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Experimental Studies of the Differential Effect in Life Setting

P. Sailaja and K. R. Rao

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To Gertrude R. Schmeidler

Biographical Notes

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Miss Sailaja's work in parapsychology includes the investigation of the differential response in a two-language testing situation. Currently, she is engaged in the study of certain native Indian practices and their relation to parapsychology.

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A psychologist and a philosopher, Dr. Rao has written extensively on topics ranging widely from parapsychology to pragmatism, from the development of the library movement to the problems of education. His publications in parapsychology include numerous experimental and theoretical papers. In addition, he is the author of Psi Cognition (*Tenali: Tagore, 1957*), Experimental Parapsychology (*Springfield, Ill.: Thomas, 1966*), Gandhi and Pragmatism (*Calcutta: Oxford and IBH, 1968*) *and* Mystic Awareness (*University of Mysore, 1972*).

PREFACE

The built-in hazards in ESP research make it difficult to obtain phenomena in the laboratory and what phenomena do appear are of a somewhat unpredictable nature. Not uncommonly, one's rational expectations and logical deductions are belied by the results obtained.

Aware of these possibilities, we have proceeded in this research step by step from the actual leads found in the data. The main focus has been on reducing variability and sustaining the conditions presumed to permit greater consistency in the results. The principal innovation introduced in these studies consists in the administration of ESP tests in a life situation where the subject believes that the ESP score he obtains would have a significant bearing on something of importance to him. Such a testing situation, it is believed, would provide the necessary motivation and the subject involvement that are so characteristic of spontaneous cases.

We are greatly indebted to Dr. B. K. Kanthamani, Lecturer, Department of Psychology and Parapsychology, Andhra University, who acted as a coexperimenter and gave ungrudgingly of her valuable time. In a sense she is the third author of this work. Our thanks are also due to Miss Pramila David who rechecked all data, tables, and computations.

The results of the preliminary experiment have been published previously in the *International Journal of Parapsychology* (Vol. 9, No. 2, 1967). The results of the confirmatory experiments were presented at the Eleventh Annual Convention of the Parapsychological Association, Freiburg, 1968.

This work is based on a thesis by the first author (supervised

by the second author) for the Ph.D. degree from Andhra University. The authors are grateful to Andhra University for granting permission to publish this book.

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P. Sailaja
K. R. Rao

Andhra University, Visakhapatnam, India
February, 1973

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I

INTRODUCTION

ESP TESTING IN LIFE SITUATIONS

"Most of the talk of the last thirty years," wrote R. A. McConnell in 1966,[1] "has been about ESP *in the laboratory*. This is misleading. ESP is primarily a spontaneous phenomenon, and it is only rarely and with great difficulty that we can coax out a little of it in our experiments." (P. 198.)

This significant statement succinctly brings out the limitations under which modern parasychological research is laboring. The employment of quantitative techniques to the investigation of the paranormal and the concern of the parapsychologist to convince his critics have all led progressively to an excessive emphasis on a methodology that left little room for subject spontaneity and created a laboratory situation that is far too removed and different from a life situation. This is of course not to belittle the importance of this phase of parapsychological research represented by the card-calling tests. For one thing, it is mainly due to these card-calling experiments that a convincing demonstration of the various forms of psi is made possible. Also, the large number of correlational studies linking ESP scores of the subjects with personality variables, target variables and variables relating to the experimental conditions have all undoubtedly added something to our understanding of the nature of ESP. And yet today, after nearly a century of exploration and experimentation, we are far from making any claims of control over ESP. The cry for a repeatable ESP experiment is still heard. Moreover, the extrasensorily obtained information in the laboratory situation does not even remotely resemble the richness and variety of the spontaneous psi experiences.

There is a lack of consistency among published reports of ESP research at various levels. First, there is the lack of consistency in obtaining evidence for ESP. While a number of investigators in the field of parapsychology have succeeded in obtaining evidence of the existence of ESP, there are also those people who have unsuccessfully carried out ESP tests and are unwilling to accept the evidence obtained by others. Second, while a number of significant relationships between ESP and personality variables, such as extraversion and introversion (Humphrey, 1951),[2] expansiveness and compressiveness (Humphrey, 1946),[3,4] ego involvement and task orientation (Eilbert and Schmeidler, 1950),[5] impunitiveness and extrapunitiveness (Schmeidler, 1954),[6] spontaneity (Scherer, 1948),[7] adjustment (Shields, 1962),[8] anxiety (Freeman and Nielsen, 1964),[9] and neuroticism (Kanthamani, 1968),[10] have been reported, failures to replicate several of these studies are not uncommon.

More than once, significant relationships in the opposite directions have also been reported. The conflicting results are generally explained in terms of situational variations or differences in testing procedures. Expansives (Humphrey, 1946),[11] for instance, obtained significantly more hits than compressives in clairvoyance tests, and the latter scored significantly more hits than the former in the GESP tests (Humphrey, 1946).[12] This apparent inconsistency is explained by the assumed triangular relationship between the subject's performance, his mood, and the nature of the ESP test administered.

In one study (Rao, 1965),[13] the low-anxious subjects showed a significantly better rate of scoring than the high-anxious, whereas in another (Freeman and Nielsen, 1964),[14] the high-anxious subjects obtained more hits than the low-anxious. Again, it is suggested (Rao, 1966)[15] that there is another variable, viz., the nature of the task, whether it is simple or complex, which may have affected the high- and low-anxious subjects differentially in these two studies.

All this means that there are far too many variables influencing the subject's ESP performance to be adequately dealt with by the experimenter. Therefore, it happens not infrequently that the investigator has to look back after completing the study for the possible factors that had contaminated his results. This is perhaps inevitable at this stage of research. But any attempt to devise a method or tech-

nique that would render many of the unknown and unwanted variables ineffective should be welcomed.

It would not be unreasonable if one hoped to find the reason for the disturbing lack of consistency in the experimental ESP results in the differences that exist between the laboratory and life situations. Consider for example the following case which is in the files of the Department of Psychology and Parapsychology of Andhra University. This case is reported by an elderly gentleman (INR) who is now in his seventies.

This happened in 1931 or thereabouts. I have a friend whom I knew well from 1913 onwards. He is still alive (73 years). I shall refer to him as KP. He has two years certificate in agriculture from Coimbatore College. (Later he took his B.A. degree and teacher's training). One day we saw an advertisement for an agricultural superintendent for a big sewage farm in a big industrial city. The qualifications required were not possessed by my friend. Still, I suggested to my friend to apply for it and he did. To our pleasant surprise, he was asked to appear for an interview by the employer.

A day or two before he was due to entrain for the interview, his mother became seriously ill and I felt it was a serious, even fatal, illness. So when he asked if I advised him to go for the interview I said "your mother may not survive this illness but you should not miss this chance to get a good job. The final decision is yours." He decided to go for the interview. His father was very upset and angry and wanted my friend (who was the eldest son of the family) to cancel his journey but my friend insisted on going. So, I was blamed for the decision!

At the railway platform, a few minutes before the train arrived, I had a sudden "vision" at 9 A.M. in broad daylight. I saw a Board of interviewers, numbering four, and one of them asked my friend: "We have 800 acres farm. Can you manage it?" After a minute or two, recovering my normal mind, I told my friend—the Board will consist of so many persons, described them generally and said "they will ask you if you can manage a farm of 800 acres, etc. You tell them that you can manage only 150 acres to 200 acres single handed; but with a full complement of subordinates, you will give your best service to meet their requirements." My friend naturally laughed it away. But when he met the Board about 50 hours later, he was struck by the number of Board members and how they answered my description of them correctly. So when the identical question was put to him, he readily gave the answer he was tutored to give by me before he entrained. His mother died the evening he left and I was specially the target of much family curses! Four days later, my friend returned and was

terribly impressed by my description of the Board and the questions put by the members to him. About a fortnight later, he got orders giving him the job and he worked there the next 25 years and rose to a fairly high status there. This applicant was preferred to many others of superior academic qualifications because his answer to the question impressed them as a "practical and realistic" approach.

When my friend was entraining, I was obviously in high tension and felt I was taking a big responsibility in asking him to go for the interview when his mother was seriously ill. I knew his family would be furious but I was very hopeful my friend will succeed in getting the job because every time I asked him to apply for a job he invariably got it.

