RESEARCH LETTER

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CONTENTS

Breederveld, H.	Towards reproducible experiments in psychokinesis	
	I: Experiments with dice	p. 1
	II: Experiments with a roulette apparatus	p. 6
Jacobs, J. Breederveld, H.	Possible influences of birth order on ESP ability	p.10
Ollmar, S. Petterson, L. Tengstrand, G.	Testing the Backster effect	p.21
Ollmar, S. Tengstrand, G.	PK on radioactive decay	p.23

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TOWARDS REPRODUCIBLE EXPERIMENTS IN PSYCHOKINESIS

I EXPERIMENTS WITH DICE

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The experiments reported below are a continuation of the work with dice that has been published at the Tenth Annual Convention of the Parapsychological Association and in the Tijdschrift voor Parapsychologie.

It seems that the goal of this research, started in 1964, the development of a method to obtain reproducible above chance results in psychokinetic experiments with dice, has been reached.

EXPERIMENTAL PART

42 series (experiments) have been carried out up till now by the method mentioned above, with the author as a subject, working alone. Total number of trials: 240,000 ; total number of hits: 40,409 ; MCE: 40,000; P = .01 (one-tailed).

As target, the 4-face was, somewhat arbitrary, chosen. It was thought that changing the target-faces was not favourable for high scoring. The 4-face was chosen while this face is associated with success in the earlier reported experiments. All but one of the series are made up of several runs. A run comprises several groups of 100 trials. The number of groups of 100 trials depends on the results of these groups: dice throwing is continued until a group with a number of hits above MCE (17 or more) appears and stopped after the first group with a number of hits below MCE (16 or less). In general only one run daily.

This stopping strategy seems to be an essential aspect of the method. It is based on the assumption that in parapsychological experiments decline and incline effects occur. In 40 of the 42 series the length of the series was planned beforehand. This implies that for the last run of a series the stopping strategy mentioned above could not be vigorously followed.

The number of 100 trials for the units in a run is arbitrarily chosen. The methods of statistical analysis were planned beforehand and comprised for each series: number of hits and corresponding values for P and (eventually) P-difference of series, first halves of the series, second halves of the series, combined first halves of the runs, combined second halves of the runs, combined first halves of groups of 100 trials, combined second halves of groups of 100 trials, combined left halves of groups of 100 trials, combined right halves of groups of 100 trials. In addition, for each series the frequencies of the numbers that were thrown were calculated.

All experiments were carried out with a high precision die (Mason Co., Chicago). The die was thrown by the hand with the aid of a cup.

Table I gives a survey of the 42 series with respect to conditions and number of hits. The Tables II and III show that for the total of 240,000 trials only the aspect "total number of hits" reaches statistical significance. There are no indications for a quarter distribution effect as observed by Rhine and Humphrey (1944).

The series 35,58 and 69 need still some comment. Series 35 was carried out with the subject under the influence of 600 mg meprobamate. In a similar experiment (series 12) it seemed that meprobamate favoured high scoring when the 4-face was the target (Breederveld 1967, 1969). In this experiment this hypothesis could not be confirmed.

As there are indications that harmine favours the occurrence of parapsychological phenomena (Hoffer & Osmond 1967) - it is sometimes called telepathine - some experiments (series 58 and 69) were carried out to see if the intake of harmine results in high scoring under the conditions of the experiments described in this paper. As Table I shows, somewhat above chance scoring was obtained: 3000 trials with 528 hits (MCE = 500). For the calculation of hits in first halves of series and second halves of series (Table II), the series 58 and 69 have been omitted.

SOME THEORETICAL CONSIDERATIONS

Influence on the outcome of a throw with a die, as described here, may, very tentatively, be explained by assuming that the subject, unconsciously, knows how to shake the cup to obtain the 4-face. So we should have to do, in this type of PK experiments (one die, cup shaken by hand) with a so-called motor automatism.

Independently of the author, F.W. Knowles came to a similar explanation for extra chance scoring in dice throwing (Knowles 1972). Knowles, however, uses in his mechanism clairvoyance and precognition

which the present author, it must be stressed, does not.

In the next paper, experiments will be described where the hypothesis mentioned above can be put to a test.

