

A SURVEY OF ELITE SCIENTISTS: THEIR ATTITUDES TOWARD ESP AND PARAPSYCHOLOGY

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ABSTRACT: A questionnaire was mailed to 497 Council members and selected section committee members of the American Association for the Advancement of Science. The questionnaire polled these scientists regarding their attitudes toward ESP, parapsychology, and anomalous experience. These results should be especially important to parapsychologists in that this population consists of individuals who are an "administrative" elite within science and who determine the legitimacy of emerging fields of inquiry. The survey achieved a 71% rate of response, with results that showed this population of elite scientists to have the highest level of skepticism regarding ESP of any major group surveyed within the last twenty years. "Personal experience" was found to be a far more important factor related to belief in ESP than "familiarity with psi research." Those who doubt the existence of ESP tend to cite a priori reasons. These scientists report a lower level of anomalous experience (and belief in ESP) than does the general American population. All in all, the pattern of survey data fits the theoretical orientations presented by MacKenzie and MacKenzie (1980) and McClenon (1981).

A questionnaire regarding opinion of ESP, parapsychology, and anomalous experience was mailed to Council members and selected section committee representatives of the American Association for the Advancement of Science (AAAS). The questionnaire was designed with the plan of comparing responses of the "elite" AAAS members to studies that have been conducted with other populations in the past. These members are "elite" in that they are in positions of leadership and consequently constitute an aspect of the "administrative" elite of the AAAS. Such individuals are especially important in the formulation of policy regarding border and deviant realms of inquiry.

Major findings of this study are that:

1. Although recent studies hint that belief in ESP may be increasing among the general population and among the scientific community, the elite scientific group polled by this study demonstrated the highest level of skepticism of any major group surveyed within the last twenty years.

2. Some sections within the AAAS demonstrate greater degrees of skepticism than others. Elite pharmacists and engineers have a greater tendency to be believers. Anthropologists and those in the History and Philosophy of Science section tend toward skepticism.

3. Belief in ESP is not strongly correlated with age within this elite scientific group. Even among the youngest quartile, only 39% can be considered "believers" in ESP.

4. Among this elite group, believers in ESP tend to cite personal experience as grounds for their belief. Skeptics tend to cite a priori reasons as grounds for disbelief.

5. Familiarity with psi research (as reported by the respondent) is faintly correlated with skepticism regarding ESP.

6. The elite scientists who responded to this questionnaire report a far lower level of anomalous experience than has been reported by the general American population (McCready & Greeley, 1976). The present study found that reporting of such experiences is highly correlated to belief in ESP.

7. This elite group of scientists tends to explain the resistance of scientists to the work of parapsychologists in a completely different manner than the arguments chosen by members of the Parapsychological Association (Allison, 1973). Choice of arguments explaining this resistance tends to be correlated with belief in ESP.

THEORETICAL ORIENTATION

A description of the characteristics of elite members who govern a group can contribute to an understanding of the social processes operating within that group. The scientific elite is created by a series of processes in which professional recognition is distributed in an unequal fashion. There can be no doubt concerning the unequal distribution of scientific rewards, prestige, and consequently administrative control within science:

At all levels of scientific recognition, from the Nobel Prize down to the routine citing of research findings, the same marked separation of a small elite from the great majority of scientists is apparent. (Mulkay, 1976, p. 449)

Although scientific elitism is a complex multidimensional phenomenon (Amick, 1974), elite scientists tend to have certain attributes. They tend to be significantly older than non-elite scientists, to have come from a small number of elite centers (for example, Harvard, Columbia, Berkeley, Princeton, Oxford, Cambridge), and to have

made at least a respectable and usually a major contribution to scientific knowledge (Mulkey, 1976).

Although the intellectual elite and the administrative elite within science are not synonymous, the processes of selection associated with these groups tend to make them overlap. Membership within the administrative elite is considered "a form of service to the profession of a presumably scientifically useful nature" (Amick, 1974, p. 2) and allows considerable control over the systems of communication within science, over the allocation of funds, and over the selection of future elites.

There is speculation among sociologists concerning the size of the administrative elite within science. Wood (1964) estimates that, for federal issues, between 200 and 1,000 individuals directly influence the availability of scientific knowledge and its application. Rosenthal refers to a core group of 900 and an active elite of around 400. Mullins views these numbers to be too small and considers the scientific elite to be at least 1,500 (Gilpin & Wright, 1964; Greenberg, 1969). It would seem that the nature of the particular issue involved would determine the size of the scientific elite that would exercise authority regarding that issue. The size of the scientific elite that is instrumental in determining the status of the field of parapsychology might be of interest to the members of the Parapsychological Association. Although this value is unknown, it has been arbitrarily set at 500 (for the purpose of this study) and the field of inquiry has been restricted to the AAAS. The AAAS is generally accepted as the most prestigious association of scientists in America.