Now when one compares this experience with a highly successful ESP experiment such as the Pearce-Pratt experiment (Rhine and Pratt, 1954),[16] in which the subject was able to guess correctly an average of 7.54 hits per run of 25 trials, when mean chance expectation is 5 hits per run, the many striking differences between spontaneous and laboratory ESP become apparent. The most striking difference between them consists in the richness of information received by INR compared to the extrachance success of a couple of more guesses in each run by Pearce. In fact, all that we can say about the results obtained by Pearce is that they could not have been produced if the subject did not have ESP. It is even difficult to differentiate between successful trials due to ESP and those that could have been merely chance hits.

INR was quite convinced that the vision he had of the interviewing committee was a true one. Compared to this it is difficult to maintain that Pearce had any awareness of his successful trials. As L. E. Rhine (1967)[17] points out, the conviction aspect seems to be a real and integral part of life experiences. In laboratory experiments the subject seldom knows which of his successes are hits and which are misses.

Various attempts have been made to see whether the subjects in ESP tests could identify their successful guesses. In an ESP experiment, Woodruff and George (1937)[18] found that their subjects could not accurately estimate their scores. Warner and Raible (1937)[19] also failed to find any evidence that their subjects could identify their successful responses. According to Soal and Goldney (1943),[20] Shackleton, their star subject, also could not indicate his successful guesses.

There are, however, other studies that indicate that some subjects under some conditions are able to identify their correct responses. Among these are the studies by Hilton Rice (Pratt, 1937),[21] Humphrey and Nicol (1955),[22] Nash, C. B. and Nash, C. S. (1958),[23] Schmeidler (1961),[24] and Fahler and Osis (1966).[25] In the Fahler-Osis (1966) study, the subjects scored higher on the trials where they felt they were correct than on other trials ($p=.00000002$). This highly significant result, while supporting the hypothesis that some subjects may be successful in identifying the successful calls, does not rule out the possibility that such an identification itself may be due to ESP. When asked to say which of his calls are likely to be successful, the subject may simply use his ESP to identify those calls that would match the targets. It is difficult to maintain that the subjects in the laboratory ESP experiments are guided by a feeling of success because they seldom report such feelings.

One might, however, argue that the conviction of the truth in some spontaneous psi experiences also cannot be generally applied to all cases. First, there are some cases where conviction is lacking. Second, it is likely that people are more apt to notice, remember, and report those cases that are associated with strong feelings of conviction rather than those which are experienced without any such conviction.

The most important difference between life and laboratory situations is the one relating to the motivation of the subjects. As L. E. Rhine (1967)[26] points out, "the most obvious difference between the case and the experimental situation is that of the motives and interests involved. In life the subject matter is of direct, often vital, concern to the person; even if it is not a crisis, still it is a real event in real life. As such the individual is personally involved and implicitly interested." (P. 64.)

Most of the experimental studies in parapsychology bear little relevance to the participating subject. Very often the subject is a volunteer. Occasionally he may be paid a small fee. But the main characteristics of spontaneous psi, viz., subject involvement and a perception of the relevance to life of the information sought through ESP, are seldom present in any comparable measure in laboratory experiments. Contrary to this, in life situations the information obtained through ESP has a great deal of relevance to the subject. INR

in the case cited before was able to advise his friend. One could even say, but for INR's psi experience, his friend could not have secured the job.

Therefore, in conducting successful experiments one cannot overemphasize the need for testing the subjects in situations comparable in their motivational involvement to life situations. In fact, this point has been stressed by a number of parapsychologists. Pointing out that exceptionally strong conative states are present in outstanding ESP performances, Rhine (1964)[27] concluded that "exceptionally strong drive is needed for the top-level performance." (P. 48.) Rao (1966),[28] reviewing the experimental studies of the last quarter of the century, singled out motivation and adjustment as the two most outstanding variables that affect the subject's ESP performance.

The importance of motivation as an essential condition for success in ESP tests has been recognized from almost the beginning of serious scientific research in ESP. Rhine (1964)[29] noted that he observed in his early work with Pearce that the latter scored 25 consecutive hits when Rhine "playfully dared him, bet with him, and thereby aroused special effort in him over each card." (P. 106.) Investigators like Woodruff and George (1937),[30] Rhine (1938),[31] Woodruff and Murphy (1943)[32] found that judiciously introduced monetary incentives helped to improve ESP scores. Douglas Steen (1957),[33] Ratte (1960),[34] Ratte and Greene (1960)[35] found that game-like situations which are likely to sustain motivation facilitated psi manifestation. Kanthamani (1966)[36] also used a game-like ESP test along with the social stimulus of competition among her subjects working in pairs, and reported consistent results in three separate experimental series. Rhine (1964)[37] reported that a young woman who did not show any particular success in previous ESP experiments obtained a high score when she was asked to guess a deck of cards before a television camera. Commenting on this, Rhine stressed the possibility of tapping audience stimulation to activate test responsiveness of certain subjects.

It has been pointed out quite often (Soal and Bateman, 1954)[38] that the ESP cards contain meaningless symbols which cannot sustain the subject's interest for very long. Therefore, attempts have been made to use target material that has some live interest to the subject. The variations included family names (Skibinsky, 1950);[39] animal

figures (Soal and Goldney, 1943);[40] erotic symbols (Fisk and West, 1955-1956);[41,42] famous paintings (Ullman and Krippner, 1970);[43] emotionally-toned objects (Freeman, 1961);[44] symbols with favorable emotional associations chosen by the subject (Rao, 1962);[45] and words in foreign languages (Rao, 1963, 1964).[46,47,48] Moss and Gengerelli (1968)[49] made imaginative use of multisensory target material to generate highly charged affective states and obtained interesting results.

While all these studies and others like them have undoubtedly pointed out the importance of generating interest and motivation in the subject for a successful ESP performance, it must be admitted that none of these approach the personal involvement of the subject in a life situation. Again, if there is a way one can induce a high motivational state with a subject's personal and intrinsic involvement comparable to a life situation, then ESP may manifest itself in more dependable ways. The often lamented elusiveness of ESP is perhaps a result of a large number of yet unrecognized, and therefore uncontrolled, variables operating on it. The effect of these variables may be rendered relatively insignificant by raising the motivational level. This may indeed be what happens in life situations.

That ESP occurs in life situations one can be reasonably certain if the spontaneous experiences have any credibility. Yet only a few experimental studies have attempted to link the subject's ESP scores with presumed use of ESP in his life situation. One of these is the experiment of Douglas Dean (1966)[50] with company presidents. This experiment was also replicated by Mihalasky (1968).[51] Dean and Mihalasky found that successful executives who were expected to use ESP in their decision-making scored positively in precognition tests. As Mihalasky reports, "A correlation between precognition scores and profit patterns indicated that all executives who increased their company's profits by more than 100% scored above chance." (P. 152).

In a recent study by Cashen and Ramseyer (1970),[52] it was found that their student-subjects who obtained high scores in a GESP test were able to predict significantly more items in forthcoming examinations than the subjects who made low ESP scores. This finding confirms the hunch that it is possible (a) to obtain information about test items in an examination by means of ESP and

(b) that those who obtain high scores in conventional ESP tests would be the ones who can use ESP to obtain such information. This study is an interesting attempt to build the ESP test into a life situation.

The failure to produce consistent results in relating personality, situational, and other variables with ESP is doubtless due to our failure to control the myriad variables that seem to affect ESP. If we can build the ESP tests into a life situation charged with needs considered important to the subject, then we may expect greater consistency in the ESP results, because the overriding influence of the motivational factors may neutralize the effects of other variables. Speaking about telepathic dreams involving the patient and therapist, Ullman (1970)[53] pointed out that, "Among the important preconditions for the appearance of a telepathic dream was the existence of a genuine need on the part of the patient to reach or to be in touch with the analyst at some level under conditions where ordinary communicative channels are inoperative or where defensive maneuvers make direct contact impossible." (P. 362.)

This observation of Ullman's emphasizes that a genuine need-oriented situation is essential for successful ESP performance. This may also explain why the dramatic exchange of extrasensory information which is so characteristic of ESP in real life situations, is lacking in laboratory experiments.

Therefore, it is not unreasonable to hypothesize that the subject may produce ESP in a more reliable and consistent fashion if the test is woven around a life situation relevant and meaningful to him. The high motivation and personal involvement of the subject may be the crucial factors. But it would be naive to assume that every subject working in such a situation would consistently score in the positive direction because it is not uncommon to also observe psi-missing in life situations. The bidirectionality of psi seems to manifest itself in life as well as in laboratory situations.