TABLE I

Series	Number of trials	Conditions of the experiment	Number of hits
32	6000	Subject consumed 0.5 l of beer	1016
33	6000	-	1062
34	6000	It was not always possible for the subject to work alone	960
35	6000	Subject under influence of 600 mg meprobamate. Only 2 runs weekly.	994
36	6000	-	1020
37	6000	-	994
38	6000	-	1016
39	6000	-	1014
40	6000	-	1023
41	6000	-	1008
42	6000	-	1024
43	6000	-	995
44	6000	-	1057
45	6000	-	967
46	6000	-	1021
47	6000	-	1026
48	6000	-	1025
49	6000	-	968
50	6000	-	972
53	6000	-	1005
54	6000	-	1010
55	6000	-	971
56	6000	-	1054
57	6000	-	1020
58	700	Subject under influence of 200 mg harmine hydrochloride; only 1 run	130
59	6000	-	1034
60	6000	-	1033
61	6000	-	964
64	3000	-	500

TABLE I

(continued)

Series	Number of trials	Conditions of the experiment	Number of hits
68	6000	-	1036
69	2300	Subject under influence of 200 mg harmine hydrochloride (run 1 and 2) and 225 mg harminehydrochloride (runs 3,4 and 5)	398
70	6000	-	982
71	6000	-	985
72	6000	-	1002
73	6000	-	968
74	6000	-	981
75	6000	-	981
76	6000	-	1054
77	6000	-	1037
78	6000	-	1037
79	6000	-	996
80	6000	-	1069
Total	240000		40409

TABLE II

Total number of hits

In first halves of series	20,040
In second halves of series	19,841
In first halves of runs	20,476
In second halves of runs	19,933
In first halves of groups of 100 trials	20,159
In second halves of groups of 100 trials	20,250
In left halves of groups of 100 trials	20,136
In right halves of groups of 100 trials	20,273

TABLE III

Frequencies of the numbers that were thrown

1	2	3	4	5	6
39,773	40,044	39,987	40,409	39,980	39,807

ABSTRACT

By applying a certain stopping strategy, it seems that reproducible above chance results in PK experiments with dice can be obtained. The author carried out 42 experiments with the 4-face as target. Total number of trials: 240,000; Total number of hits: 40,409; MCE: 40,000; P = .01 (one-tailed).

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TOWARDS REPRODUCIBLE EXPERIMENTS IN PSYCHOKINESIS

II EXPERIMENTS WITH A ROULETTE APPARATUS

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Experiences in gambling houses suggested that with roulette, the operator of the wheel may have some influence on the outcome of a trial. In view of this it was hypothesized that it would be, perhaps, easier to obtain reproducible above chance results in psychokinetic experiments with a roulette apparatus than with a die.

This hypothesis could be verified. The second roulette experiment with our own apparatus yielded already a significant above chance result (P = .01). Experiments in gambling houses were also successful (P = .03). In three of these houses H.B. was allowed to operate the wheel while gambling. Two of them were beaten and H.B. was no longer allowed to operate the roulette. In a third one the experiments are still going on.

EXPERIMENTAL PART

1 Experiments with our own apparatus

The apparatus was of the type as in use in Europe, numbers 0 - 36, 18 numbers on a black background, 18 on a red one, while the 0 was on a green background. For the first series (series no. 62; see for numbering of series previous paper, table I) the 0 was, rather arbitrarily, chosen as the target. This series comprised 3700 trials and was made up of several runs which were composed of groups of 25 trials. As in the dice experiments, the number of groups of (in this case) 25 trials depends on the results of these groups: A run is continued until a group with a number of hits above MCE (1 or more) appears and stopped after the first group with a number of hits below MCE (0). Only one run daily. As usual, the methods of statistical analysis were planned beforehand. They comprised: number of hits and corresponding values for P of the series, first half of the series, second half of the series,

frequencies of all 37 numbers and sum of the frequencies of the nine numbers that are situated to the left of the target and the nine numbers to the right of the target.

The result of this first experiment was disappointing: only 96 hits, where MCE = 100. The only interesting aspect was the high frequency of the number 10: N = 127. As this phenomenon might be caused by an unconscious preference of the author for the number 10, it was decided to carry out an experiment (series no. 63) similar to series no. 62, but with the number 10 as target. Here the result was significant: 123 hits; P = .01 (one-tailed). Number of hits in first halves of the series: 62; number of hits in the second half of the series: 61. The frequency of the 18 numbers in the neighbourhood of the target: 1793; MCE = 1800. Of the frequencies of the 37 roulette-numbers only those will be mentioned where there are indications that they are not due to chance:

Number	Frequency	P (two-tailed)
10	123	.02
20	77	.02
22	127	.006
28	67	.001

2 Experiments in gambling houses

Series no. 62 and no. 63 suggest that the author has a preference for the number 10 when operating a roulette apparatus. Now it was tried if this phenomenon could be put to a practical purpose: making money by gambling. Three owners of illegal gambling houses, J.v.H., J.M. and H.Be., were willing to let H.B. operate the roulette. J.v.H. gave up after 87 runs; J.M. after 15 runs. In the gambling houses of H.Be the author was not so fortunate. Here the experiments are still going on.

