sets showed a periodic hitting/missing pattern, with the hitting at the beginning of the game and the missing in the game's middle, followed by a recovery to chance levels. Of the 12 simulation data sets that showed significant intercorrelations, no patterning can be seen.

Random fluctuations should statistically average out, and there should be no differences between temporal epochs (if there is no effect of the subject on the data). The present data indicate that, indeed, subjects do influence random data idiosyncratically, but the present subject population showed a strong common effect.

This pattern is one that has a long history in standard psychological tasks (e.g., the "U" curve associated with learning temporal sequences of items and attributed to the motivational effects of "primacy" and "recency"). Replication of the present work is in progress, and future work will explore other parameters of random data for evidence of idiosyncratic patterning.

#### AN EXPERIMENTAL EVALUATION OF A BELIEF IN PSI

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Belief in psi has been a topic of investigation over recent years, especially by skeptics of parapsychology. The results achieved, however, have been inconclusive, and many of the studies may have been biased. This study was therefore an attempt to investigate belief in psi taking account of these biases.

The subjects involved in this study were second-year psychology undergraduates at Edinburgh University, a class composed of 117 students (83 females and 34 males). They were all initially approached during their practical classes and asked to participate in the study, when they were told that the purpose of the study was to collect data to establish population norms for attitudes about unusual phenomena. Each subject was then handed a questionnaire which was set up along the following lines.

Section A: Subjects had to reply yes or no, depending on whether they had experienced any of the following: a dream that later came true; thought about someone just before they telephoned; successfully tried to score in a definite way in a card game; been consistently lucky; been consistently unlucky; known that a letter was about to arrive. If a "yes" answer was given to any of these experiences the subjects had to rate that experience on a five-point scale, 1 (definitely psychic) to 5 (definitely coincidence/normal explanation).

Section B: Subjects had to rate a list of phenomena, which fell into the following groups: "real"--ball lightning, acupuncture, dreams, meteorites, hypnosis; "psi"--ESP, psychic healing, telepathy, mind over matter, clairvoyance, poltergeists; "anomalous"--Bigfoot, Atlantis, UFOs, spontaneous combustion, Abominable Snowman, Loch Ness monster; "false"--alchemy, phrenology, flat earth, astrology. The phenomena were rated on a seven-point scale, 1 (not real) to 7 (real).

Section C: Subjects chose a passage which was either for or

against parapsychology, and said how much they agreed with it on a three-point scale, 1 (strong agreement) to 3 (mild agreement).

Section D: Subjects had to rate the importance of religion and science on a four-point scale, 1 (major influence) to 4 (no influence).

The subjects were asked to fill out the questionnaire and return it the following week. Those subjects who were participating in the Differential Psychology course (88 students) were approached a few weeks later and handed a questionnaire (Rotter's Locus of Control, labeled "I-E Scale"). At a later stage permission was granted for other personality data (from an Eysenck Personality Questionnaire, or EPQ test) to be made available to the author for the purpose of this study. Seventy-six subjects returned the original "Attitude Survey" questionnaire, 35 of whom also returned the Locus of Control scale. EPQ data were available for 37 subjects.

There are no sex differences in the number of experiences reported, although males had a lower (i.e., more psychic) mean evaluation for all experiences than females (2.7 to 3.7,  $p < 0.01$ ). There were no personality differences between subjects who rated the experiences as coincidental and subjects who rated the experiences as psychic, although subjects reporting fewer experiences were more neurotic than those who reported more experiences than average ( $p < 0.05$ ). Subjects who rated the phenomena highly (i.e., coincidence explanation) did not differ in personality from other subjects. Subjects who rated the experiences at the other extreme (i.e., psychic explanation) appear to be more introverted and neurotic than other subjects ( $0.1 > p > 0.05$ ). However, due to the small number and the level of significance the result should only be considered suggestive rather than conclusive. The mean scores for each of the groups of phenomena were as expected, i.e., real (5.91) > psi (4.41) > anomalous (3.51) > false (2.52).

Subjects who had a higher psi rating (i.e., rated psi as valid) were more inclined to believe in the validity of anomalous phenomena ( $p < 0.01$ ). These subjects also had higher ratings for the real group of phenomena ( $p < 0.0005$ ). Males were also more likely to rate the real and anomalous groups higher than did females ( $p < 0.05$ ). Subjects with a high psi rating reported more experiences than subjects with a low psi rating, although there were no significant differences in their evaluations of these experiences. There were no personality differences between these two groups, or groups with more extreme psi ratings.

Sixty-five subjects agreed with Passage A (positive to parapsychology) and 10 agreed with Passage B. Seventeen subjects expressed a strong agreement (16 for Passage A and 1 for Passage B). There were no personality differences between those subjects who chose Passage A and those who chose Passage B. Similarly,

there were no personality differences between those subjects who expressed strong agreement and those who didn't. Subjects who chose Passage A had a higher rating for the psi group ( $p < 0.0005$ ), the anomalous group ( $p < 0.001$ ), and also the real group ( $p < 0.05$ ).

The mean reported ratings were 2.4 (important/minor influence) for science and 3.0 (minor influence) for religion. Those subjects who reported science or religion as being very important in their lives did not differ in personality from those subjects who did not report such an importance. There were no differences in the passage chosen or the group ratings for those subjects who reported a strong importance for science or religion compared with the rest of the subjects.

From the first part of the study we can see that a belief in psi is not the result of a specific personality pattern or the consequence of some illogical cognitive process. The idea was therefore put forward that the previous studies were actually measuring factors relevant to strength rather than content of belief. Consequently, the second part of this study was an attempt to measure differences due to extreme attitudes. However, the results achieved were inconclusive with regard to this specific question, but this may have been because of the size of the study rather than for any other reason. It therefore seems that the idea that subjects displaying strong attitudes have a characteristic personality/cognitive profile is worthy of further investigation. Such a study would have to take into account the biases that could affect the results, while at the same time have a large enough number of subjects to be able to measure extremes. Since, in this case, the content of the belief may be largely irrelevant, it should be possible to test this notion using different contents. We would then be able to determine if the personality/cognitive results do actually relate to one's holding an extreme attitude or if they are dependent on the particular content of that attitude. Either way, the results would shed more light onto the debate about the validity of a belief in psi.

#### EXPERIMENTAL INVESTIGATION OF BIOLOGICALLY INDUCED MAGNETIC ANOMALIES\*

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While electrical phenomena in biological processes are relatively

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