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Pratt JG, Rhine JB, Smith BM, Stuart CE, Greenwood JA (1940). Extra-sensory perception after sixty years: a critical appraisal of the research in extra-sensory perception. New York: Henry Holt.

Title pages

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with
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Extra-Sensory Perception

After Sixty Years

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EXTRA-SENSORY PERCEPTION AFTER SIXTY YEARS

A CRITICAL APPRAISAL OF THE RESEARCH IN EXTRA-SENSORY PERCEPTION

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HENRY HOLT AND COMPANY

Key passages

EXTRA-SENSORY PERCEPTION

After Sixty Years

by

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Reputable experimenters and investigators have been trying for six decades to find out whether or not the human mind can learn anything of the external world through any channels except those of the known senses. Their researches on this vital point have recently come into the spotlight, and the subject of extra-sensory perception — ESP as it is commonly known now—is one of the most exciting controversies of modern scientific thought.

When Professor J. B. Rhine of Duke University published his *New Frontiers of the Mind* in 1937, bringing forward much evidence to support his thesis that ESP was a fact, a critical uproar, pro and con, immediately commenced. Three years later it is not much abated, and this volume, prepared by Dr. Rhine and his associates at Duke University, is less an attempt to refute the critics of the ESP hypothesis than to summarize the evidence so far, and collect it into a single source-book where it can be studied and appraised as a whole. The inclusion of a chapter which contains the adverse criticisms of the psychologists who differ with the Duke experiments testifies to the authors' desire to present a fair and broad picture of the scientific status of ESP today.

But this volume does more than present a summary of a controversy. Later chapters discuss everything that is so far known of the ESP faculty, assuming that it exists. They relate it to human psychology as a whole and describe its relation to other physical and mental processes so far as it is possible to do so. The chapter on test conditions and their effect upon a subject's exercise of extra-sensory powers is especially important and this portion of the book presents the first comprehensive picture of the nature of ESP as a human attribute.

The authors go on to discuss the unsolved problems in ESP research, the latest advances in experimental methods, the mathematical aspects of evaluating test results, and many other points around which scientific dispute has raged for the past three years. Complete with appendices, glossary, and index, this book is the first to give the interested and informed reader a thorough report on the whole field of research into the unknown powers of the mind. It should clear up a number of common misconceptions and presents a report of basic importance on a subject too little understood and studied.

CONTENTS

The comparison of the statistics of more than one experiment suggests a counterpart: the combination of them for an estimate of total significance.

When it is desired to find the significance of several series as a whole and irrespective of the individual values, it is correct (providing the individual trials all have the same probability of success) and probably easiest simply to pool the data and compute the C.R. for the total. Bubb has given an equivalent method which combines the individual C.R.'s properly weighted with the number of trials in each.

It is possible also to obtain the new theoretical mean and S.D. for the total when these parameters, as well as the number of trials or samples, differ among the several series. But probably the most inclusive method is the chi square method given by R. A. Fisher (81: p. 97) which combines the probabilities of the separate series, thus preserving their individual significance. This places no restriction on the individual series, such as necessitating equal probabilities per trial, etc. Fisher's method is illustrated in Appendix 12.

* One can make a useful generalization of the above interpretation as follows: Suppose r series out of n can be selected, each having a probability $\leqq p$. Then we require the probability that r or more such series would be obtained in n chance series. The result is evidently

$$P = \sum_{i=r}^{n} \binom{n}{i} p^i q^{n-i} = 1 - \sum_{j=0}^{r-1} \binom{n}{j} p^j q^{n-j}.$$

For small r, this is not difficult to sum. Illustration: Of 8 completed experiments, 3 yielded probabilities .007, .01, .001. How probable is this? $n = 8$, $r = 3$, $p = .01$. Substituting, $P = 1 - (.99)^8 - \binom{8}{1} (.01)\,(.99)^7 - \binom{8}{2} (.01)^2\,(.99)^6 = .000{,}07$. (Again, this has a strict probability interpretation only if the $p = .01$ were pre-selected.)