The strategy of bringing laboratory situations closer to life situations should involve not only the spontaneity and deep involvement characteristic of the life situation but also an experimental design that has proven fruitful in laboratory testing of ESP and that incorporates many of the successful leads described in the literature of experimental studies of ESP during the last several years. One such

is the differential situation which is found to be highly rewarding in a number of experimental studies. As Rao (1965)[54] has shown, ESP seems to be bidirectional in nature and this may have a great deal to do with its elusiveness. The typical characteristic of bidirectionality is the differential response which shifts from hitting to missing sometimes in predictable manner. The differential response was shown to occur at the target level (Skibinsky, 1950;[55] Hallet, 1952;[56] Chauvin, 1961;[57] Freeman, 1961;[58] Rao, 1962,[59] 1963,[60,61]); at the level of experimental situations (Sanders, 1962;[62] Casper, 1952;[63] Osis and Pienaar, 1956;[64] Freeman, 1962;[65] Stanford, 1970[66]); and also when contrasting mental states or sets (Rao, 1964[67]) occur in the same subject. For example, in a series of language ESP experiments in which Telugu and English words were used as target material, Rao (1963)[68] found that his male subjects consistently obtained significantly more hits on Telugu targets than on English targets. Rao (1964)[69] also found that his subject, SH, obtained significantly more hits in a "relaxed" state induced by hypnotic suggestion than she did in the pre-relaxed state. Sanders (1962)[70] found that when his subjects worked under two contrasting conditions, writing or calling their guesses, they scored positively with the preferred method and negatively with the non-preferred method. Also, Freeman (1962)[71] found that when he gave precognition and clairvoyance tests to his subjects, they obtained positive scores in precognition and negative scores in clairvoyance tests. Rao (1964)[72] also found evidence for the occurrence of the differential response in a two-task situation. When he alternated the language ESP test with a test involving ESP symbols and masks, he found that the subjects who scored more than mean chance expectation on one task tended to obtain less than MCE on the other task and *vice versa*. Stuart (1946),[73] Casper (1952),[74] Rice and Townsend (1962),[75] and White and Angstadt (1963)[76] published reports in which the subjects showed differential response between agents in GESP experiments.

These studies of the differential response have thus shown that when subjects are made to work under contrasting experimental conditions, they tend to obtain positive scores under one set of conditions and negative scores under the other.

It may be noted however that while the occurrence of the differential response is fairly widespread, with the possible exception of

Rao's (1963, 1964)[77,78,79] language ESP experiments, there was little consistency in the direction of the results in this area. The vagaries of shifts of preference in the differential situation is amply illustrated by Rao's own work with what he called the "choice" cards. In his first experimental study (1962),[80] he asked the subjects to prepare their own decks of cards by writing or drawing symbols of their choice on the blank cards provided. These decks of choice cards were then used alternately with the standard ESP cards. In this study, the subjects obtained significantly more hits on choice cards than on ESP cards. When in the next experiment (1963),[81] Rao mixed the choice cards with the ESP cards so that the subjects did not know whether they were guessing an ESP card or a choice card, he again found a strong tendency on the part of the subjects to psi-hit on one set and psi-miss on the other; but this time the positive scoring was on the ESP cards. This is a reversal of his previous finding. In another study, Rao (1963)[82] showed how the differential scoring on ESP and choice cards reversed itself within the same testing situation. Similar reversals in scoring direction are reported by other investigators, e.g., Schmeidler, 1964.[83]

Thus the fact of differential scoring is clearly established. However, why a subject scores positively on one set of targets and negatively on the other still remains a puzzle. This challenge, coupled with the frequency of occurrence of the differential effect in laboratory studies, promises an area of inquiry which may provide significant leads to the understanding of the nature of psi. Again, it is likely that there are so many uncontrolled or uncontrollable variables that we are unable to make dependable predictions on the direction of scoring in differential situations. Perhaps if we can bring into the experimental situation the same personal involvement and relevancy determined by deep subject needs that are so commonly seen in life situations, it may be possible to obtain a better measure of consistency in differential scoring. The series of experiments that are reported in the following pages are attempts in that direction.

II

THE PRELIMINARY EXPERIMENT

If psi is primarily a spontaneous phenomenon, as McConnell contends, the greater the similarity of the laboratory situation to the life setting, the closer one would be to catching ESP in the laboratory. Again, if an essential aspect of the life situation is its human relevance and the motivational involvement of the subject, then a genuine need-oriented test situation might enable the subject to achieve a more dependable ESP performance. Such a performance in relation to the differential effect may not only enable us to understand the reasons for differential scoring, but may also throw light on the nature of psi in general because the differential effect seems to be an essential aspect of psi. It is with these assumptions that the following preliminary investigation was undertaken. The objective of the study is to explore the relationship between personality and situational factors on the one hand and ESP on the other in the context of a demanding life situation. The study is considered preliminary or pilot in so far as the inferences drawn from the results of this experiment would form the basis for hypotheses to be tested in the following studies.

The Situation

The preliminary experiment was built into a situation in which a number of applicants were seeking admission into the postgraduate diploma course in library science at Andhra University. This is one of the more popular courses and many more applications than the available seats are received. After a preliminary screening on the basis of their grades in their undergraduate studies, the applicants were called for an interview with the Head of the Department of

Library Science. The supervisor of this research, Dr. K. Ramakrishna Rao (KRR) was then the Head of the Department of Library Science. In that capacity he was solely responsible for interviewing and selecting the applicants. The applicants were quite anxious to secure admission and several of them had come at their own expense, traveling long distances. Most of them came from various parts of Andhra Pradesh, with only a few from other states. They came solely for the interview and had no idea that there would be any tests before or after.

When an applicant came to KRR's office at the scheduled time for the interview, he was informed by a secretary that he had to take a psychology test before the interview and was taken to the office of one of the experimenters. Even though the applicant was not told that the scores he obtained in the test had anything to do with his selection, it was strongly implied that those tests had something to do with the selection of candidates for admission. Thus the ESP test was related to the life situation in so far as the subjects approached the test in an atmosphere in which they felt that their admission to the Department of Library Science depended, at least in part, on their success in the ESP test.

The Variables

There are three sets of variables on which data are sought. First is the interest in finding out how the ESP would manifest in a differential situation involving ESP testing before and after the interview. It is assumed that the subjects would be highly charged, motivated, anxious, and tense in the first session and somewhat relaxed in the post-interview session. These contrasting mental states are expected to give rise to differential scoring.

The second set of variables consists of personality and motivational parameters which are believed to separate psi-hitters and missers. These are (1) whether the subject in the interview situation manifests confidence or nervousness; (2) whether he is communicative or inhibited during the interview; and (3) how much motivated is he to study library science.

The third variable is to see whether a differential response between two different languages, such as the one obtained by Rao (1963),[84] Kanthamani (1965),[85] and Sailaja (1965)[86] would occur

in the present situation which involves a population familiar with the two languages employed. The language ESP studies of Rao, Kanthamani, and Sailaja involved American subjects who were familiar with one language and not the other.

Procedure

Two experimenters, B. K. Kanthamani (BK) and P. Sailaja (PS), gave the ESP tests. Both of them used a clairvoyance technique called the blind matching technique. This technique consists in having the subject match a deck of target cards against five envelopes containing the key cards. The subject is blind to both the key cards and the target cards. One of the experimenters (BK) used standard ESP cards as target material, the other employed language ESP cards in Telugu and English developed by Rao (1964)[87] and used in his language ESP experiments.

The language ESP cards bear five words: *Love, Fish, Tree, Ball,* and *Peace*. One of these words in English or an equivalent word in Telugu is inscribed on each card. The deck consists of 50 cards—25 cards with Telugu words and 25 with English words. Each word is of course represented an equal number of times. Thus there are, for example, 5 cards with the English word *Ball* and 5 cards with the Telegu word for ball.

When the subject was brought to the experimental room for an ESP test, the experimenter spent some time conversing informally so as to establish a friendly rapport. Then she explained the nature of the ESP test, introduced the target material, and explained the procedure of the experiment in the following way:

The test I am going to give you is an ESP test. These cards are called ESP cards. Look here, there are 5 symbols: the star, the wavy lines, the cross, the circle and the square. This deck contains 50 cards with 10 of each symbol. Now each of these envelopes contains one of the 5 symbols. Neither you nor I know what symbol is in the envelope. I shall shuffle these ESP cards and give them to you. All that you have to do is to match each of these cards against one of the envelopes in front of you so that the card you place opposite an envelope will match with the card inside that envelope. You don't need to keep an equal number of cards in each pile. It is best if you don't keep track of how many cards you have in any pile. The number of cards that correctly match the cards inside the envelopes is your ESP score. I hope you get a very good score. Do you have any questions?

The experimenter tried to answer whatever questions the subject asked. The instructions given by PS were identical except that she used the language cards instead of the ESP cards. Both experimenters used closed decks.