Elite scientists act as a form of buffer between science and the general society. In performing this role they continuously define the nature and meaning of science and consequently tend to be those who have demonstrated the highest commitment to an ethos that might be considered as central to science (Mulkey, 1976, p. 462). This ethos is derived from a priori assumptions underlying the development of science since the seventeenth century (MacKenzie & MacKenzie, 1980). One aspect of this ethos (zietgeist, ideology, world view, etc.) is the labeling of some realms of inquiry as deviant (McClenon, 1981). Inasmuch as parapsychology is part of a tradition that covertly opposes this scientific world view (MacKenzie & MacKenzie, 1980), it might be predicted that elite scientists would reject the field of parapsychology and the ideas it presents to a greater degree than does the average scientist or citizen.

METHODOLOGY

The Pretest Process

A lengthy questionnaire was designed for use in interviewing scientists and was used as a means for developing the final mail-out questionnaire. The interview questionnaire was administered in person to over 35 professors at the University of Maryland. No attempt at a random selection of interviewees was made. Physicists, chemists, biologists, psychologists, and anthropologists were interviewed. The patterns of response regarding opinion of ESP were similar to those found by Wagner and Monnet (1979) in their random sample of college professors. In addition, I saw the following features:

1. Some professors became anxious when they realized that the questionnaire involved parapsychology. Thinking of this field seemed to create an un verbalized tension in them.

2. The subject matter was not one to which the average professor had given much thought.

3. Some skeptical scientists regarded the questions as biased in favor of belief.

4. Individuals who firmly believed in, and also those who were extremely skeptical of, claims of the paranormal seemed to enjoy being interviewed.

A final questionnaire was devised that contained the following items (see Appendix for a full listing of questions):

1. Questions used by Wagner and Monnet (1979) regarding sex, field, age, and attitudes toward ESP and parapsychology. These questions had been administered to a random sample of college professors (Items 1-6).

2. An open-ended request for additional comments concerning attitude toward parapsychology (Item 7).

3. Items measuring self-defined familiarity with parapsychological research and attitudes toward science (Items 8-10).

4. Questions regarding the frequency of anomalous experience were taken from McCready and Greeley's (1976) study in which they polled a random sample of the American population (Items 11-15).

5. An open-ended request for a description of any paranormal or psychic experience that the respondent might have had (Item 16).

6. Questions regarding the resistance of scientists to the work of parapsychologists were taken from Allison's (1973) study in which he polled the Parapsychological Association. An additional argument

and an open-ended question was added to Allison's list as a result of the pretest process (Item 17).

Although Palmer (1979) has devised a better scale for measuring paranormal experience, the McCready and Greeley (1976) scale has the advantage of brevity and of having been administered to a random sample of the entire American population. Although this scale is not particularly valid in measuring *psi* experience, it can be said to test some aspects of *anomalous* experience. Item 11 (concerning *déjà vu*) was modified slightly to improve grammatical clarity.

The reasons for resistance listed in Item 17 might be considered unsophisticated. All in all, the choice of questions was largely dictated by the need for comparability with prior studies and therefore, to a degree, reflects popular misconceptions about parapsychology. A more sophisticated study concerning conflicting beliefs regarding ESP evidence can be found in McConnell (1977).

Mailing Out of Questionnaire

A population of individuals was derived from members of the Council and selected section committees within the American Association for the Advancement of Science.¹ The AAAS is governed by a council and is organized into various sections (the Parapsychological Association is in Section X, the General Section). Each section contains representatives from its member organizations (the representative from the Parapsychological Association is presently Dr. K. Ramakrishna Rao). The criteria for selection of sections were that (1) sections must have a degree of involvement with the subject matter associated with parapsychology or must at least have the potential for future involvement; and (2) a manageable population (less than 500 individuals) was required. The selection of sections was necessarily somewhat arbitrary. Table 4 (pp. 140–141) supplies a list of sections that were selected. Examples of sections which were not selected (but which may or may not have been appropriate) are the Mathematics Section and the Agriculture Section. All members of the Council and of the section committees that were selected were mailed questionnaires.

These individuals are elite in that they have been chosen to

¹This study was conducted under the auspices of the Department of Sociology of the University of Maryland. It was not supported, authorized, or endorsed by the AAAS.

represent the AAAS membership. The Council members' decisions are binding on the entire organization. These individuals, who can be considered to have an attribute that qualifies them as members of an "administrative elite" within science, seem especially appropriate for inclusion in a population of individuals who have power to grant or deny status to the field of parapsychology. By virtue of their position, these scientists have gained a degree of "public visibility" that indicates their elite position and increases their ability to determine the status of emerging realms of inquiry.

