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SUBJECT. I. SINGLE-CARD CLAIRVOYANCE**

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CARD EXPERIMENTS WITH A SPECIAL SUBJECT. I. SINGLE-CARD CLAIRVOYANCE

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ABSTRACT: Four series of experiments were carried out with the exceptional subject B.D. In these tests the subject guessed playing cards taken one at a time from a large pool of such cards and then enclosed in a black folder. The data were analyzed by an adaptation of Fisher's method for each series separately and for the pooled data. Significant results were obtained in all four series separately, as well as in the pooled data. The main effect was a large excess of exact hits, precisely three times mean chance expectation, giving a CR of 13. Moreover, this number of exact hits is much larger than would be expected on the basis of chance association of the independently significant tendencies to hit numbers ($CR > 7$) and to miss suits ($CR < -3$). The chi-square for association between number hits and suit hits corresponds to a CR of 5.8, showing that B.D. tended to get the whole target if he got either of its component attributes.

Historically, parapsychologists have been on the lookout for "special" subjects for the obvious reason that with these subjects psi can be made to manifest relatively reliably in laboratory tests. Consequently, meaningful experimental manipulations with such subjects have often proved rewarding. It is interesting to observe that a small number of special subjects at the early experimental stage of parapsychology enabled workers in the field to achieve rapid progress at that period.

Such considerations led several researchers to carry out extensive experiments with a special subject, B.D.,² in 1972 and 1973. A preliminary report on this subject (Kelly & Kanthamani, 1972) described his initial efforts in a variety of laboratory tests at the Institute for Parapsychology. He proved to be highly successful in these tests. Subsequently, he obtained a year's leave of absence from the Yale Law School and, with the aid of a grant from the Hodgson Fund (of Harvard University), was able to participate further in the research at the Institute. At the same time, in the fall and winter of 1972, Professor Irvin L. Child, also from Yale (Department of

¹ Formerly known as B. K. Kanthamani. According to an Indian custom, her marriage changes her name to H. Kanthamani.

² Bill Delmore, a student of law from Yale University.

Psychology), spent a sabbatical semester at the Institute, in part carrying out experiments with this subject.

Child introduced a simple technique of clairvoyance testing with playing cards which he called the "single-card clairvoyance" method. This method bears some resemblance to the classical BT technique in that it provides the subject with one target card at a time. Here every single trial presumably presents itself as a unique challenge for the subject to focus his psi. Child conducted a long series with B.D. (65 runs of 52 trials each) the results of which gave evidence of success only on suit hits ($P < .01$). This was a drop in B.D.'s scoring from his general level on a variety of tests the preceding summer and it motivated the present authors to initiate a new series to follow up Child's work, the main intention being to see whether B.D. could raise his scoring level with a change in experimenters. Using essentially the same single-card clairvoyance procedure, they carried out four series of experiments between October 1972 and April 1973. These form the subject matter of the present paper. Another series of experiments conducted around the same time used what may be termed the "shuffle method," in which the subject shuffles a deck of cards to match the target deck. These will be reported in a later paper.

METHOD

Materials

Playing cards. Ten decks of 52 playing cards were used for the experiment. The 520 cards were thoroughly shuffled by hand and placed loosely on edge in a row in a rectangular cardboard box. The backs of all the cards were uniform, since they were of the same brand. The decks were replaced by brand new decks three times during the experiment.

Folders. Rectangular black opaque folders, $3\frac{3}{4}'' \times 2\frac{3}{4}''$ were used to enclose the target cards. The folders were also changed frequently.

Procedure

The experimenter (H.K.) and the subject were seated on opposite sides of a large office desk. The box containing the target cards was kept in a bottom drawer of the desk, on the experimen-

ter's side, and thus was completely out of the subject's view. At each trial the experimenter selected one card from the box at random and slipped it into the folder, all this out of the subject's view. She then held it up where the subject could see. The folder containing the target card was about 6 to 8 ft. from the subject, the back of the target card facing him within it. The experimenter took special care not to see the face of the target card herself. Also, before holding up the folder, she made sure that it enveloped the target card completely. She held it by its lower left corner, thus affording a clear view to the subject for as long as he wished, until he made a call.