After explaining the test and making sure that the subject understood it, the experimenter took out the key cards from the envelopes, held them face down, shuffled them and inserted them into five opaque black envelopes, with her hands under the table at the opposite end of which the subject was seated. The envelopes were then shuffled before they were placed on the table with their open ends toward the experimenter and the flaps down.

Then, the experimenter shuffled the deck of fifty target cards, gave it a dovetail cut, shuffled it again and handed it over to the subject. The subject was asked to match the cards against the envelopes containing the key cards and to try to match as many correctly as possible in order to obtain a high ESP score. After the completion of the run of 50 cards, the experimenter opened the first envelope on her extreme left and recorded it in the record sheet. Then she opened the target cards opposite that envelope, recorded them one after another and circled those that were found to match the key cards.

In the language ESP experiment, each envelope contained two key cards, one Telugu and one English. The English target cards were matched against the English keys and the Telugu targets against the Telugu keys. Except for this difference the procedure adopted by the two experimenters was identical.

After completion of the scoring of the first run, the subject was given another run following identical procedure. This procedure was followed by both experimenters, except in one case when the subject was given only one run. The subject was then led to KRR'S office for the interview. He was asked to return to the same experimenter for some more tests after the interview.

KRR interviewed the subject to ascertain whether he would make a good librarian. In addition, he also tried to obtain a clinical profile of the subject on three dimensions: (1) whether the subject is confident or nervous in facing the interview; (2) whether he appears to be communicative or inhibited in his answers to the inter-

view questions; and (3) whether he is anxious or indifferent about his admission into the library science course.

The interviewer rated the subjects on these dimensions on a five-point scale. The ratings on the "confident-nervous" dimension were made on the basis of the subject's mode of response to the questions, slurring of speech if any, bodily movements (tremor of hands, etc.), and apparent perspiration during the course of the interview. The subjects were rated on a "communicative-inhibited" dimension on the basis of their readiness to answer questions as well as their facility in expressing themselves. The "anxious-indifferent" dimension is intended to measure the motivation of the subject to study library science. Information bearing on this was elicited by asking a number of questions as to why he was seeking admission into the course. According to the interviewer the ratings on the "anxious-indifferent" dimension were the most difficult to make as the subjects tended to give more or less set answers.

When the subject was through with the interview, he went back to the experimenter who had given him the ESP test. He again did two ESP runs. The test procedure was identical in all respects with the one given before the interview. With the exception of one subject who did only one run, all subjects did two runs of 50 trials each.

Results

Twenty-two subjects came for the interview and they were all given ESP tests. Twelve took the ESP test with BK and ten took the language ESP test with PS. The subjects were of course tested individually and the same experimenter gave the ESP test before and after the interview. KRR kept the interview records and BK and PS kept their ESP records of their subjects until the experiment was over.

The results of both experimenters were pooled to test the occurrence of the differential effect between the pre- interview and post-interview ESP scoring and also to see whether there is any relationship between the interviewer's ratings of the subjects and their total ESP scores. A separate analysis was also made to see whether the subjects showed any differential effect between Telugu and English targets.

The general results of all 22 subjects are given in Table 1. The 22 subjects did 43 runs of 50 cards in the pre-interview session (each subject, except one, did 2 runs). They did 43 more runs in the post-interview session, and obtained 424 hits (—6) in the pre-interview session and 465 hits (+35) in the post-interview session. The average run scores in the pre- and post-interview sessions are 9.86 and 10.81 respectively, where the mean chance expectation is 10 hits per run.

TABLE 1

PRELIMINARY EXPERIMENT

ESP Scores in Pre- and Post-Interview Sessions

	Pre-Interview Session			*Post-Interview Session*			
	First Run	*Second Run*	*Total*	*First Run*	*Second Run*	*Total*	*TOTAL*
Subjects (N)	22	21	22	22	21	22	22
Runs	22	21	43	22	21	43	86
Hits	191	233	424	246	219	465	889
Deviation	—29	+23	—6	+26	+9	+35	+29
Avg. per Run	8.68	11.10	9.86	11.18	10.43	10.81	10.34

NOTE: A run in this table and in the following tables is equal to 50 trials. The mean chance expectation is 10 hits per run.

A test of significance (see Table 2) for the difference between the two means gives a t of 1.83 which falls short of reaching significance at the 5% level.

It is assumed that, if there is any differential effect between pre- and post-interview testing, it is likely to be more pronounced in the first runs than in the second. This assumption is based on the belief that whatever is the mood or set generated by the life situation, it is more likely to be present during the beginning of the session than at the end. The results are therefore analyzed to test the difference between the scores the subject obtained in the first run of the pre-interview session and those he obtained in the first run of the post-interview session. In the pre-interview session the subjects obtained 191 hits, an average of 8.68 per run of 50 trials. In the post-interview session they obtained 246 hits, an average of 11.18 hits. A

t test of the difference between the means of the two sessions (Table 3) gives a highly significant t of 3.68 ($p<.002$).

The ESP scores of the subjects are also analyzed in terms of the interview ratings. On the "confident-nervous" rating, the lower the rating the more confident and less nervous is the subject. Similarly, on the other scales the lower ratings indicate that the subject is anxious to be admitted to the course and that he is communicative and not inhibited in the interview. Conversely, the higher the rating, the less confident the subject is, less motivated to join the course and poor in communication.

TABLE 2

PRELIMINARY EXPERIMENT

Average Run Scores of Each Subject in Pre- and Post-Interview Sessions

N	*Pre-Interview Average ESP Run Score*	*Post-Interview Average ESP Run Score*
1	10.5	10.0
2	12.0	8.5
3	8.0	12.0
4	11.5	14.0
5	7.5	7.5
6	8.5	10.0
7	9.0	9.5
8	8.5	11.0
9	12.0	13.0
10	7.5	10.5
11	11.0	17.5
12	7.5	9.5
13	6.0	9.0
14	7.0	5.5
15	12.5	10.0
16	10.5	11.0
17	12.5	12.0
18	11.0	9.5
19	9.5	13.5
20	11.0	9.5
21	12.5	11.0
22	9.5	13.0

$t = 1.83$, d.f. $= 21$, NS

TABLE 3

PRELIMINARY EXPERIMENT

First Run Scores in Pre- and Post-Interview Sessions

N	*Pre-Interview Score*	*Post-Interview Score*
1	7	10
2	8	9
3	6	15
4	11	15
5	4	9
6	9	11
7	10	9
8	7	11
9	15	16
10	8	10
11	13	19
12	5	9
13	6	9
14	7	3
15	8	11
16	10	13
17	13	14
18	9	8
19	10	12
20	11	8
21	8	10
22	6	15

$t = 3.68$, d.f. $= 21$, $p < .002$

The confident, anxious, and communicative ratings of the subjects are added up for each subject because it is expected that the subjects who are confident in facing the interview, anxious to be admitted to the course, and are communicative would be able to register a better ESP performance than their counterparts. On the basis of the combined scores on the three dimensions, the subjects are divided into two groups—those above the mean for the group and those below the mean. The obtained mean is 7.82 for the group. The subjects with ratings of 7 or less on the combined three dimensions made up Group I. The others with ratings of 8 or more made up Group II.

There are 10 subjects in Group I and 12 in Group II. Table 4 gives the results of this analysis. The 10 subjects in Group I obtained

TABLE 4
PRELIMINARY EXPERIMENT
ESP Scores of "Confident-Anxious-Communicative" versus "Nervous-Indifferent-Inhibited" Subjects

	Group I Confident-Anxious-Communicative	*Group II Nervous-Indifferent Inhibited*
Subjects	10	12
Runs	38	48
Hits	354	535
Deviation	—26	+55
Avg. per Run	9.32	11.15

354 hits in 38 runs (—26), an average of 9.32 hits per run of 50 trials and the 12 subjects in Group II obtained 535 hits in 48 runs (+55), an average of 11.15 hits per run. The difference in the rate of scoring between the means of the two groups is analyzed in terms of a *t* ratio (see Table 5). The obtained *t* is 2.66. With 20 d.f., it

TABLE 5
PRELIMINARY EXPERIMENT
Average Run Scores of "Confident-Anxious-Communicative" versus "Nervous-Indifferent-Inhibited" Subjects

N	*Confident-Anxious-Communicative*	*N*	*Nervous-Indifferent-Inhibited*
1	10.25	1	10.25
2	7.50	2	10.00
3	9.25	3	12.75
4	9.25	4	14.25
5	9.75	5	8.50
6	12.50	6	11.25
7	9.00	7	10.75
8	7.00	8	12.25
9	6.00	9	10.25
10	11.25	10	11.50
		11	10.25
		12	11.75