The 87 runs in the gambling house of J.v.H. comprised 2394 trials with 78 hits; MCE = 64; P = .05 (one-tailed). Financial result: + *f* 3070.

In the gambling house of J.M. the above mentioned 15 runs comprised 1264 trials with 37 hits; MCE = 34.2. Financial result: + *f* 89.

With H.Be. as opponent, 36 runs have been carried out up till now (4/6/'74): 808 trials yielded 26 hits; MCE = 21.8. Financial result: - *f* 544.

On combining the experiments in the gambling houses, there is a

total of 4466 trials with 141 hits; MCE = 120.7; P = .03 (one-tailed). Combination of the series No. 63 with the gambling experiments yields 8166 trials with 264 hits; MCE = 220.7; P = .002 (one-tailed).

In most of the gambling experiments, the 10 was not the only target. Stakes were put on other numbers too. These aspects of the experiments in the gambling houses will not be considered here, nor will be the strategies of money investment, which are of major commercial importance but not so interesting from a parapsychological point of view.

DISCUSSION

From the experiments described above it may be concluded that the author had, at least while carrying out these experiments, a preference for the number 10. Now two questions arise. First: Why did H.B. select the 10 from the numbers 0 - 36? Second: How was this accomplished?

To answer the first question, one has to look after the symbolic nature of the number 10. According to F.C. Endres (1951) the 10 is a symbol of perfection, while L. Paneth (1952) relates it to marriage. The view of Endres seems here the most reasonable. By hitting the ten, the author seems to express his striving for perfection on an unconscious level. It is interesting to note, that, as a teacher he also strives consciously to have his pupils get the mark 10 for their examinations. So these experiments suggest that H.B. uses his quantitative parapsychological experiments to give expression to his feelings, to reveal something of his deeper levels of being: his fears, his love, his hatred and also the up till now little understood tendencies of self destruction, which are present in all of us. This view is supported by earlier roulette experiments that were carried out in the presence of someone to which H.B.'s feeling was very negative (Breederveld, 1966). Here the numbers 13 and 31 had frequencies that were, when combined, highly significant (4000 trials with 260 hits; MCE = 216.2; P = .001 one-tailed). In Europe, the 13 symbolizes misfortune. In Bloemendaal (The Netherlands), where H.B. lived for some years, this was consciously expressed by replacing in some streets the housenumber 13 by 9b. In Germany, in the lotto game, where weekly 6 numbers are chosen from the numbers 1 - 49 by an apparatus which is completely automatic and very carefully constructed, this is expressed on an unconscious level by avoidance of the number 13, which has of all the 49 numbers the lowest frequency. Up till now, there have been in this game 973 x 6 = 5838 trials with 93 hits for 13; MCE = 119.1; P = .005 (one-tailed).

To conclude with the second question: How was this hitting of the 10 accomplished? As in the paper on the dice experiments, it is assumed that we have to do with a motor automatism: the author aims at the 10. When this interpretation is correct, it is reasonable to suppose that the nine numbers to the left and the nine numbers to the right of the 10 will have a greater frequency than the other 18 numbers on the wheel. To the author's surprise, this was not the case for experiment no. 63: Number of hits for the 18 numbers in the vicinity of 10: 1793; MCE = 1800. Although he does it somewhat with dislike the author must admit that this result, which suggests an all or none process, casts severe doubt on his theory. As doe s the fact that above chance scoring may occur in PK experiments where several dice are thrown by hand with the aid of a cup.

ABSTRACT

When operating a roulette wheel, the author seems to have a preference for the number 10. The effect is rather consistent. 3700 trials with the author's own apparatus yielded 123 hits; P = .01 (one-tailed). Experiments in gambling houses where H.B. was allowed to gamble while operating the wheel himself, were marginally significant: 4466 trials yielded 141 hits; P = .03 (one-tailed). Combination of the experiments with the author's own roulette wheel and the gambling experiments gives 8166 trials with 264 hits; P = .002 (one-tailed).

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POSSIBLE INFLUENCES OF BIRTH ORDER ON ESP ABILITY

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INTRODUCTION

The present paper describes an experiment undertaken to investigate possible relationships between birth order and ESP ability.

For more than a hundred years, birth order effects have been investigated, and their fascination still continues.

Probably the first person to study the effect of birth order, on personality, was Sir Francis Galton, in 1874 (Galton, 1874). His subjects were eminent scientists, and he found that there were more eldest and only sons among them than would be expected by chance. Galton explained his results by reference to the law of primogeniture.

In 1904, Havelock Ellis confirmed Galtons findings (Ellis, 1904). Ellis also noticed that being the youngest child in the family was likewise a favourable condition for success in later life, although not as favourable as being born as eldest or only child.