When the target folder was presented to his view, B.D. usually made a quick response. The experimenter, still holding up the target folder, immediately recorded the call. She then slipped the target out of the folder and recorded the identity of the target card beside the recorded call. Thus the subject had immediate feedback as to how well he had done. The experimenter then removed the target card from the table and set it aside. The same procedure was repeated for every trial (except for a total of 179 nonfeedback trials interspersed at the subject's request among the regular trials in groups ranging in number from 4 to 26).

Usually only one run of 52 trials was completed during a session. The subject took a break whenever he needed it, usually at half-time, (i.e., after 26 trials). During this interval the experimenter, in the absence of the subject, collected all the target cards used thus far in the run and shuffled and reinserted them into the large pile of cards remaining in the box, taking care to disperse them throughout the target pile. The experimenter was careful to deny herself any conscious knowledge of the order of the cards in the box. Also, periodically, between runs, the entire pool of 520 cards in the box was thoroughly shuffled. The folders used to conceal the cards were also changed after every few runs. The procedure denied the subject any opportunity to have tactile contact with the targets.

In all, there were four series in the experiment. The length of each one was determined before the series was started. The first two consisted of 13 runs each (676 trials) and the last two, of 10 runs each (520 trials). The first series was intended as a pilot, which was followed by the second as a confirmatory series. A special feature was introduced in Series 3, in which the subject was requested

to make "confidence calls" whenever he experienced a strong feeling of success associated with a call. Also, a co-experimenter (H.H.) was present during all sessions of this series to assist the main experimenter (H.K.) by careful observation of all aspects of the procedure, especially the recording.

It was planned that the fourth and final series would be carried out by a different experimenter. Accordingly, H.H. took H.K.'s place in selecting the targets and presenting them to the subject. However, H.K. was also present as an assistant in most sessions of that series.

In addition to H.H., who was a regular observer in Series 2, 3, and 4, others from the FRNM staff were present as observers at various times in these series. Interested visitors were also allowed to watch during some sessions, since their presence seemed to motivate the subject toward better performance.

Methods of Analysis

In an experiment with playing cards as targets, many different kinds of hits can be scored. In the present experiment, the overall evidence for ESP was first assessed by a method devised by Fisher (1924). Briefly, Fisher³ analyzed the possible relationships of the call card to the target card on a given trial into a set of nine mutually exclusive and exhaustive classes and provided a set of scores for these classes such that the average of the scores for a series of N trials follows, under the null hypothesis, a normal distribution with mean zero and variance $100/N$.

The definitions of the nine scoring types are provided at the foot of Table 1. Note first that by keeping track of the scoring in these categories separately, one can obtain a useful extension of Fisher's method: the nine classes, each with its relative frequency, collectively define a multinomial distribution, (i.e., an extension of the binomial to more than two outcomes). Then an approximation to the exact multinomial probability of a chance distribution of scores at least as extreme as that observed is supplied by the ordinary chi-square

³ Fisher's original scoring system was used rather than his later version (Jephson, 1928-1929), which scores face cards and plain cards separately to eliminate a slight effect of call preference in the earlier system. Since that effect penalizes subjects who favor face cards, and since B.D. showed a slight tendency to favor face cards, the reported results by Fisher's test should be slightly conservative.