The questionnaire (see Appendix) was mailed out on January 9, 1981. Each individual received a cover letter on University of Maryland letterhead stationery, a questionnaire, an addressed and stamped return envelope, and an addressed and stamped post card which would signify that the anonymous questionnaire had been returned. The individual's address was obtained from the *Handbook of the AAAS*. Scientists who were listed more than once among the Council and section committees that were selected were included within the group with which their name first appeared. The respondent could check a block on the post card indicating that he or she wished to be mailed a preliminary report on the questionnaire results. Reminder post cards were sent out on January 20, 1981, and on January 29, 1981. A replacement questionnaire, with a revised cover letter, was sent out on February 20, 1981, to those who had not mailed back a post card.

Method of Analysis

Generally, analysis was conducted through comparison of column percentages across rows. Pearson product correlations were calculated (using the 1108 Univac computer at the University of Maryland) in order to supply a measure of strength of relationship between variables. This statistic was always calculated using "uncollapsed" data, i.e., data that were not grouped into the categories shown in each table.

Because the group of 497 scientists to which the questionnaire was mailed constitutes the test population, tests of statistical significance are inappropriate. Tests of statistical significance reveal the probability of a result's being due to sampling error. Random sampling was not an aspect of this study. Since the computer supplies information regarding statistical significance without extra effort, it has been furnished on some tables. Generally, the strength of a relationship in which the Pearson product correlation (r) is greater than .3 has been deemed "strong." Relationships with r 's between .2 and .3 might be considered "moderate," and r 's between .1 and .2 might be termed "weak." An r of .1, calculated with an N size of 300, demonstrates

statistical significance at the .05 level but should not be considered particularly meaningful.

If we classify as "believers" those who feel that ESP is "an established fact" or "likely possibility" and classify as "skeptics" those who feel that ESP is "merely an unknown," "a remote possibility," or "an impossibility," observation of attitudes towards ESP is simplified. This is the same classification system used by Wagner and Monnet (1979).

This system of classification will be used throughout the present study and might be considered improper by some proponents of psi. They might be alarmed by use of the term "believer" since they feel an evaluation of evidence does not require "belief" in psi and that "belief" is a term unsuitable for use by scientists. From the outset, it should be recognized that use of the term "believer" is not meant in a negative sense but merely as a definition of convenience for a collection of individuals who have responded to the ESP opinion question in a particular manner. A similar dilemma exists with the term "skeptic." A true skeptic (for example, Truzzi, 1980) suspends judgment concerning all questions and, consequently, cannot deem any phenomenon as impossible. The use of the label "skeptic" as a term categorizing this collection of individuals is merely a descriptive convenience. The reader is requested to ignore the philosophical problems that are involved. The use of the terms "skeptic" and "believer" allows a labeling of these groups and a means of quickly noting the differences (or lack of differences) between the individuals falling into these categories.

RESULTS

This survey achieved a 71% rate of response based on the questionnaires that were mailed out. Five of the 497 questionnaires that had been mailed were returned either because the potential respondent had moved and left no forwarding address or was deceased. Questionnaires were returned by 353 individuals, thus yielding a response rate for possible responders of 72%. In reality, some of these "responders" supplied little or no information regarding themselves or their opinions. If "response" is defined as making a choice on Item 4 (the "opinion of extrasensory perception" question), then 339 individuals are in this category. This indicates a 69% response rate for possible responders (and 68% of questionnaires mailed out). This should be considered a high rate of return for this type of mail survey. The results of the survey will be described under eight subtopics.

1. *Evidence testing the validity of Wagner and Monnet's (1979) survey of American college professors*

One valuable means of analysis involves the comparison of the results of this questionnaire with the results of similarly worded questionnaires. The possibility exists that these studies suffer from bias due to non-response. The methodology used in this present study sheds light on the probability that this form of bias intrudes into these types of questionnaires. If believers in ESP have a tendency to respond to these types of questionnaires, a greater percentage of them should be in the group of original responders. A lesser percentage should be among those who required the stimulation of reminder post cards. Even fewer should have required a replacement questionnaire before their response was obtained. If there is a tendency for believers to respond more quickly, this should be reflected by a difference in belief in ESP among these three groups. If such a difference occurred, it would throw doubt on Wagner and Monnet's (1979) contention that their results truly reflect their sampled population since their survey collected only the response of those stimulated by a "one shot" questionnaire.

The data indicate that there are no tendencies for later responders to have less belief in ESP: $r(339) = -.02$. Of those who responded before January 22, 1981, 28% could be classified as believers. A larger percentage of believers (33%) responded between January 22 and February 23; and after February 23, 32% of those who responded were believers. This result suggests that bias due to non-response is not a problem in either Wagner and Monnet's (1979) or this present study.

2. *A comparison of attitudes toward ESP and parapsychology among the various previous studies and this study*

Warner and Clark (1938) and Warner (1952) polled members of the American Psychological Association to determine their attitudes towards ESP and parapsychology. Warner and Clark (1938) received 352 replies out of 603 questionnaires sent out (58%). Warner (1958) received 349 replies from 515 sent out (68%). In both cases, those considering ESP an established fact or a likely possibility constituted a small percentage of the sample (8% and 17%, respectively). ESP was considered a remote possibility or an impossibility by 50% and 49%, respectively.