RESULTS FOR VARIOUS p-VALUES (i.e., probability of success per trial)*

		A: 1880–1933 incl.				B: 1934–1939 incl.				C: Total (1880–1939 incl.)			
	p =	Repts.	Trials	Dev.	C.R.	Repts.	Trials	Dev.	C.R.	Repts.	Trials	Dev.	C.R.
1	1/2	18	47,140	+765	+7.06	1	125,000	+160	+0.90	19	172,140	+925	+4.45
2	1/3	1	324	+49	+5.77					1	324	+49	+5.77
3	1/4	31	73,154	+1,723	+14.72	2	53,184	+66	+0.66	33	126,338	+1,789	+11.61
4	1/5	1	500	+12	+1.34	44	2,757,854	+52,720	+79.36	45	2,758,354	+52,732	+79.37
5	1/6	5	67,489	+1,242	+12.82	1	52,440	+202	+2.37	6	119,929	+1,444	+11.17
6	1/9	1	41	+3	+1.49	0	0	0	0	1	41	+3	+1.48
7	1/10	10	31,208	+493	+9.30	1	2,870	+84	+5.22	11	34,078	+577	+10.41
8	1/13	18	27,873	+525	+11.82	1	25,000	0	0	19	52,873	+525	+8.57
9	1/16	1	143	+44	+15.22					1	143	+44	+15.22
10	1/20	3	41	+9	+6.47					3	41	+9	+6.47
11	1/25	1	35	+9	+7.75					1	35	+9	+7.75
12	1/26	2	40	+12	+9.91					2	40	+12	+9.91
13	1/29	0	0	0	0	1	134	+21	+9.95	1	134	+21	+9.95
14	1/32	1	59	+2	+1.50					1	59	+2	+1.50
15	1/36	1	612	+8	+1.97					1	612	+8	+1.97
16	1/40	4	11,240 †	+52	+1.22					4	11,240	+52	+1.22
17	1/48	1	187	+56.1	+28.61					1	187	+56.1	+28.61
18	1/52	26	47,890	+877	+29.18	1	25,000	+7	+0.32	27	72,890	+884	+23.94
19	1/81	3	2,402	+199	+36.71					3	2,402	+199	+36.71
20	1/90	3	3,259	+364	+60.86					3	3,259	+364	+60.86
21	1/100	1	56	0	0					1	56	0	0
		χ^2 = 7,881.5 (40 d.f.)				χ^2 = 6,569.0 (16 d.f.)				χ^2 = 13,955.4 (42 d.f.)			

* Radio broadcast results not included.
† 8,368 trials omitted for lack of statement of results.

HYPOTHESES DEALING WITH "SELECTION"

6. *There has been sufficient naive "selection" of data, that is, improper sampling (for example, low scores omitted from the totals without recognition of the error of this procedure), to account for the extra-chance results.* In a few of the earlier reports (during the first twenty years, 1880–1899, of the period under review) the authors did not appreciate the necessity of reporting all of the results obtained. In these instances, it was stated that certain series had not been successful and were omitted from the report. It was clear that no statistical analysis was intended and the fault was, of course, much less serious on that account. No such omissions of unfavorable results, however, is discoverable in the later work in which statistical treatment is given the data in the reports. In fact, a number of reports, combining the better experimental conditions, state that all of the data obtained under the conditions described are given in the report.* These alone are sufficient to render the hypothesis inadequate. However, even where such a statement is omitted and any statistical evaluation is offered, it is presumable that this elementary precaution is observed.

or done as a deliberate act of bad faith, both cases fall under the heading of hypotheses to be considered below.

It is instructive also to consider how many trials yielding only chance averages could have been rejected without altering the conclusions of the research reported. How many could be scored off as "lost, strayed, or stolen" without destroying the significance of the totals? The figures given in answer to this question in Table 12 indicate that larger numbers (at chance average) would have had to be omitted

than can well be considered possible. Even at the rapid rate

TABLE 12

APPROXIMATE NUMBER OF TRIALS AT CHANCE AVERAGE NECESSARY TO LOWER C.R. TO 2.5 *

Results	*Conditions*	*Trials Reported*	*C.R.*	*Additional Chance Trials Required to Reduce C.R. to 2.5*
Table 5	Item 4, Section C.	2,758,354	79.37	2,800,000,000
Table 7	Results (1934–39) excluding sensory cues	907,030	39.90	170,000,000
Table 8	Safeguards in recording plus excl. of sensory cues	468,630	34.38	88,000,000
Table 9	Independent recording, sensory cues excluded	220,455	8.34	2,200,000
Table 10	2 Experimenters, ind. rec., sensory cues excluded	72,750	7.81	630,000
Table 11	2 Experimenters, etc. Woodruff-Pratt	60,000	4.99	180,000

* Only results of tests with $p = \frac{1}{4}$ are pooled because of the impossibility of computing this value with miscellaneous values of p.

of ESP research of the last six years, there would be required 6,000 years to do so many trials at a chance average as would dilute the critical ratio to a point below 2.5.