Table 1
SUMMARY OF RESULTS BY FISHER'S METHOD

Scoring Type ^a	Series 1								
	OO	OC	OR	CR	SO	SR	ON	CN	SN
Expected score	120.0	60.0	192.0	96.0	60.0	96.0	26.0	13.0	13.0
Observed score	137	63	201	79	47	77	40	15	17
	Fisher $CR = -.34$ (n.s.); $\chi^2 = 21.6$ (8 <i>df</i>); $P < .01$								
Scoring Type ^a	Series 2								
	OO	OC	OR	CR	SO	SR	ON	CN	SN
Expected score	120.0	60.0	192.0	96.0	60.0	96.0	26.0	13.0	13.0
Observed score	89	41	175	101	44	90	34	42	60
	Fisher $CR = 11.25$; $\chi^2 = 256$ (8 <i>df</i>); $P < .001$								
Scoring Type ^a	Series 3								
	OO	OC	OR	CR	SO	SR	ON	CN	SN
Expected score	92.3	46.2	147.7	73.8	46.2	73.8	20.0	10.0	10.0
Observed score	86	55	123	69	41	67	26	24	29
	Fisher $CR = 5.39$; $\chi^2 = 64.8$ (8 <i>df</i>); $P < .001$								
Scoring Type ^a	Series 4								
	OO	OC	OR	CR	SO	SR	ON	CN	SN
Expected score	92.3	46.2	147.7	73.8	46.2	73.8	20.0	10.0	10.0
Observed score	88	37	124	83	48	70	20	18	32
	Fisher $CR = 5.18$; $\chi^2 = 61.6$ (8 <i>df</i>); $P < .001$								
Scoring Type ^a	Pooled Series								
	OO	OC	OR	CR	SO	SR	ON	CN	SN
Expected score	424.6	212.4	679.3	339.7	212.4	339.7	92.0	46.0	46.0
Observed score	400	196	623	332	180	304	120	99	138
	Fisher $CR = 10.73$; $\chi^2 = 268$ (8 <i>df</i>); $P < .001$								

^aScoring types are as follows: OO means no correspondence between call and target; OC means color only (not suit); OR means rank only (both face cards or both plain cards, not matching in number); CR means color and rank; SO means suit only; SR means suit and rank; ON means number only; CN means number plus color; SN means suit and number (i.e., an exact hit).

goodness-of-fit test, based on the observed and expected frequencies in each class. Furthermore, each of the classes regarded separately follows a binomial distribution. Although these are not independent (since any eight determine the ninth), it is appropriate to explore the sources of an overall effect in terms of further tests on the individual classes, each such test using either the binomial or, equivalently, a chi-square on that class versus all others pooled. Such secondary analyses should, of course, be regarded cautiously, since they are data-guided.

We were particularly interested in the three kinds of hits that

the subject himself was explicitly aiming for, namely, suit hits, number hits, and especially exact hits (both suit and number correct). These categories are not independent, since an exact hit is both a number hit and a suit hit; accordingly, for number and suit we have evaluated hits both including and excluding "exacts." The inclusive test uses binomial probabilities of $1/13$ and $1/4$, respectively; and the exclusive test pools the appropriate classes of Fisher's scheme (number only and number plus color; and suit only and suit plus rank, respectively) to get a chi-square versus all other classes.

RESULTS

The basic results by Fisher's method are provided in Table 1 for the four series separately and for all 46 runs together.

Series 1 and 2 each consisted of 13 runs, or 676 trials. The overall Fisher *CR* for Series 1 was nonsignificant, but the distribution of scoring across the nine classes departed significantly from expectation. The largest contributor to this effect was the excess of number-only hits. Including exacts, the number hits averaged 5.54 per run with a *CR* of 2.89, against the MCE of 4 per run. If exacts are deleted, the *CR* drops slightly to 2.56. Suit hits averaged only 10.85 per run, including exacts, for a significant negative *CR* of -2.49 . With exacts excluded, the *CR* drops further to -3.16 . Exact hits averaged 1.31 per run, above the MCE of 1 but not significant.

Series 2 by itself constituted a highly successful performance. The overall Fisher *CR* is over 11, and the chi-square for distribution of scores across categories is over 256. Both of these results depend primarily on the large excess of exact hits. For the 13 runs, B.D. averaged 4.61 exact hits per run, with a range from 1 to 8, corresponding to a *CR* of 13. The strongest run of the entire experiment was run 7 of this series in which he obtained 8 exact hits, plus 16 additional number hits of which 13 were also color hits. Including exacts, number hits averaged 10.46 for the series, with a *CR* of 12. With exacts deleted, the *CR* is about 6. Including exacts, suit hits averaged 14.92 per run ($CR = 2.22$); but if exacts are deleted the effect is almost reversed ($CR = -1.96$).