The most extensive survey of attitudes toward parapsychology to

date was conducted among the readers of the English journal *New Scientist* (Evans, 1973). From the 71,000 copies of the journal that were sold, 1,416 replies were received. A surprisingly high level of belief was expressed, with 67% responding that ESP was either an established fact or a likely possibility.

Various other studies reveal aspects concerning belief in ESP. Moss and Butler (Note 1) are reported by Wagner and Monnet (1979) to have surveyed their psychology colleagues ($N = 37$) and their students ($N = 80$). The professors were found to be significantly more skeptical. A reverse relationship concerning education and belief was found by a Gallup Poll (June 15, 1968) in which 51% of 1,553 adults stated belief in ESP. A greater percentage (two-thirds) of those with college backgrounds believed in ESP.

Wagner and Monnet's (1979) study (conducted in 1973) is the most methodologically comprehensive to date. A random sample of college professors was selected from 120 colleges and universities that also were selected at random from the 1968–1969 Cass and Birnbaum *Comparative Guide to American Colleges*. The only requirement for inclusion in the sample was that the institution must have at least 1,000 students and more than 100 faculty. The questionnaire was similar to those used by Warner and Clark (1938), Warner (1952), and Evans (1973). Wagner and Monnet's (1979) results indicated a favorable attitude toward ESP similar to that found by Evans (1973) and in 1978 by Gallup (1979). Wagner and Monnet (1979) found that 66% of their sample of college professors were favorably disposed to ESP and only 23% considered ESP a remote possibility or an impossibility.

The present study finds a remarkable difference in opinion when compared to previous, recent studies (see Table 1). Only 29% are favorably disposed (consider ESP an established fact or a likely possibility) while 50% consider it a remote possibility or an impossibility. It seems certain that this population of elite scientists is far more skeptical concerning the existence of ESP than the average college professor or the average responder to the *New Scientist* poll.

A comparison of the percentage who consider the investigation of ESP a legitimate scientific undertaking reveals a similar trend (see Table 2). Only 69% of the responding elite AAAS members consider this type of inquiry a legitimate scientific undertaking while 14% would deny its legitimacy. This percentage of individuals denying the legitimacy of the investigation of ESP is greater than has been found in any major study. Certainly an irony exists in the fact that such a large number of elite individuals within science oppose the scientific investigation of a question considered valid and real by a majority of college professors.

TABLE 1
A COMPARISON OF ATTITUDES TOWARD ESP IN THE LITERATURE

In your opinion ESP is:	Warner & Clark (1938)	Warner (1952)	Evans (1973)	Wagner & Monnet (1979)	This Survey of Elite Scientists (1981)
An established fact	1%	3%	25%	16.3%	3.8%
A likely possibility	7	14	42	49.3	25.4
Merely an unknown	40	34	12	10.9	21.2
A remote possibility	36	39	19	19.4	41.0
An impossibility	14	10	3	4.1	8.6

TABLE 2
RESPONSES TO THE QUESTION: "DO YOU CONSIDER THE INVESTIGATION OF ESP A LEGITIMATE SCIENTIFIC UNDERTAKING?"

Response	Warner & Clark (1938)	Warner (1952)	Evans (1973)	Wagner & Monnet (1979)	This Survey of Elite Scientists (1981)
Yes	89%	89%	85%	84%	69%
No	10	9	8	14

A comparison of the natural and social scientists within Wagner and Monnet's (1979) study with those who responded in this present study also reveals major differences in attitudes toward ESP (see Table 3). Although slight differences exist between natural and social scientists—for example, 28% and 20%, respectively, feel ESP is a remote possibility in Wagner and Monnet's (1979) sample—major skepticism is evident in the elite AAAS group (39% and 49%, respectively, feel ESP is a remote possibility). Elite scientists differ in

opinion not only from the typical college professor but also from the typical scientist teaching at a college.

3. The relationship between section of the AAAS and belief in ESP

Wagner and Monnet (1979) note that psychologists have apparently become less neutral and more hostile during the last quarter-century. Among the elite psychologists, only 5% are believers, whereas 32% of those within the social and economic group have that attitude (see Table 4). This finding therefore replicates Wagner and Monnet's (1979) finding of a major difference in belief between psychologists and other social scientists. Of the psychologists in the Wagner and Monnet sample, 34% were believers. Of all the social scientists in their sample, 56% were believers.

The theoretical orientation described earlier in this paper would predict that Council members, being of higher status, might harbor more skepticism regarding ESP than other elite scientists. This prediction was vaguely supported in that only 16% of these members were believers. Other sections demonstrating low percentages of belief were Anthropology (0%), History and Philosophy of Science (0%), and Psychology (5%). Sections demonstrating high percentages of belief were Pharmaceutical Sciences (60%), Engineering (40%), and the General Section (42%). (See Table 4.)