Since the days of Ellis' studies the correlation between birth order and a lot of other psychological variables has been found in many different studies, in different parts of the world, and with different groups of subjects (Altus, 1966).

In the middle sixties, research-officers of the "Institute for Psycho-Physical Research" (Oxford, England) carried out an experiment to investigate birth order effects on ESP ability (Green, 1965; McCreery, 1973). The main prediction to be tested in their experiment was if first born or only children would score equal but different from younger children, in a simple card guessing task. They also predicted that birth order effects would be less marked among people of lower socio-economic status than among people of higher socio-economic status.

Their results show that first borns obtained the highest scores, only borns the lowest scores, and later born children an in-between

score. They also found that these results were significant for the higher socio-economic status class only. It should be noticed that these results were based upon a backwards displaced score (-1 hit). Direct hits (0 hit) showed insignificant results.

THE SRU BIRTH ORDER EXPERIMENT

From April 1975 until January 1976 the SRU carried out a birth order experiment as a replication of the experiment reported by Green (1965) and McCreery (1973). It has to be mentioned that a few modifications have been introduced.

Experimental set-up

The first modification involved the subject population approach. Green carried out her experiment on the readerships of a national magazine and a daily paper.

In the SRU experiment the subjects were tested individually or in small groups. The testing was executed by SRU research-officers and several part-time co-operators: the second modification.

Each of both experimenter groups carried out their part of the experiment with opposite expectancies with regard to the results. Although the experimenter expectancy is often used as an explanation for failure of replications, there has been little actual research on this topic.

Honorton, Ramsey and Cabibbo (1972) reported at the 1972 Parapsychological Association Convention significant effects on their subjects' ESP scores as a consequence of different experimenter attitudes. Adrian Parker (1974) reported at the 1974 Parapsychological Association Convention results that seem to demonstrate that the influence of expectancy on success and failure of ESP tests is a potent one.

To test the hypothesis that the experimenter expectancy could influence the results of an ESP test in a desired direction, both experimenter groups carried out the experiment in a similar way in the SRU experiment, with opposite expectancies.

The SRU-members' expectancy was based upon the results reported by Green:

- First borns were expected to obtain the highest scores in the ESP test.
- Only children were expected to obtain the lowest scores.
- Later born children were expected to obtain an in-between score. In addition, it was expected that last born children would obtain a higher score than middle borns.

The part-time co-operators were ignorant concerning Green's findings, and it was suggested strongly to them that:

- First borns would obtain the lowest scores in the ESP test.
- Only children would obtain the highest scores.

Concerning the scores of the later borns, the same expectancy as the SRU-members' was given.

The SRU-members' expectancy was defined as the "Positive Expectancy" (PE) and the part-timers' expectancy as the "Negative Expectancy" (NE).

It was planned beforehand that each expectancy-group would test 150 subjects on their ESP abilities.

A third modification concerned the target pool of the ESP test. In the Green experiment the target pool consisted of 25 Zener cards (an open random series), prepared in advance. All subjects were asked to guess after that 25 cards. In the SRU experiment each subject was asked to guess after 30 random numbers (from 1 to 6). Before carrying out the experiment, 300 distinct random number sets of 30 numbers each, were prepared by J.J., by aid of the Rand Random Number Table. Each set of 30 numbers was placed in an opaque envelope and locked up in a cupboard.

So, for each subject there was a distinct target set in the total target pool. In this way the stacking effect (success in an ESP test due to psychological response preferences rather than real ESP) could be avoided.

When all 300 subjects had been tested, the envelopes were assigned at random to a subject's score sheet, by means of a multistage randomization procedure (Sandelius, 1962).

The questionnaire to determine a subject's birth order

The questionnaire to determine a subject's birth order had to be filled in before the actual ESP test. It consisted of 18 questions. The first three questions concerned subjects' birth order directly. The remaining questions asked for more detailed information about the family structure. Only subjects coming from a "pure natural family" without complicated structures were taken as valids. All other subjects were rejected. More specific, subjects were rejected if:

- S(ubject) was a twin-part.
- S didn't spend his childhood (up to the age of 15) in his parental home.
- S' father (or mother) is married with another woman (man) than S' mother (father), provided there were children in that previous marriage.

- one (or both) of S' parents died during S' childhood (up to the age of 15).
- S' parents were divorced or otherwise separated during S' childhood.
- there was a miscarriage before S' birth.
- S was educated by someone else than his own father or mother.
- an illegitimate child was part of the family during S' childhood.
- an elder sibling was educated by someone else than S' parents.
- a foster-child was part of the family during S' childhood.

In cases which were not foreseen, the subject was rejected. It turned out that these criteria were rather severe, because of all subjects tested, about one-third was rejected.