In Series 3 and 4, consisting of 10 runs each, the scoring appeared to stabilize at a level which was still very high though not so spectacular as that of Series 2. For Series 3, the Fisher *CR* is

5.39, and the score distribution chi-square is over 64. Again most of the effect was concentrated in the excess of exact hits and, to a lesser degree, number-plus-color hits. In this series B.D. averaged 2.9 exacts per run, giving a CR of 6. Number hits, including exacts, averaged 7.9 ($CR = 6.4$); and with exacts removed, the CR remains highly significant ($CR = 3.6$). Suit hits were insignificantly above chance with exacts included, and insignificantly below chance with exacts removed.

The Fisher CR for Series 4 is 5.18, and the score distribution chi-square is over 61. Here the effect was still more strongly concentrated in the exact hits, which rose slightly to 3.2 per run ($CR = 7$). Number hits averaged 7 per run including the exacts ($CR = 4.9$), but when the exacts were removed the CR became insignificantly positive. Suit hits were again insignificantly positive with exacts included, and insignificantly negative with exacts removed.

The four series show a similar pattern in their results, a pattern that is consistent in form, though varying in strength. Thus, when the series are pooled for overall analysis, this pattern emerges more conspicuously. For 2,392 trials, the Fisher CR is 10.73, and the scoring types chi-square is 268, both extremely significant. The main contributors are, in order, exacts, color-number hits, and number-only hits. The exacts averaged three times MCE, giving a CR of 13. There were 357 number hits, including exacts, which is almost twice the MCE of 184; this also yields a CR of 13. With exacts removed, the CR for numbers is still over 7. There were only 622 suit hits, where MCE is 598, and this excess is not significant. When the exacts were removed, the CR became strongly negative at -3.2 , suggesting some consistency of error in the calling of suits.

The large excess of exact hits and other number hits must, of course, be reflected in depletions of other scoring categories, but the question next arises as to whether these depletions were randomly distributed or operated selectively on particular scoring categories. As it happens, every one of the remaining categories showed some depletion, and the proportional departures from expectation are moderately uniform. The most conspicuous depletion, however, is in the suit-only category, which yielded a marginally significant negative CR of -2.3 .

The suit results, together with number results, suggest that B.D.

tended in general to miss on suits, but that when he got them, he tended to get them together with information about the number attribute. This was tested by constructing, for each series separately and for all together, a two-by-two table showing the hits and misses for the number attribute and suit attribute separately. The chi-square test of association showed that there was a significant tendency to get more exacts than would be expected by chance association of the observed tendencies to hit the component attributes separately. (The reader can reconstruct these tables from the data in Table 1.)

For the whole body of data this chi-square is 33.9, corresponding to a *CR* of about 5.8. The effect is also consistent through the four series. Although the chi-square is not significant in the first series, it is in the correct direction, and the other series are all independently significant, with chi-squares of 18.9, 4.56, and 10.2, respectively. In short, B.D. showed a strong tendency to hit numbers, a weaker tendency to miss suits, and a superimposed tendency to hit both attributes simultaneously. This is an interesting result, which departs from the pattern observed by Foster (1952), who, in reviewing a number of earlier studies with multiple-attribute targets, reported that the subjects of those studies appeared rather to make unitary ESP responses to the entire target. It is of some interest to note that B.D. himself seems to fragment the response task; i.e., he reports that he tries very hard for the number and then equally hard for the suit only if he feels fairly sure of the number. We are not confident of the generality of this description, however.

Another interesting aspect of this body of data is the comparison of feedback versus nonfeedback trials. There were, in all, 179 nonfeedback trials dispersed over 9 runs of the series, leaving a comparison set of 289 trials with feedback for the same 9 runs. In the 179 nonfeedback trials, B.D. obtained 15 exact hits and 31 numbers, corresponding to per-run rates of 4.36 and 9.0, respectively. The 289 feedback trials contained 13 exacts and 39 numbers, which represent rates of 2.34 and 7.02 per run. Although there is thus a suggestion that B.D. did better in a nonfeedback situation, the comparison is weakened by the fact that he tended to request nonfeedback trials at times when he felt "hot." The superiority of the nonfeedback trials is, in fact, contributed mainly by a set of 25 consecutive

trials in Series 3 in which he scored 7 exact hits plus 4 numbers and 5 suits.