These data are particularly significant in that a movement was initiated (Wheeler, 1979) that sought to disaffiliate the Parapsychological Association from the AAAS. These data indicate that such a movement would, at present, be doomed to failure. Present AAAS "Procedures for Termination of Affiliation: Related By-Law Amendments" require that two-thirds of the Section Committee members of the AAAS section in which the organization in question is enrolled and two-thirds of the Council members vote for termination of affiliation before disaffiliation can occur. Since the Parapsychological Association is affiliated with the General Section, this termination of affiliation at present seems virtually impossible.

4. Differences in sources of belief in ESP between previous studies and this study

This study contained a question regarding the sources of the respondent's opinion regarding ESP which was used by three previous studies (Wagner & Monnet, 1979; Warner, 1952; Warner & Clark,

TABLE 3
RELATION BETWEEN ACADEMIC FIELD OF SCIENTIST AND ATTITUDE TOWARD ESP

In your opinion ESP is:	Natural Science College Professors (Wagner & Monnet, 1979)	Elite Natural Scientists ^a (This Study, 1981)	Social Science College Professors (Wagner & Monnet, 1979)	Elite Social Scientists ^a (This Study, 1981)
	<i>N</i> = 294	<i>N</i> = 119	<i>N</i> = 239	<i>N</i> = 61
An established fact	10%	3%	10%	7%
A likely possibility	46	27	47	13
Merely an unknown	15	19	13	25
A remote possibility	28	39	20	49
An impossibility	3	12	11	7
	100%	100%	100%	100%

Note. Because the figures in the columns have been rounded off to the nearest percentage point, they do not always add up to 100%. This practice has been used in the presentation of all information regarding percentages.

^aPhysicists, chemists, and biologists were considered natural scientists. Psychologists, sociologists, economists, philosophers, and anthropologists were considered social scientists.

1938). Respondents could check which sources they used in developing an opinion regarding ESP. A comparison between the various previous studies indicates the differences between source of belief or rejection of ESP. The elite scientists cited newspapers as a source of opinion more frequently than any other group that has been polled. Of these scientists, 67% cited this source of opinion (54% of Wagner and Monnet's sample of college professors cited this source). The elite group also cited a priori reasons and personal experience (25% and 28%, respectively) more frequently than did the college professors (18% and 11%, respectively). Of the skeptical psychologists (Warner, 1952) who were polled most recently, 32% cited a priori reasons as a source of belief. Personal experience was cited by only 8% of this group. One source of opinion, television, drew a response from 15% of the elite scientists. Books by Rhine or other parapsychologists were cited by 22%; 30% cited journal reports; and 14% cited hearsay as a source of opinion concerning ESP.

5. The relation of various factors in belief or disbelief in ESP

Belief in ESP is strongly and positively correlated to the acceptance of the investigation of ESP as a legitimate scientific undertaking. Although numerous scientists exclaimed (both during the pretest and by writing comments on their questionnaires) that these two opinions should not be related, the evidence indicates that they are (see Table 5). Theoretically, it would be possible to conduct a valid scientific investigation of ESP without the phenomena being "real." It might be supposed that such an investigation would reveal this "unreality" to the investigator. Even though this is the case, the evidence generated by this questionnaire indicates that opinion regarding ESP is highly correlated to opinion regarding the legitimacy of its investigation: $r(334) = .37$.

Wagner and Monnet (1979) noted that "attempts to relate age, sex, or month of birth to attitudes toward ESP were unsuccessful. . . ." This present study finds no strong relationship between age and attitude toward ESP although a weak relationship does exist: $r(332) = -.16$. Younger elite scientists have a slight tendency to be more accepting of the probability of the phenomena. Although this is the case, anyone who hopes that the death of the most elderly elite scientists will herald a scientific revolution in which ESP becomes an accepted anomaly will most probably be disappointed. Of scientists born during 1928 and after, only 39% can be considered believers. Of those who were born during 1919 or before 1928 (31%), only 19% are believers. Of those who were born during 1918 or before, 25% are believers.

TABLE 4
ATTITUDE TOWARD ESP AND PARAPSYCHOLOGY BY MEMBERS OF AAAS SECTIONS

Section	Number of Questionnaires Mailed	Number Responding ^a	Percentage Responding	Percentage "Believers"	Percentage Denying Legitimacy to ESP Investigation (N = 338)
Council Members	86	43	50%	16%	11%
Section B Physics	22	11	50	18	25
Section C Chemistry	23	18	78	33	38
Section G Biological Sciences	66	53	80	34	11
Section H Anthropology	14	8	57	0	43
Section J Psychology	29	21	72	5	5
Section K Social and Economic Sciences	29	19	66	32	5
Section L History and Philosophy of Science	15	9	60	0	0

Section M Engineering	37	30	81	40	20
Section N Medical Sciences	47	29	62	28	10
Section S Pharmaceutical Sciences	8	5	62	60	0
Section T Information, Computing and Communication	34	24	70	38	4
Section U Statistics	15	11	73	18	8
Section X General	72	55	76	42	15
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Total	497	336	68%	29%	14%
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*This number represents those who allowed the use of their section name and who responded to Item 4 of the questionnaire.