The ESP test

Each subject was requested to guess after 30 random numbers (range 1 to 6), configurated in a 6x5 matrix.

For each subject there was a distinct target set. At the moment of guessing, subjects did not know which envelope, containing one set of 30 random numbers, would be assigned to their call sets. The entire pool of target sets was prepared in advance.

So ESP could be explained in terms of telepathy, clairvoyance, or precognition. On the other hand, the target sets were assigned at random to the subjects' call sets by J.J.. This implies that any effect that would occur, could, in fact, be the result of a subtle experimenter effect. And also the effect of the checker must not be overlooked (all sheets were checked by H.B., later on rechecked by J.J.). In brief, if any effect shows up significantly, it must be attributed to GESP.

If an ESP test record sheet had not been filled in correctly, it was rejected.

DATA ANALYSIS

The data obtained by the ESP test have been analysed by an analysis of variance. Actually, it was a 4x2x2 factorial experiment, with 4 birth order categories (OB, FB, LB, MB, respectively only borns, first borns, last borns and middle borns), both sexes and both expectancies.

The analysis comprises the main effects:

- birth order
- sex

- expectancy

and the interactions:

- birth order × sex
- birth order × expectancy
- sex × expectancy
- birth order × sex × expectancy

Green analysed her data for three hit positions: direct hits, -1 and +1 hits. In the present experiment only direct hits are taken into account, determined by the experimenters' individual interests.

RESULTS

454 subjects were tested, of which 154 were rejected, most of them

TABLE 1

Distribution of subjects, total number of hits for each subset, and corresponding mean ESP scores

	Expectancy			
	PE		NE	
birth order	Sex M	Sex F	Sex M	Sex F
OB	N = 4 T = 15 s = 3.75	N = 4 T = 18 s = 4.50	N = 3 T = 17 s = 5.67	N = 5 T = 24 s = 4.80
FB	N = 36 T = 167 s = 4.64	N = 19 T = 96 s = 5.05	N = 27 T = 135 s = 5.00	N = 27 T = 119 s = 4.41
MB	N = 44 T = 234 s = 5.32	N = 15 T = 75 s = 5.00	N = 42 T = 221 s = 5.26	N = 23 T = 130 s = 5.65
LB	N = 21 T = 114 s = 5.42	N = 7 T = 34 s = 4.85	N = 12 T = 45 s = 3.75	N = 11 T = 53 s = 4.82

on the severe birth order criteria, and some on not correctly filled in ESP record sheets.
Distribution of subjects over the various categories is shown in table 1. Also shown in table 1 is the total number of hits for each subset of subjects, and the corresponding mean ESP score. A summary of results of the analysis of variance is given in table 2.

TABLE 2

Summary of results of analysis of variance

source of variation	SS	df	MS	F	P
birth order	23.90	3	7.96	1.79	>0.10
sex	0.34	1	0.34	>1	-
expectancy	0.27	1	0.27	>1	-
birth order x sex	0.10	3	0.03	>1	-
birth order x expectancy	17.63	3	5.87	1.32	-
sex x expectancy	0.00	1	0.00	>1	-
birth order x sex x expect.	20.97	3	6.99	1.57	>0.10
within cell	1258.97	284	4.43		

DISCUSSION

The results of the analysis of variance point out that none of the main effects or interactions reach the level of significance.

A possible explanation for the failure to replicate Green's findings could be the assumption that birth order effects show up strongest in higher socio-economic populations. In the present experiment, subjects have been sampled from a population of predominantly middle class status. Green also noticed that the birth order effects are related to family size: stronger birth order effects were found in larger families. She suggested that the observed effects could, in fact, be disguised family size effects. The present authors were mainly interested in pure birth order effects, therefore family size was not taken into account.

One interesting feature emerging from the results here reported, is the low overall mean ESP score, although insignificant, of the only borns, which is in line with Green's findings. After a few attempts to replicate the Green experiments, McCreery concludes that the only children are the "floating voters"; sometimes they

score like the eldest children, sometimes they score like the later borns (McCreery, 1973). Concerning paranormal abilities, it seems that the role of the only child is consistent with data gathered from research on birth order and other psychological variables: the only child does not fit the general pattern (Zajonc & Markus, 1975). The failure of only children to fit the pattern of birth order results in psychological research has never been understood. Alfred Adler believed that order of birth was influential in the channelling of the socially very significant power drives (Adler, 1928).

Of course there is a big difference between only borns and children with siblings. The only child never had to share his parents' affection and attention with others. It is accustomed exclusively to the society of adults. Its strivings are not developed by competition, and the care which the parents were free to lavish on it makes it view the world outside the family as a very unsheltered place. It may be apt to a general anxiety for anything it is not familiar with. In the present authors' opinion this anxiety aptitude may be correlated with the suggested psi-missing of the only children.