$t = 2.66$, d.f. $= 20$, $p < .02$

is significant beyond the 2% percent level. This means that the "confident-anxious-communicative" subjects scored significantly lower than the relatively nervous, inhibited and less motivated subjects. Table 6 gives the results analyzed in terms of the interviewer's ratings of the subjects on the three dimensions separately. As the mean for

TABLE 6
PRELIMINARY EXPERIMENT
Interview Ratings and ESP Scores

	Confident	*Nervous*	*Anxious*	*Indifferent*	*Communicative*	*Inhibited*
Subjects	7	15	13	9	9	13
Runs	26	60	51	35	34	52
Hits	217	672	547	342	345	544
Deviation	—43	+72	+37	—8	+5	+24
Avg. per Run	8.35	11.20	10.72	9.77	10.15	10.46

the confident-nervous rating is between 2 and 3, subjects rated 2 or less on this dimension are grouped as "confident" and the others rated 3 and above are grouped as "nervous." The 7 confident subjects scored 217 hits (—43) in 26 runs with an average of 8.35 hits per run. The 15 nervous subjects obtained 672 hits in 60 runs (+72), an average of 11.20 per run. The difference between the scoring rate of the two groups is highly significant with a t of 4.67, $P<.001$ (see Table 7). The nervous subjects obtained significantly more hits than the confident subjects.

The remaining two ratings, viz., the anxious-indifferent and the communicative-inhibited did not show any significant differences in scoring (see Table 6). The 13 anxious subjects obtained 547 hits in 51 runs (+37) with average of 10.72 per run. The 9 indifferent subjects obtained 342 hits in 35 runs (—8) with an average of 9.77. The difference between the scoring rate of the two groups gives an insignificant t of 1.17. In the third rating, that of communicative-inhibited, there were 9 communicative subjects who obtained 345 hits in 34 runs (+5) with an average of 10.15. The 13 inhibited subjects obtained 544 hits in 52 runs (+24) with an average of 10.46. The difference between the scoring rate of communicative and inhibited subjects gives an insignificant t of 0.60. It can be seen

TABLE 7

PRELIMINARY EXPERIMENT

Average Run Scores of "Confident" versus "Nervous" Subjects

N	*Confident*	*N*	*Nervous*
1	10.25	1	10.25
2	7.50	2	10.00
3	9.25	3	12.75
4	9.00	4	9.25
5	8.50	5	9.75
6	7.00	6	12.50
7	6.00	7	14.25
		8	11.25
		9	10.75
		10	12.25
		11	10.25
		12	11.50
		13	10.25
		14	11.75
		15	11.25

$t = 4.67$, d.f. $= 20$, $p < .001$

that only the results on the "anxious-indifferent" dimension are in consonance with our expectation. The significantly better scoring of the "nervous-indifferent-inhibited" group than their counterparts, which is contrary to our expectation, is contributed entirely by the confident-nervous rating.

The results obtained by PS with language ESP cards are given in Table 8. The 10 subjects who participated in the language ESP test obtained a total score of 396 hits in 38 runs of 50 trials (+16).

They obtained 198 hits on Telugu targets and 198 hits on English targets. In other words, the subjects' scores on English and Telugu targets give a zero difference. And when subjects were divided into male and female, we find that the 6 male subjects obtained 118 hits on Telugu targets and 122 on English targets. The 4 female subjects obtained 80 hits on Telugu targets and 76 hits on English targets. Neither of the differences between the Telugu and English targets is significant. Thus we find that, unlike the American subjects in a previous study, the subjects in this study did not respond differentially to Telugu and English targets.

TABLE 8

PRELIMINARY EXPERIMENT

ESP Scores of Male and Female Subjects on Telugu and English Targets

	Male Subjects		*Female Subjects*		*Total*	
	Telugu	*English*	*Telugu*	*English*	*Telugu*	*English*
Subjects	6	6	4	4	10	10
Trials	575	575	375	375	950	950
Hits	118	122	80	76	198	198
Deviation	+3	+7	+5	+1	+8	+8

A comparative analysis of the results obtained by the two experimenters is given in Table 9. BK with her 12 subjects obtained 493 hits (+13), an average of 10.27 hits per run of 50 trials. PS obtained 396 hits in 38 runs (+16), an average of 10.42 hits per run. Both experimenters obtained scores above the MCE and there is no significant difference in the rate of scoring between the subjects of the two experimenters. BK's subjects obtained 227 hits in the pre-interview session and 266 hits in the post-interview session. The difference in the rate of scoring between the two sessions gives a t of 2.27. With 11 d.f., this t is significant at the 5% level (see Table 10).

PS obtained 197 hits in the pre-interview session and 199 hits in the post-interview session, showing that there is not much of a difference in the rate of scoring between the two sessions. Even though the subjects obtained more hits in the second session than in the first session with both experimenters, the effect is significant with BK's subjects alone. When the first run of the first session is compared with the first run of the second session, separately for both experimenters, we find that BK's subjects obtained 103 hits in the first run of the first session, an average of 8.58 hits per run, and 143 hits in the first run of the second session, an average of 11.92 hits. The subjects of PS obtained a score of 88 hits, an average of 8.80 in the first runs of the pre-interview session and 103 hits in the first runs of the post-interview session (an average of 10.30 hits). Again, the results of both experimenters are in the same direction, even though only the differences in BK's data are significant with a t of 4.40, d.f. 11, $p<.002$ (see Table 11). It should be mentioned, how-

TABLE 9

PRELIMINARY EXPERIMENT

ESP Results of Subjects Analyzed in Terms of Experimenters

	BK as Experimenter							*PS as Experimenter*						
	Pre-Interview			*Post-Interview*				*Pre-Interview*			*Post-Interview*			
	1st Run	*2nd Run*	*Total*	*1st Run*	*2nd Run*	*Total*	*TOTAL*	*1st Run*	*2nd Run*	*Total*	*1st Run*	*2nd Run*	*Total*	*TOTAL*
Subjects	12	12	12	12	12	12	12	10	9	10	10	9	10	10
Runs	12	12	24	12	12	24	48	10	9	19	10	9	19	38
Hits	103	124	227	143	123	266	493	38	109	197	103	96	199	396
Deviation	—17	+4	—13	+23	+3	+26	+13	—12	+19	+7	+3	+6	+9	+16
Avg. per Run	8.58	10.32	9.47	11.92	10.24	11.08	10.27	8.80	12.11	10.37	10.30	10.67	10.46	10.42

ever, that at this point it is difficult to attribute whatever differences that may exist between the results obtained by the two experimenters to any experimenter difference because of the different nature of the ESP tests employed by the experimenters. One used ESP cards while the other employed language cards as targets.

TABLE 10
PRELIMINARY EXPERIMENT
ESP Scores of BK's Subjects in Pre- and Post-Interview Tests

N	*Pre-Interview*	*Post-Interview*
1	21	20
2	24	17
3	16	24
4	23	28
5	15	15
6	17	20
7	18	19
8	17	22
9	24	26
10	15	21
11	22	35
12	15	19

$t = 2.27$, d.f. $= 11$, $p < .05$

TABLE 11
PRELIMINARY EXPERIMENT
First Run Scores of BK's Subjects in Pre- and Post-Interview Tests

N	*Pre-Interview*	*Post-Interview*
1	7	10
2	8	9
3	6	15
4	11	15
5	4	9
6	9	11
7	10	9
8	7	11
9	15	16
10	8	10
11	13	19
12	5	9

$t = 4.40$, d.f. $= 11$, $p < .002$

Discussion

It does not seem unreasonable to assume that this experiment gave evidence of ESP because of the significant differences between the ESP scores in pre- and post-interview sessions and between the scores of confident and nervous subjects. If we assume, as an alternative to the ESP hypothesis, that there was a possibility of information leakage because of the presence of sensory cues, or because of deliberate trickery on the part of some subjects, one or more of the following should be the case: (1) the subjects knew by normal means both the key cards and target cards; (2) they knew only the key cards; (3) they knew only the target cards. That the first alternative is not the case is obvious from the overall results of the experiment which are not significantly different from chance expectation. The obtained total score is 889 hits and the chance expected score is 860 hits. If the subjects, who were motivated to obtain high scores, did obtain information through normal channels, they should have scored significantly more hits than MCE. Thus the first alternative is ruled out. If the subjects had cues to the key cards but not to the target cards, it makes no difference in the experiment because there is no way the subjects could influence the results by normal means. Even if we assume that the subjects identified target cards by some sensory means, we will still not be able to explain the results unless we assume also that they had cues to the key cards. Moreover, even if there were a leakage of information through normal channels, it does not seem reasonable that significant differences in the rate of scoring such as those found here could have been obtained. For instance, how can we account for the negative scoring of "confident" subjects as opposed to the "nervous" subjects? We cannot reasonably assume that the "nervous" subjects cheated to obtain the positive scores and the "confident" subjects cheated to obtain negative deviations. Similarly, it does not make sense to think that the sensory cues were used to obtain psi-missing in the pre-interview session and psi-hitting in the post-interview session.