TABLE 5
RELATIONSHIP BETWEEN BELIEF IN ESP AND BELIEF THAT THE INVESTIGATION
OF ESP IS LEGITIMATE

In your opinion ESP is:	Do you consider the investigation of ESP a legitimate scientific undertaking?		
	Yes	Not Sure	No
An established fact	12 (5%)	1 (2%)	0 (0%)
A likely possibility	75 (33%)	10 (17%)	1 (2%)
Merely an unknown	44 (19%)	19 (32%)	7 (16%)
A remote possibility	92 (40%)	26 (44%)	18 (40%)
An impossibility	7 (3%)	3 (5%)	19 (42%)
	230 (100%)	59 (100%)	45 (100%)

$r(334) = .37; p < .001^a$

^aThe reader should be reminded of the caveat concerning tests of significance mentioned on page 132.

Believers had a tendency to cite different sources of opinion regarding ESP than did skeptics. They constituted 30% of those who cited newspapers, 25% of those citing books by Rhine, etc., 23% of those citing journals, 47% of those citing TV, 33% of those citing hearsay, 7% of those citing a priori reasons, and 54% of those citing personal experience. This would indicate that belief is related to personal experience and TV, while skepticism is most related to a priori reasoning and reading scientific journals and books by parapsychologists.

This study replicates Wagner and Monnet's (1979) finding that modern scientists are apparently less familiar with books and journal articles concerning parapsychology than psychologists were in 1938 and 1952. This is demonstrated by the fact that these sources of opinion were cited far less frequently by the elite scientists than by previously polled psychologists.

Comments written by the respondents in the various open-ended sections of the questionnaire reveal the impact that parapsychological

literature has had on this elite group. J. B. Rhine is mentioned 14 times. In 13 cases, he is mentioned by a skeptic (often in a negative context). Puthoff and Targ are the only living parapsychologists mentioned by a respondent. They are referred to once by a skeptic in a negative context. Only 9 of the 351 responding scientists cited a parapsychological journal as a source of information regarding the field (5 were believers, 4 were skeptics). It would seem that reports of modern parapsychological research are not reaching this elite group and that past research has not had a particularly favorable impact.

To the question, "How familiar are you with parapsychological research?", the most frequent response was "slightly," with 47% of all respondents choosing this category. Virtually no relationship exists between familiarity with psi research and opinion of ESP: $r(336) = .10$. Those who consider themselves more familiar tend to be more skeptical (yet the two individuals who termed themselves as "very" familiar with psi research were certain of the reality of psi).

Attempts to relate response to items measuring "attitude toward science" (Questions 9 and 10) to "opinion of ESP" were unsuccessful. Response to Questions 9 and 10 was also unrelated to response to "consideration of ESP as a legitimate scientific undertaking" (Question 6).

Analysis of the relationship between frequency of anomalous experience and opinion concerning ESP demonstrates the close relationship between these two factors (see Table 6). Those who report belief in ESP also report a greater frequency of anomalous experience. The experience of clairvoyance is especially related to belief in ESP ($r = .28$). Merely to report any one of the experiences on any occasion is highly correlated with ESP ($r = .33$). This "cumulative experience" scale is also the best predictor of an individual's opinion regarding the legitimacy of ESP research of any item on the questionnaire (disregarding the ESP opinion question itself). Those who have had anomalous experiences are far more likely to grant legitimacy to ESP research; and the more experiences, the greater the probability of granting legitimacy: $r(312) = .27$.

All in all, these findings indicate that opinions regarding parapsychology and ESP are not formed by analysis of the findings of scientific experimentation. Some elite scientists who have not had one of these forms of anomalous experiences consider the paranormality of such experiences to be impossible. Others who have personally had these forms of experience feel that they constitute evidence supporting the possibility of the paranormal.

TABLE 6
 RELATIONSHIP BETWEEN BELIEF IN ESP AND ANOMALOUS EXPERIENCE

Type of Experience	Percentage Who Reported One or More Experiences	Percentage of Believers Who Reported One or More Experiences	Percentage of Skeptics Who Reported One or More Experiences	Pearson Product Correlation Between Belief in ESP and Frequency of Experience ^a
Déjà vu	59%	76%	52%	.23
ESP	26	47	17	.27
Clairvoyance	4	14	.4	.28
Communication with the dead	10	17	7	.17
Out-of-body experience (with spiritual force)	20	33	14	.14
Any of the above experiences	65	90	56	.33

^aAll these values are significant at the .005 level, but see caveat, page 132.

