

A POSSIBLE ARTIFACT IN A PK TEST FOR BABIES

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In a recent issue of the 'European Journal of Parapsychology' Dick Bierman (1985) reports two series of computer controlled experiments in which targets were generated by a Random Number Generator (RNG) and the subjects were babies. The main prediction was "There will be a differential effect between feedback and non-feedback trials" (Bierman, 1985, p.377).

In the first (Amsterdam) series, with two babies, overall results were close to chance and this prediction was not confirmed. A second series was run in Bristol, using the same software and using one baby as subject. The present authors were the experimenters. This confirmed the main hypothesis showing a significant feedback effect with significant hitting in the feedback condition.

In an experiment of this kind the conclusion that psi was responsible for the results depends crucially on the randomness of the RNG, especially since there was no control condition without a baby present. We were concerned about possible non-randomness and therefore set about testing the RNG using the actual computer and RNG electronics used in the original experiments.

Long series of randomness tests showed no overall first order

biases. However there appeared to be possible irregularities when the computer was 'cold' and we decided to investigate these further.

We thought it possible that temporary non-randomness may occur which is dependent upon the state of the computer at any given time. For example the output of the RNG might be influenced by the thermal state of the computer and by input/output activity occurring immediately prior to number generation. All these might be expected to vary the operating characteristics of the Zener diode used in the RNG circuit. The thermal state may affect breakdown voltage, input/output activity the supply voltage. In addition, there might be important interactions between these two parameters.

There are obviously differences in input/output activity between the feedback condition (in which a tune is played and a picture displayed) and the non-feedback condition in which there is no sound or display. If such effects were temperature dependent then they might be expected to be greater if the computer were run 'cold', that is having only recently turned on. It would then be in its least stable state. Many of the trials in the original series were run with the computer 'cold'.

To test this hypothesis we ran two more series of trials using the same system and procedure as before only with no baby present. To rule out any psi-mediated feedback effects by others all trials were run out of sight and ear-shot of anybody else. There were 30 trials run with the computer 'cold'; that is, it had just been turned on and had previously been off (but at normal room temperature) for at least 12 hours. There were 30 trials run with the computer 'hot'; that is, it had been on for more than 6 hours prior to the test.

We predicted that the positive results of the original experiment would be replicated in the 'cold' computer condition, but not necessarily in the 'hot' condition.

Biermans's software produces two scores for each trial with MCE=8 (feedback and non-feedback). For the 'hot' computer mean scores were 7.23 and 8.13. These are not significantly different from MCE and there is no significant difference between them.

For the 'cold' computer mean scores were 8.13 and 6.7. There is no significant hitting in the feedback condition but there is the expected differential effect, with the feedback score significantly

higher than the non-feedback score ( $t=2.21$ ,  $df=29$ ,  $p<.05$  two-tailed). Our prediction is confirmed: a 'Bierman effect' for the 'cold' computer but not for the 'hot' computer.

We infer that some kind of temperature-dependent artifact may be responsible for this differential effect. Of course it is possible to argue that some kind of psi-mediated experimenter effect of expectation was responsible, but this seems purely ad hoc and unhelpful since the state of the computer (hot or cold) appears to influence the outcome and this was not embodied in Bierman's original predictions nor any rational extension of them.

We make no specific suggestions as to the mechanism of this possible artifact beyond the original speculations which prompted us to run the experiment. We only wish to point out that these results suggest that in PK experiments with RNGs non-randomness (i.e. malfunction of the RNG) may appear in the actual running of a program while being undetectable in usual randomness tests run over a long period (e.g. all night). Also, if we have detected non-randomness in the behaviour of the RNG, it may well only be detectable in a short series, as in a real experiment, not in millions of randomness trials.

We conclude that tests for non-randomness may need to be specific to the situation (e.g. program and computer) in which the RNG is being used. Also if claims are to be made about the role of the subjects in PK experiments, control trials without subjects are essential.

#### REFERENCES

Bierman, D.J. 'A retro and direct PK test for babies with the manipulation of feedback: A first trial of independent replication using software exchange', E.J.P., 5, 1985, 373-390.

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