If one is confident, then, that ESP is a reasonable explanation for these results, two conclusions seem to follow: (1) When subjects are made to take an ESP test before and after an interview that will determine something important to them, then their ESP performance immediately following the interview tends to be better than

their performance in the tests given before the interview. (2) Subjects who are judged to be nervous during the course of the interview tend to obtain better ESP scores than those who appear confident.

The language ESP experiment did not yield the expected differential response between the Telugu and the English targets. Rao (1963, 1964)[88,89,90] as well as Sailaja (1965)[91] have reported language ESP experiments which yielded significant differences in the rate of scoring on Telugu and English targets. No such differences occurred in this study. Also the sex differences as reported by Rao (1963)[92] did not occur. But it must be mentioned that all of the previous published studies of language experiments were conducted with American subjects who did not know any Telugu and to whom crossing the language barrier was a real challenge. The subjects in the study reported here knew both Telugu and English and consequently that challenge was of little significance. This may explain why the differential effect between the two language targets did not occur in this study.

III

THE FIRST CONFIRMATORY EXPERIMENT

Introduction

The results of the preliminary experiment enabled us to focus on some hypotheses and ignore the others. The present confirmatory study is undertaken specifically to test the hypotheses derived from the preliminary study under experimental conditions that are as nearly identical as possible with those of the preliminary experiment.

The language ESP tests did not offer any additional possibilities for the occurrence of psi. In fact, they contributed very little to the differential effect between the pre- and post-interview sessions found in the preliminary experiment. Therefore, only the ESP cards are employed in the present experiment.

Since the "anxious-indifferent" and the "communicative-inhibited" dimensions did not yield any significant differences between the subjects' ESP scoring, and since the combined effect of the three dimensions was solely due to the "confident-nervous" dimension, it is proposed to use only the confident-nervous rating in the present experiment. Further it is realized that the interviewer's rating is subjective and that a separate measure to rate objectively this dimension is needed. As the confident-nervous dimension seemed very much like manifest anxiety, it is believed that the scores on the Taylor's Manifest Anxiety Scale (1953)[93] might make it possible to separate the hitters from the missers in ESP testing of the sort undertaken here.

The testing in a life situation is continued because it is assumed that the heightened motivational involvement of the subject in such a situation would render other variables ineffective and the genuine

effects become easily reproducible. This of course is the main assumption that led to the present series of studies.

The hypotheses derived from the preliminary study and subjected to test in the present experiment are stated as follows:

1) (a) The subjects in an ESP test will score fewer hits if they are tested just before a scheduled interview than if tested immediately after the interview when the interview is of some prime importance to them. (b) This effect will be more pronounced in the first 50 trials of the two sessions compared to the last 50 trials.

2) (a) The subjects rated as nervous by the interviewer will score more hits per run than those rated as confident. (b) The high-anxious subjects, defined as those obtaining more than the mean for the group on the Manifest Anxiety Scale will score significantly more hits than the low-anxious, defined as those scoring below the group mean on the MAS.

Procedure

The experimental situation involved and the testing procedure employed are very similar to the preliminary experiment. This experiment is also built into a situation where a number of people are seeking admission into the post-graduate diploma course in library science at Andhra University. Dr. Ramakrishna Rao (KRR) was still the Head of the Department of Library Science and was responsible for the selection. His involvement in the selection process of applicants as well as in this research is crucial and because of this the ESP test assumed the seriousness it did for the subjects. After a preliminary screening, a number of applicants were notified to appear for an interview with the Head of the Library Science Department. Before they came, the applicants had no idea that they had to take any tests before or after the interview.

When the subject came for the interview, he was told by the departmental secretary that he must take a psychology test before the interview and was then led to the experimenter's office. The experimenter gave a test with standard ESP cards, employing the blind matching technique, and instructed the subject in a manner identical to the one described in the previous chapter.

After familiarizing the subject with the ESP symbols and the test procedure, the experimenter took 5 key cards, each one bearing one

of the 5 standard ESP symbols, viz., star, cross, circle, square and wavy lines, shuffled them well, and holding the cards face down inserted them into five opaque black envelopes. The envelopes were shuffled before being placed on the table with their open ends toward the experimenter and the flaps down. Then the experimenter handed over a well shuffled deck of 50 ESP cards to the subject. It was a closed deck. The subject was asked to match the 50 target cards against the 5 key cards and to try to obtain as many hits as possible.

After the completion of one 50-card run, the experimenter opened the first envelope on her extreme left and recorded it on the record sheet. Next, she picked up the target cards opposite that envelope and recorded all of them one by one. Then, she went to the second key card and the second pile of target cards and likewise completed the recording of all the cards. The subject watched the whole procedure. Hits were counted and the subject was told what his score was. Then the cards were shuffled again and the subject did one more run before he went to KRR's office for the interview. The subject was instructed to return to the experimenter's room after the interview for some more tests.

KRR interviewed the subject. Besides ascertaining whether the applicant was qualified for admission into the postgraduate course of library science, KRR rated him on a four-point confident-nervous scale. This time, a four-point scale instead of the original five-point scale was used because in the previous study the interviewer did not use the fifth point. The interviewer based his judgment on the subject's mode of response to the questions, slurring of speech, tremor of hands and apparent perspiration.

After the interview, the subject went back to the experimenter's room for more ESP testing. He did two runs of 50 trials each as he had done in the pre-interview session. After he was through with the tests, the subject was sent to the office of the second experimenter who used the Taylor Manifest Anxiety Scale. BK gave the ESP test and PS applied the MAS rating.

Twenty-six subjects came for the interview and took the ESP tests. Independent records were kept by the three persons concerned with the experiment and the records were pooled only after the testing of all the subjects was completed. As in the previous experiment, the subjects included both males and females.

Results

The overall results of this experiment are given in Table 12.

TABLE 12

FIRST CONFIRMATORY EXPERIMENT

ESP Scores in Pre- and Post-Interview Sessions

	Pre-Interview			*Post-Interview*		
	First Run	*Second Run*	*Total*	*First Run*	*Second Run*	*Total*
Subjects	26	26	26	26	26	26
Runs	26	26	52	26	26	52
Hits	239	247	486	307	286	593
Deviation	—21	—13	—34	+47	+26	+73
Avg. per Run	9.19	9.50	9.35	11.81	11.00	11.40

Each subject did two runs of 50 trials before the interview and an equal number of runs after the interview. The 26 subjects tested obtained 486 hits (—34) in a total of 52 runs of 50 trials in the pre-interview session. This gives an average of 9.35 hits per run. In the post-interview session they obtained 593 hits (+73) for the same number of runs. This is an average of 11.40 hits per run. A t test of the difference between the mean scores of the subjects during the pre- and post-interview sessions gives a t of 6.65. With 25 d.f., it is significant well beyond the .001 level (see Table 13).

On the basis of the results of the preliminary experiment, we predicted that the differential effect between the pre- and post-interview sessions would be more pronounced in the first runs than in the second runs. The subjects in this study averaged 9.19 hits in the first runs of the pre-interview session and 11.81 hits during the first runs of the post-interview session. They averaged 9.50 hits and 11.00 hits during the second runs of pre- and post-interview sessions respectively. The t ratios are computed for the differences of the means. The t ratio for the difference between the first run scores of the pre- and the post-interview session is 5.14. With 25 d.f., it is significant beyond the .001 level (Table 14). The t for the difference between the scores of the second runs in the pre- and in the post-interview session is 3.26 $p<.01$ (see Table 15). Thus the t for the difference between the first

run scores of the pre- and the post-interview session is larger than the t for the difference between the second run scores. However, it should be pointed out that there is no significant difference between the first and second runs in the percentage of subjects scoring more hits in the post-interview session than in the pre-interview session. In both, 76.92% of the subjects scored more hits in the post-interview than in the pre-interview session and 23.08% of the subjects did better in the pre-interview session or showed no difference in the pre- and post-interview scores.