TABLE 7
 PERCENTAGE OF INDIVIDUALS WHO REPORT HAVING HAD A PARTICULAR
 EXPERIENCE ONCE OR MORE

	General Population McCready & Greeley (1976)	Elite Scientists in This Study
Déjà vu	59%	59%
ESP	58	26
Clairvoyance	24	4
Contact with dead	27	10
Out-of-body experience (with spiritual force)	35	20

6. *A comparison of the quantity of anomalous experience within the elite scientific population and within the general American population*

It might be hypothesized that since differences concerning attitude toward ESP within the elite scientific population can be explained by differences in the level of anomalous experience, differences between the elite scientist and general population might follow the same pattern. This is indeed the case; i.e., the elite scientists who responded to the survey have a lower level of anomalous experience than the general American population (see Table 7). Only the experience of déjà vu is reported by an equivalent percentage of these two populations. The most marked difference occurs in the reporting of the ESP experience. Of the elite scientists, 26% reported this experience while 58% of the American population reported it.

7. *Factors related to the respondent's evaluation of reasons explaining the resistance of scientists to parapsychology*

One section of the questionnaire requested the respondent to evaluate the importance of various arguments explaining the resistance of science to the work of parapsychologists. These evaluations were found, in most cases, to be correlated with opinion of ESP. Some aspects of these evaluations reflect the process of labeling parapsychologists as deviant.

A comparison of Allison's (1973) results regarding the Parapsycho-

logical Association members' evaluation of various arguments and the results of this study reveal major differences between the importance assigned to these arguments by the two major groups (see Table 8). While the Parapsychological Association evaluated the arguments "Parapsychology threatens the established mechanistic world view . . ." and "Scientists are simply unfamiliar with the present evidence . . ." as most important, the elite scientific group considers these arguments as least important. The argument considered least important by the parapsychologists ("There is insufficient evidence for psychic ability") is deemed most important by the elite scientists. The argument that parapsychological research is not being conducted competently was considered to be of high importance by numerous elite scientists (this argument was made by numerous professors during the pretest process).

The elite scientists' evaluation of the importance of most of these arguments was found to be correlated to belief in ESP. This seems to reveal the rhetorical dimensions of the controversy regarding psi. Even the consideration of why parapsychological research is neglected by science is a question that is directly related to the respondents' suppositions regarding psi. The evaluation of the validity of parapsychological evidence and of the competence of parapsychological researchers is part of the political and rhetorical process that seems to be an inherent aspect of science.

8. Analysis of open-ended questions

Response to the open-ended questions regarding attitude toward parapsychology can be classified into four categories. The most typical response indicated open-minded skepticism. A second, lesser body of response argued against the legitimacy of the field of parapsychology. A third body of response supported greater research in this field, and a fourth (and smallest) category expressed belief in ESP but also doubt in the value of scientifically exploring the phenomenon.

Forty-two scientists (12% of the entire group that responded) wrote descriptions of experiences that they considered psychic or paranormal. Although only a few of these descriptions could be considered as highly evidential in nature, virtually all of these respondents evaluated ESP as "a likely probability" or "an established fact." These responses support the observation that personal experience is of primary importance in generating belief in ESP. Those who reported paranormal experience also tended to support the legitimacy of ESP research.

TABLE 8
 PERCENTAGE WHO CONSIDER ARGUMENT "VERY IMPORTANT" OR "EXTREMELY IMPORTANT"

	Parapsy- chological Association Members (Allison, 1973)	Present Study Total	Present Study Believers	Present Study Skeptics	Present Study: Corre- lation Be- tween Rating of Argument & Opinion of ESP	<i>N</i> Elite Scientists
a. Parapsychology threatens the established mechanistic world view of scientists.	67%	13%	17%	11%	$r = +.11^a$	302
b. Parapsychology conflicts with current physical or biological theories.	58	36	25	40	$r = -.23^a$	299
c. Scientists want to avoid any association with "occult" phenomena.	57	37	47	33	$r = +.15^a$	302
d. There is insufficient evidence for psychic ability.	14	71	44	80	$r = -.41^a$	305
e. The complexity and elusiveness of psi makes it extremely difficult to research.	44	62	65	62	$r = +.10^a$	289
f. Scientists are simply unfamiliar with the present evidence for psi.	73	18	38	10	$r = +.37^a$	278
g. No adequate theory has been produced to explain psychic ability.	44	57	59	56	.00	293
h. Scientists feel that, on the whole, parapsychological research has not been conducted in a competent manner.		68	60	71	$r = -.12^a$	267

^aSignificant at the .05 level, but see caveat (page 132).