This high-scoring episode is one of a number of apparent "bursts" in ESP activity scattered throughout the series. Such events are, of course, of great interest and importance in connection with efforts to discover physiological correlates of ESP performance. We hope eventually to carry out further card-guessing studies with simultaneous psychophysiological recording with B.D.

Finally, we wish to preview the results on confidence calls, although these will be presented in more detail, together with parallel results from the shuffle experiments, in a subsequent report. Altogether, only 20 confidence calls were made, with great effort on the part of the subject. Of these, 14 were exact hits and the remainder all partial hits, 5 being number hits, of which 4 were also correct in color, and the last a suit hit which was also correct in rank.

DISCUSSION

Experimental Conditions

The procedures employed in these experiments seem sufficiently rigorous to create a strong presumption that the effects reported are genuine ESP effects. However, the conditions could have been still more rigorous and therefore it is perhaps worth while to devote some further consideration to two relevant aspects of the procedure. The first concerns the use of folders, rather than envelopes, to conceal the target cards. Folders were strongly preferred by the subject, who attached great significance to the manner in which feedback was provided. The folders allowed a quick and clean exposure of the target. B.D. claimed that this was vital because his mode of ESP operation was based on a brisk parade of fleeting visual imagery and that it was important that the target should "come out" immediately after he chose an image, without any loss of time or manual clumsiness. After ensuring that the folders were quite as effective as the conventional envelopes in preventing sensory knowledge, the experimenters acceded to the subject's request in view of its possible psychological import. The fact that B.D. maintained a high scoring rate in the nonfeedback trials later suggested, of course, that quick exposure of the target was not, in fact, absolutely necessary, contrary

to his belief. The same fact also provides further assurance that the effects in the feedback trials were genuine. Finally, it may be recalled that the back of the card faced the subject, so that even if the card had on occasion slipped part way out, he would not have learned much from what he saw. As it happens, no such slippage was ever observed.

The second question concerns the quality of randomization in the target orders. Excess hits could conceivably arise through various forms of severe nonrandomness in target orders interacting appropriately with the subject's calling patterns. Given the high levels of scoring, all such possibilities would have been ruled out immediately had the target orders been generated by a rigorously random process. However, as described above, we used a relatively crude procedure of manual sampling plus periodic replacement. This was also done at the request of the subject, who disliked the idea of preordained target orders and greatly preferred the "chanciness" of selecting targets separately for each trial. The subject, of course, exerted no control over the selection process itself (unless by paranormal means).

In any case, we have looked in detail both at the overall frequencies with which the different targets appeared and the frequency with which targets followed each other. Details will be reported elsewhere. In summary, only very slight departures from randomness occurred and these do not interact in the required ways with the subject's patterns of calling and hitting. We conclude that our method of randomization was in fact adequate.

Further Prospects

Our main purpose in this report has been to provide a basic introduction to an unusually rich body of ESP data. A subsequent report will perform the same service for the shuffle experiments.

Many further kinds of analyses could be carried out beyond those reported here. Some of these we have already done, or plan to do. The most extensive investigation carried out so far concerns relations between consistent-missing patterns in this ESP task and in a visual task in which B.D. attempted to identify slides of playing cards projected tachistoscopically. This work was abstracted at the

1973 P.A. convention (Kelly, Kanthamani, & Child, 1974), and is the subject of a detailed report currently in preparation. We also plan to study this body of data for possible response-bias effects and for tendencies to produce bursts and clustering of hits.

Also, we have now assembled a large amount of material concerning personality and cognitive characteristics of the subject, B.D. A preliminary report is available⁴ and we have recently begun a more exhaustive analysis of this information in the hope of gaining some small measure of insight into the internal basis of the subject's unusual ESP ability. Such detailed studies of unusual performers may provide valuable navigational reference points for research and hopefully remedy the scarcity of such information in the existing parapsychological literature.

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