TABLE 13

FIRST CONFIRMATORY EXPERIMENT

ESP Scores of Each Subject in Pre- and Post-Interview Sessions

N	*Pre-Interview*	*Post-Interview*
1	17	20
2	20	21
3	22	25
4	15	22
5	22	23
6	16	18
7	22	22
8	23	25
9	22	28
10	16	28
11	20	23
12	21	24
13	19	26
14	18	22
15	20	21
16	18	21
17	16	24
18	19	23
19	16	16
20	18	20
21	17	24
22	19	22
23	19	25
24	18	24
25	13	24
26	20	22

$t = 6.65$, d.f. $= 25$, $p < .001$

TABLE 14

FIRST CONFIRMATORY EXPERIMENT

First Run Scores in Pre- and Post-Interview Sessions

N	*Pre-Interview*	*Post-Interview*
1	8	10
2	9	8
3	12	13
4	8	10
5	11	8
6	7	12
7	11	12
8	13	13
9	12	16
10	6	13
11	10	10
12	12	12
13	10	15
14	8	11
15	7	11
16	8	9
17	8	14
18	9	15
19	9	9
20	9	14
21	9	12
22	9	10
23	9	13
24	8	13
25	5	11
26	12	13

$t = 5.14$, d.f. $= 25$, $p < .001$

The results relating to the confident-nervous rating are given in Tables 16 and 17. Twelve subjects obtained ratings of 2 or less and they constituted the confident group. Thirteen subjects received ratings of 3 and above and they comprise the nervous group. One subject was not rated by the interviewer and, therefore, his ESP results were not included in analyzing the difference between the ESP scores of the confident and nervous groups. The 12 confident subjects obtained 476 hits (—4), an average of 9.92 hits per run of 50 trials. The 13 nervous subjects scored 559 hits (+39), an average of

TABLE 15

FIRST CONFIRMATORY EXPERIMENT

Second Run Scores in Pre- and Post-Interview Sessions

N	*Pre-Interview*	*Post-Interview*
1	9	10
2	11	13
3	10	12
4	7	12
5	11	15
6	9	6
7	11	10
8	10	12
9	10	12
10	10	15
11	10	13
12	9	12
13	9	11
14	10	11
15	13	10
16	10	12
17	8	10
18	10	8
19	7	7
20	9	6
21	8	12
22	10	12
23	10	12
24	10	11
25	8	13
26	8	9

$t = 3.26$, d.f. $= 25$, $p < .01$

TABLE 16

FIRST CONFIRMATORY EXPERIMENT

ESP Scores of "Confident" versus "Nervous" Subjects

	Confident	*Nervous*
Subjects	12	13
Runs	48	52
Hits	476	559
Deviation	−4	+39
Average per Run	9.92	10.75

TABLE 17

FIRST CONFIRMATORY EXPERIMENT

Individual ESP Scores—"Confident" versus "Nervous" Subjects

N	*Confident*	*N*	*Nervous*
1	37	1	37
2	41	2	45
3	47	3	44
4	34	4	48
5	44	5	50
6	40	6	43
7	41	7	45
8	39	8	45
9	32	9	40
10	38	10	42
11	41	11	41
12	42	12	42
		13	37

$t = 2.11$, d.f. $= 23$, $p < .05$

10.75 hits per run. The t ratio of the difference between the means is 2.11, $p < .05$. This confirms our hypothesis that the nervous subjects tend to obtain significantly better scores than the confident subjects.

The subjects' scores on the Manifest Anxiety Scale did not bear any relationship to the confident-nervous ratings or the ESP scores of the subjects. The MAS scores and the interviewer's ratings showed no significant relation. The subjects rated as "nervous" have a mean anxiety score of 17.31 and the "confident" subjects have a mean of 15.42. A t test of the difference gives an insignificant t of 0.66 (see Table 18). A biserial correlation also gives an insignificant r.

The MAS scores showed also no significant relationship with ESP scores. The low anxious subjects, i.e., the subjects with MAS scores lower than the group mean, obtained an average of 10.66 hits per run while the high anxious group obtained an average of 10.40 hits per run. The difference between the two means is not only insignificant but is in the opposite direction.

That the MAS scores showed no significant relationship to the subject's ESP score need not come as a surprise. The previous efforts to relate anxiety to ESP scores have not been unequivocal. Rao (1965)[94] reported a significant negative correlation between the Tay-

lor Manifest Anxiety Scale and the ESP scores of his subjects. In his study, the less anxious subjects obtained significantly more hits than the more anxious ones. The results of this experiment are in the same direction as Rao's results, i.e., the low anxious subjects obtained more hits than the high anxious subjects, though not significantly so. The results of Freeman and Nielsen (1964)[95] indicate quite the opposite. Their subjects grouped as high anxious on the basis of MAS scores obtained more ESP scores than the low anxious subjects.

TABLE 18
FIRST CONFIRMATORY EXPERIMENT
Manifest Anxiety Scores of "Confident" versus "Nervous" Subjects

N	*Confident*	*N*	*Nervous*
1	8	1	21
2	11	2	13
3	5	3	21
4	22	4	10
5	16	5	13
6	18	6	11
7	26	7	20
8	7	8	12
9	13	9	23
10	20	10	15
11	25	11	24
12	14	12	8
		13	34
Mean	15.42		17.31

$t = 0.66$, d.f. $= 23$, NS

One may suspect then that the subjects' apparent nervousness during the interview is not so much a manifestation of anxiety. It may simply be an indication of the subjects' motivational involvement. The subject who very badly desires admission may manifest greater nervousness. It could also be that the subject manifesting such nervousness is much too submissive, too docile and an "eager to follow and please the boss" type. The matter no longer looked as simple as it was assumed in the beginning.

In summary, then, the results of this experiment confirm the first hypothesis that the subjects will obtain more hits in the post-

interview session than in the pre-interview session. The results also confirm the hypothesis that the nervous subjects will obtain significantly more hits than the confident subjects. The attempt to objectify the clinical ratings of the interview through an objective test has failed as the MAS scores gave no evidence of any relation to the subjects' ESP scores or the interviewer's ratings.

IV

THE SECOND REPLICATION

The second replication experiment is planned to test the same hypotheses as in the first, but in a situation which is even more important to the participating subjects than the admission situation. In the present study the subjects were applicants for employment. The Manifest Anxiety Scale was not used as it did not appear to measure the same thing as the interviewer's ratings. The interviewer who again rated the subjects on the confident-nervous dimension decided to pay more attention to the subjects so as to obtain better insights into the so-called nervous subjects who did better than the confident subjects in the ESP tests of the last two experiments.

The findings that are subjected to replication in this study are: (1) The subjects in an ESP test tend to obtain more hits when they are tested immediately after an interview than when they are tested just before a scheduled interview, if the interview is going to determine something of prime importance to them. This effect will be more pronounced in the first 50 trials of the pre- and post-interview sessions than in the last 50 trials; (2) the subjects rated as nervous by the interviewer, viz., those obtaining a rating of 3 or 4, tend to obtain more hits per run than those rated as confident, i.e., those obtaining a rating of 2 or less.

Procedure

The life situation surrounding this experimental study is slightly different from the previous one. The subjects in this experiment were not applicants for admission into a course but were seeking employment in the Andhra University Library. KRR, at that time Chief

Librarian of the Andhra University Library, had called for applications for the positions of sorters in the University Library. Sorters arrange the books on the shelves in their proper order, and keep the books and the racks clean and orderly. The minimum educational requirement for the job is the completion of high school education.

Those aware of the unemployment situation in India will appreciate how much even such jobs as sorters are sought and how much they mean to those who have only secondary education. For most of the applicants these jobs meant a great deal. Since there were not any great differences in the educational qualifications of the applicants, the interview was of prime importance in deciding which of them would be selected for the jobs. The applicants believed that the impression they created at the interview would determine their selection. Since KRR was responsible for the selection, the ESP test assumed a great deal of significance for the subjects. Even though the subjects were not told at any time that the results they obtained in the ESP tests had anything to do with their selection, the situation was such that it implied that these results would influence their selection.

The procedure employed for ESP testing is the same as the one described in the previous experiment. The only differences are that two experimenters, BK and PS, administered the ESP test and there was no MAS rating. When the subject came to the Librarian's office for the interview he was told that he must first take a psychology test. He was then sent to the office of one of the experimenters. After spending a few minutes informally with the subject, the experimenter introduced the ESP test to him as in the previous experiments. Employing the blind matching technique, the experimenter asked the subject to do two runs with a deck of 50 ESP cards. At the beginning of each run the subject was encouraged to try for as many hits as possible. After the completion of two runs, the experimenter asked him to go to the Librarian's office for the interview and return to her room when it was over for some more tests.