There have been carried out several experiments to relate a subject's anxiety level to his ESP scoring. Freeman and Nielsen (1964) found that high-anxious subjects obtained higher scores on an ESP test than low-anxious subjects, which is in contradiction with the hypothesized high anxiety of the only children. On the other hand, Rao (1965) found the opposite result. In both of these studies the Taylor Manifest Anxiety Scale was used. Johnson and Kanthamani (1967) have suggested that this questionnaire measures anxiety on the conscious level. They tried to measure anxiety on a deeper conscious level by means of a projective test, the Defense Mechanism Test. Their data revealed that a higher degree of anxiety is likely to lead to psi-missing, while a low level of anxiety tends to favour psi-hitting.

It seems reasonable to focus further birth order research on the psi scoring direction of the only born children, as has been brought forward in the follow-up experiment described below.

ONLY CHILDREN AS POTENTIAL PSI-MISSERS: A FOLLOW-UP EXPERIMENT

The data of the birth order experiment described above indicate a psi-missing tendency of the only children. Sixteen only children participated in that experiment with a total number of 480 trials; number of hits: 74, MCE: 80. Because the hypothesis that only children tend to psi-missing seems reasonable, and is supported by the findings of other researchers (McCreery, 1973), it was decided to carry out a follow-up experiment with only children,

to test this hypothesis.

Beforehand it was planned to test 15 only born subjects; the subjects participating in the foregoing experiment had pride of place.

Each subject had to guess after 30 random numbers (range 1 to 6). For each subject there were 20 such target sets. So each subject made 600 trials. The target sets were prepared in advance by a SRU research officer not otherwise involved in this experiment, by aid of the Fisher-Yates Random Number Table. Each target set was put between black cardboard sheets and placed in an opaque envelope.

The subjects were asked to obtain as much as possible direct hits, but they were also told that there were some indications that they would not score above chance. Having guessed after a target set of 30 random numbers, the subject was asked to compare his calls with the targets, and the test continued with the next target set. Each subject made his total of number of calls in one session. All corresponding target-call sets were later on independently checked by the experimenters.

The data analysis, planned in advance, consisted of P-overall, one tailed for psi-missing of direct hits and P per subject, one

TABLE 3

Individual and overall scores of the only children in the follow-up experiment

Subjects	hits	dev.	CR	P
S1 (a)	103	+3		
S2 (b)	112	+12		
S3 (a)	84	-16	1.75	0.04
S4 (b)	100	0		
S5 (b)	93	-7	0.76	
S6 (a)	85	-15	1.64	0.05
S7 (b)	89	-11	1.20	0.11
S8 (a,b)	91	-9	0.98	
S9 (a)	94	-6	0.65	
S10 (b)	101	+1		
S11 (a)	78	-22	2.40	0.008
S12 (a)	92	-8	0.87	
S13 (b)	96	-4	0.43	
S14 (b)	119	+19		
S15 (b)	98	-2	0.21	
Overall	1435	-65	1.84	0.03

(a): Tested by JJ or LV; (b): Tested by HB

tailed for psi-missing. The results are given in table 3. The testing was executed by HB, and JJ assisted by a fellow researcher, LV.

DISCUSSION RESULTS OF THE FOLLOW-UP EXPERIMENT

As table 3 shows, just a few of the subjects reach a P-value near the significance level. The overall score and associated probability are in the desired direction. Although the hypothesis that only children are potential psi-missers is not confirmed by a sharp P-value, the result of this follow-up experiment points in the direction of confirmation. However, one has to take into account that the suggestive evidence of confirmation may be due to an experimenter effect.

Ad hoc analysing the results of this follow-up experiment shows that eight subjects tested by HB alone obtained 808 hits with MCE= 800, while subjects tested by or in the presence of JJ and LV obtained 627 hits (MCE=700). This differential effect gives $t=2.42$ ($df=13$), $P=0.01$ one-tailed for psi-missing.

Being an only child himself, HB dislikes very much the idea that the only born would be a potential psi-misser, and therefore is strongly motivated to obtain positive deviations from his subjects. On the other hand, JJ and LV, both having younger and/or older siblings, missing such a motivation entirely, like their low scoring subjects.

So, it still remains an unanswered question: does the experimenter cause the low scores of his only born subjects, does the only child has a tendency to low scoring, or is it the experimenter-subject combination that leads to the actual scores?

CONCLUSIONS

While the effect of birth order on ESP scoring does not show any significance it seems reasonable to focus further birth order research with relation to ESP on the only children. On doing so, one must realize that any effect that can show up, may be biassed by the experimenter.