Those who have had no experiences that might be considered as paranormal often belittle the importance of this type of experience. One respondent noted that such experiences may be due to "minor malfunctions of the brain." Mystical experiences are not necessarily paranormal but are "perfectly understandable as matters of imagination" by people who are "misled by wishful thinking, dreams, and illusions" and who are probably "unsophisticated."

CONCLUSION

The population of elite scientists surveyed in this study demonstrated the highest level of skepticism regarding ESP of any major group surveyed within the last twenty years. This doubt in the probability of ESP is positively related to the denial of the legitimacy of the field of parapsychology. In that this population of scientists constitutes an "administrative" elite, these results shed light on the reason parapsychology has failed to gain full legitimacy within the scientific community even though its proponents attempt to adhere to all the norms and canons of science. Within this group of elite scientists, belief in ESP is more related to personal experience than to familiarity with the research literature regarding psi. There is a tendency for those who doubt the existence of ESP to cite a priori reasons for this opinion. The pattern of data tends to support the theoretical orientations presented by MacKenzie and MacKenzie (1980) and McClenon (1981). This orientation views psi research as an aspect of a "parapsychological tradition" that covertly opposes the scientific world view. Elite scientists can be expected to defend this world view more vigorously than nonelite scientists since part of their role as an elite is the definition of the nature of science based on the assumptions that are inherent within science.

APPENDIX

ELITE SCIENTIST QUESTIONNAIRE

1. Sex: _____ Male _____ Female
2. Current academic field _____
3. Birth date: _____ Month _____ Year

Extrasensory perception is defined as experience of, or response to, a target object, state, event, or influence without sensory contact.

Psi is a general term to identify a person's extrasensorimotor communication with the environment. Parapsychology is the branch of science that deals with psi communication, i.e., behavioral or personal exchanges with the environment which are extrasensorimotor—not dependent on the senses and muscles.

4. In your opinion is extrasensory perception:
 - a. An established fact
 - b. A likely possibility
 - c. A remote possibility
 - d. An impossibility
 - e. Merely an unknown
5. Is this opinion based on: (Choose as many as are applicable)
 - a. Reports in newspapers and magazines
 - b. Books by Rhine, Soal, or other parapsychologists
 - c. Experimentation as reported in scientific journals
Which journals?
 - d. Television
 - e. Hearsay
 - f. A priori grounds
 - g. Personal experience
 - h. Other (Summarize briefly)
6. Do you consider the investigation of extrasensory perception a legitimate scientific undertaking?
 - a. Yes
 - b. No
 - c. Not sure
7. Additional comments concerning your attitude toward parapsychology:

8. How familiar are you with parapsychological research?
- Not at all familiar
 - Slightly familiar
 - Somewhat familiar
 - Fairly well familiar
 - Very familiar

How much do you agree or disagree with each of the following statements?

9. It is possible to distinguish science from non-science.
- Strongly disagree
 - Disagree
 - Uncertain
 - Agree
 - Strongly agree
 - I cannot make a judgment
10. Success in science depends not only on rational argument but on a mixture of subterfuge, rhetoric, and propaganda.
- Strongly disagree
 - Disagree
 - Uncertain
 - Agree
 - Strongly agree
 - I cannot make a judgment

How often have you had any of the following experiences? Read each item and circle one code for each. [For each of the Questions 11 through 15, the respondent was asked to circle a number from 1 to 5 indicating one of the following answers: "Never in my life," "Once or twice," "Several times," "Often," "I cannot answer this question."]

11. Thought you were somewhere you had been before but knew it was impossible. (*déjà vu*)
12. Felt as though you were in touch with someone when you knew that it was impossible. (ESP)
13. Seen events that happened at a great distance as they were happening. (*clairvoyance*)
14. Felt as though you were really in touch with someone who died. (*communication with the dead*)

15. Felt as though you were very close to a powerful, spiritual force that seemed to lift you out of yourself. (out-of-body experience)
16. If you have had what might be considered a paranormal or psychic experience, would you describe it briefly.
17. Many reasons have been suggested to explain the resistance of scientists to the work of parapsychologists. Several possible reasons are listed below. Please rate each one according to your opinion of its importance. [To the right of each of the following subtopics *a* through *i*, there were six spaces, labeled as follows: "Extremely important," "Very important," "Somewhat important," "Slightly important," "Not at all important," and "I do not know or cannot answer."]
 - a. Parapsychology threatens the established mechanistic world view of scientists.
 - b. Parapsychology conflicts with current physical or biological theories.
 - c. Scientists want to avoid any association with "occult" phenomena.
 - d. There is insufficient evidence for psychic ability.
 - e. The complexity and elusiveness of psi makes it extremely difficult to research.
 - f. Scientists are simply unfamiliar with the present evidence for psi.
 - g. No adequate theory has been produced to explain psychic ability.
 - h. Scientists feel that, on the whole, parapsychological research has not been conducted in a competent manner.
 - i. Other reasons:

REFERENCE NOTE

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