In the near future the present authors intend to carry out a similar experiment with only children as described in the follow-up experiment. In addition, it is planned that each of the authors will test 15 only borns. The data thus obtained will also be analysed on the differential effect of the experimenter for psi-missing.

SUMMARY

In experimental psychology the effects of birth order have been studied for more than a hundred years. In the middle of the last decade birth order entered the parapsychological scene by a study of Celia Green. Although not identical, the present experiment can be seen as an attempt of replication. Because the experimenter expectancy is often used as an explanation for failure of replication, the experimental set up of the experiment to be described here, takes into account this bias effect. Nevertheless, no significant results were obtained.

Yet it seems worthwile to focus further birth order research in parapsychology on the only children, because there are indications that they show psi-missing tendencies. The results of a follow-up experiment point in that direction: An ESP test on 15 only born subjects yields 1435 direct hits, MCE=1500. P one tailed for psi-missing: 0.03.

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TESTING THE BACKSTER EFFECT

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METHOD

An egg electrically contacted with ECG electrodes and electrode paste was connected as one branch of a Wheatstone bridge. The bridge was supplied with an AC 1000 Hz sine wave, 10mV peak to peak. The bridge difference voltage was amplified and detected by a phase-locked amplifier with the AC supply voltage as reference.

The low-pass filtrated output of the phase detector was displayed on an X-t recorder. The system exhibits extreme suppression of undue electrical interference from the environment, thanks to differential input with high common-mode rejection and the phase-locked detection.

In the same room, at a distance of about 2 meters, eggs were boiled. The exact time an egg was dropped into the boiling water was marked on the recorder. In a few experiments 2 or 3 eggs were dropped at the same time. No electro-magnetic screening was used and the boiling was not chemically separated from the detector egg, as the intention was to make it easy for the effect to occur, whatever its origin.

ANALYSIS

The patterns were manually analysed by finding repetition rates of pulses with similar form and amplitude. After a careful analysis less than one in two hundred pulses of appreciable amplitude remained unsolved. There also remained some very low level noise from which patterns can not be objectively resolved. The different rythms were marked with different coloured pencils.

RESULTS

The patterns were found to be very stable. We found superimposed rythms with duty-cycles ranging from a few seconds up to seven

minutes. The four different eggs used as detector had different characteristic patterns. No changes in their patterns were found in any experiment performed by physicists in the laboratory.

However, in an extra session, in the presence of an experimenter who had previously obtained positive results one experiment in four showed rather dramatic changes: 1) A significant shift of base line which was restored after a few minutes and 2) Addition of a new rythm, which again disappeared after about seven minutes. These changes could not be conclusively correlated to the dropping of an egg into the boiling water.

DISCUSSION

There may be such a thing as the Backster effect. It is not a reliable detector for incidents causing damage to organisms in the environment. The attitude or mediumistic abilities of the experimenters may play an important role and, if this is the case, the Backster effect can not be explored scientifically from a physical viewpoint.

The biological rythms are interesting enough for a separate study of their origin and location. An understanding of the timing pattern may prove more useful for natural science than the Backster effect.

ABSTRACT

It has been claimed by experimenters in the field of parapsychology that organisms like eggs and plants are in a state of communication with each other which causes changes in their biological rythms when organisms in their surroundings are severely damaged. The effect has been claimed to be easily distinguishable and of frequent occurrence.

In a series of 21 experiments in a scientific environment all were negative.

However, in an extra session with an experimenter present who had previously obtained positive results one in four experiments showed changes in the bio-rythm pattern.

PK ON RADIOACTIVE DECAY

Stig Ollmar
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METHOD

Description of the experiment

A neutron-activated sample was put in a fixed position near a radiation detector of the Geiger-Mueller type. After some time the sample was taken away from the detector and the subject (Matthew Manning) tried to influence it by paranormal means. Then the sample was put in the same position as before near the detector, where the activity was measured again during a couple of time intervals.

The G-M detector consisted of a Geiger-Mueller tube, properly driven, which was connected to a counter. The counter had a display with lamps sited in circles which were lit to indicate numbers 0-9. The dead time of the tube was approximately 5.10^{-6} minutes and was neglible as the counting rates were always less than 4.10^{3} min^{-1}. The correction for this is thus always less than 0.2%. The main background intensity was recorded to be approximately 60 counts/min..

Analysis

The interesting quantity is the logarithm of the number of counts on the G-M counter during appropriate time intervals, where the mean background activity has of course been subtracted. This quantity, $\ln N_{corr.}$ is then plotted versus time on a chart. For neutron-activated indium which has decay times around 54 min. we should then obtain a straight line for the undisturbed decay. For activated silver which has two main decay times, 0.46 resp. 2.42 min., we should get a curve which has two asymptots, one near t=0 where the fast decay dominates and one for larger times where the other decay time dominates. For the area in between we should get an interpolating curve which looks very much like a part of a hyperbola. Our hope was that the subject would be able to speed up

or slow down the radioactive decay when he was manipulating the sample. In that case the remaining activity should be smaller resp. greater and the last part of the curve should be lower resp. higher.

Due to the fact that the activity in our samples was quite low we obtained quite high statistical errors and the plotted points were not precise enough to interpret the curved character of the hyperbola as curves in the case of silver. Instead we simply drew two straight lines, one to fit the first points in the interval before the paranormal influence and one to fit the points after this. One would then ideally like to have a normal test series with no paranormal elements. As we suspected at an early stage that our test would be rather inconclusive the latter was not realised, as this would involve a lot of work. Instead we used a 6 year old protocol which has small statistical errors, and where a good hyperbola curve is drawn. We then used relevant parts of this curve and drew straight lines that should approximate the relevant parts to the ones obtained in our experiment. These lines were then compared with our lines to obtain if and to what extent the activity level had been changed. It is very unclear to what extent this comparison is reliable, thus this is a very likely source of systematic errors. But as we consider these experiments more as a pilot study than as a conclusive test we did not pay to this matter the attention due.

To diminish the number of calculation errors all calculations and plotting were checked. Also to allow for a better survey of the results and in order to obtain smaller statistical errors we plotted the logarithm of the corrected activity during double time intervals versus time, instead of during a single time interval.

DISCUSSION

In the four tests, three seem to indicate that the remaining activity after the subject had tried to influence the sample had decreased with approximately 10%, and in one test a very small increase could be detected although this is not at all certain, due to the arbitrariness in the drawing of the lines.

Let us reason that the subject succeeded three times and failed once. Let us further assume that the a priori probabilities of failure and success are equal. Hence the probability of obtaining by chance a similar or more extreme result than ours should be $p = 4(\frac{1}{2})^4 + (\frac{1}{2})^4 = 31\%$. But as the subject could not tell before the experiment started in what direction he would try to change the radioactivity we have to take account of extremes in both directions when making the chance calculation. We get $p = 1-(\frac{4}{2}).(\frac{1}{2})^4 = 62.5\%$.

Taking systematic errors into account as well we raise the probability to, say, 70%.

Possible sources of error not previously discussed: a) The subject could possibly have tried to manipulate the sample in some nonparanormal way, although he was advised not to touch it with his bare hands as there is a definite risk involved when there is direct skin contact with an active sample. No attempts by the subject to influence the experiment by nonparanormal means were recorded although our checking of that was not fool-proof.
b) The sample could have been slightly displaced when it was put into the detector arrangement after the subject had tried to influence it.

COMMENTS

a) In this kind of experiment we hope to diminish the probability that the subject, if mediumistic, is influencing the equipment and not the sample.
b) The subject told us after the first experiment with silver that he had felt what he described as coldness emanating from the sample. In the experiment with indium he did not have this feeling but instead he felt some sort of a ray, up to a distance of 10 - 15 cm.. While trying to influence a sample he held his hand (fist) slightly above it, approximately 10 cm., and looked to be concentrating.

SUGGESTIONS

To obtain more conclusive results and also to facilitate the analysis one should use a detector with energy discrimination to single out just one decay mode. Thus only one exponential decay is studied. The half-life of that decay ought to be short to make possible the measurement of a small influence on the decay rate. The activity ought to be sufficient in order to make statistical errors tolerable. Of course the activity should not be dangerous for the subject or the experimenters. Then one could for example measure the accumulated activity during one block of time. Hence by extrapolation one can find the start activity if one knows the time elapsed. Then the subject is asked to try to influence the sample. Afterwards, the activity during the next block of time can be measured and compared with a value which is calculated by using the start activity. The statistical errors should be smaller when using this method compared to the one we have used in our experiment.

ABSTRACT

The subject tested (Matthew Manning) was asked to try to influence the decay of three activated samples of silver and one of indium. The activity was measured before and after the would-be paranormal manipulation, but not during it. This design was made to eliminate the possibility that the subject was influencing the detector equipment and not the sample.

Our results showed that no clear effect was obtained. This was partly due to details in the design of the experiment, which was not ideal because of a shortage of time. A rough statistical estimate shows that the probability of obtaining a result like ours or a more extreme one by chance is $p = 0.7$. When one also considers systematic errors the probability will be even greater. These results are not very conclusive although they are at least slightly encouraging.

AVAILABILITY OF DATA

Copies of tables and graphs presenting the results of this experiment are available on request from the Parapsychology Laboratory.