While interviewing the subject, KRR rated him on the four point confident-nervous scale. This time he attempted to pay more attention to his own process of judging the subject in order to get a better insight into what he was actually judging when rating the subject on the confident-nervous scale.

After the interview, the subject returned to the same experimenter's room and did two more runs. It should be pointed out that the subjects did not know the outcome of their interview, i.e., whether they were selected or not, until at least twenty-four hours after all the tests were completed. This of course was also true for the previous experiments.

In all, 33 subjects came for the interview and took the ESP tests. All the subjects were males. BK and PS administered the ESP tests to the subjects individually. BK tested 17 subjects and PS had 16 subjects.

Results

The overall results of the present experiment are given in Table 19. Each single subject had two runs of 50 trials before the interview, and two runs after the interview. The 33 subjects in this experiment did 66 runs in the pre-interview session and obtained a total of 581 hits (—79), i.e., an average of 8.80 hits per run of 50 trials. In the post-interview session the subjects in an equal number of runs obtained 683 hits (+23) with an average of 10.35 hits per run. A *t* test of the difference between the mean scores of the subjects in the pre- and post- interview sessions, gives a *t* of 4.29. With 32 d.f., this *t* is significant beyond the .001 level (see Table 20).

TABLE 19
SECOND REPLICATION EXPERIMENT
ESP Scores in Pre- and Post-Interview Sessions

	Pre-Interview			*Post-Interview*		
	First Run	*Second Run*	*Total*	*First Run*	*Second Run*	*Total*
Subjects	33	33	33	33	33	33
Runs	33	33	66	33	33	66
Hits	282	299	581	355	328	683
Deviation	—48	—31	—79	+25	—2	+23
Avg. per Run	8.55	9.06	8.80	10.76	9.94	10.35

The results are further analyzed to see whether the differential effect is more pronounced between the first 50 trials of the pre-interview and the first 50 trials of the post-interview sessions than be-

TABLE 20

SECOND REPLICATION EXPERIMENT

ESP Scores of Each Subject in Pre- and Post-Interview Sessions

N	*Pre-Interview*	*Post-Interview*
1	24	29
2	17	24
3	12	17
4	22	23
5	14	20
6	18	20
7	21	22
8	17	21
9	14	21
10	15	23
11	15	23
12	16	23
13	17	22
14	18	20
15	17	24
16	23	24
17	16	19
18	15	17
19	22	16
20	18	25
21	13	24
22	15	19
23	21	21
24	16	18
25	16	20
26	20	17
27	20	23
28	17	15
29	14	17
30	25	19
31	14	19
32	15	20
33	24	18

$t = 4.29$, d.f. $= 32$, $p < .001$

tween the last 50 trials of the pre-interview and the last 50 trials of the post-interview sessions. The subjects obtained an average of 8.55 hits in the first 50 trials and 9.06 in the second 50 trials of the pre-interview session, and 10.76 hits in the first 50 trials and 9.94 hits

in the second 50 trials of the post-interview session. The difference between the mean scores of the first 50 trials (first run) of the pre-interview and those of the first 50 trials of the post-interview session (Table 21) gives a t of 3.75 ($p<.002$). The t for the difference be-

TABLE 21
SECOND REPLICATION EXPERIMENT
First Run Scores in Pre- and Post-Interview Sessions

N	*Pre-Interview*	*Post-Interview*
1	9	14
2	9	11
3	5	9
4	15	8
5	11	12
6	8	10
7	9	10
8	12	11
9	9	9
10	6	11
11	6	8
12	7	15
13	8	14
14	5	10
15	7	15
16	8	11
17	7	9
18	7	9
19	13	10
20	12	16
21	6	16
22	6	10
23	9	12
24	7	8
25	10	12
26	9	10
27	11	14
28	9	9
29	4	6
30	10	9
31	9	8
32	7	11
33	12	8

$t = 3.75$, d.f. $= 32$, $p<.002$

tween the scores of the second runs of the pre- and post-interview testing is 1.54 and is insignificant (see Table 22).

In the first runs, 25 of the 33 subjects obtained more hits in

TABLE 22

SECOND REPLICATION EXPERIMENT

Second Run Scores in Pre- and Post-Interview Sessions

N	*Pre-Interview*	*Post-Interview*
1	15	15
2	8	13
3	7	8
4	7	15
5	3	8
6	10	10
7	12	12
8	5	10
9	5	12
10	9	12
11	9	15
12	9	8
13	9	8
14	13	10
15	10	9
16	15	13
17	9	10
18	8	8
19	9	6
20	6	9
21	7	8
22	9	9
23	12	9
24	9	10
25	6	8
26	11	7
27	9	9
28	8	6
29	10	11
30	15	10
31	5	11
32	8	9
33	12	10

$t = 1.54$, d.f. $= 32$, NS

the post-interview period than in the pre-interview and 8 subjects scored in the opposite direction or showed no difference. In the second runs, only 16 subjects obtained more hits in the second session. Seventeen subjects scored better in the pre-interview session or showed no difference. A 2×2 chi-square test of the difference gives a chi-square of 5.22 ($p<.025$). We may consider this result as significant evidence of decline of the differential effect from the first to second runs (see Table 23).

The results pertaining to the confident-nervous subjects are given in Table 24. There were 16 subjects who were rated as confident and 16 subjects who were rated as nervous. One subject was not

TABLE 23

SECOND REPLICATION EXPERIMENT

A 2×2 Subject Contingency Test: Differential Scoring in First Runs versus Second Runs

	First Run	*Second Run*	*Total*
No. of subjects obtaining more hits in Post-Interview than in Pre-Interview tests	25	16	41
No. of subjects not obtaining more hits in Post-Interview than in Pre-Interview tests	8	17	25
Total	33	33	66

$x^2 = 5.22$, d.f. $= 1$, $p<.025$

TABLE 24

SECOND REPLICATION EXPERIMENT

ESP Scores of "Confident" versus "Nervous" Subjects

	Confident	*Nervous*
Subjects	16	16
Runs	64	64
Hits	623	599
Deviation	—17	—41
Average per Run	9.73	9.36

rated by the interviewer. The 16 confident subjects obtained a total of 623 (—17) hits for 64 runs of 50 trials with an average of 9.73 hits per run. The other 16 subjects who were rated as nervous obtained 599 hits (—41) in 64 runs with an average of 9.36 hits per run. Both the confident and nervous subjects scored below the mean chance. The difference between the ESP scores of the confident and the nervous groups is not significant. In fact, contrary to our expectation, the confident group obtained a slightly higher average than the nervous group.

Thus, we find our results supporting the first hypothesis, viz., the subjects tend to score more hits in the ESP tests given immediately after the interview than in the tests given just before the interview. In this experiment also, the difference between the pre- and post-interview scoring is higher in the first runs (t 3.76) than in the second runs (t 1.54). While 75.76% of the subjects obtained more hits in the *first run* of the post-interview session than in the *first run* of the pre-interview session, only 48.48% of the subjects scored more hits in the *second run* of the post-interview session than in the *second run* of the pre-interview session.

The results in this experiment, however, fail to confirm our previous finding that the nervous subjects tend to score higher on ESP tests than the confident subjects. One wonders whether the failure to replicate the previous finding may not be due to the new task the interviewer set for himself, viz., to discover his own assumptions concerning the confident and the nervous subjects. It is not unlikely that he became more self-conscious and was somehow unable to make appropriate ratings. There is of course the inherent difficulty in making any subjective estimates of this sort. Any further study of this dimension should employ a more objective criterion than the one we have used. Perhaps administering a standard personality inventory like the MMPI or the 16 PF might give us the relevant clues that would separate hitters from missers in a testing situation like this.

Results have also been analyzed in terms of the experimenters (see Table 25). As in the preliminary experiment, the scoring of the subjects tested by BK and PS is in the same direction. But the bulk of the difference between the post- and pre-interview scores is produced by BK's subjects. The results of both experimenters show that the subjects did better in the post-interview session than in the pre-

TABLE 25

SECOND REPLICATION EXPERIMENT

Pre- and Post-Interview ESP Scores with BK and PS

	BK as Experimenter						*PS as Experimenter*					
	Pre-Interview			*Post-Interview*			*Pre-Interview*			*Post-Interview*		
	1st Run	*2nd Run*	*Total*	*1st Run*	*2nd Run*	*Total*	*1st Run*	*2nd Run*	*Total*	*1st Run*	*2nd Run*	*Total*
Subjects	17	17	17	17	17	17	16	16	16	16	16	16
Runs	17	17	34	17	17	34	16	16	32	16	16	32
Hits	141	155	296	187	188	375	141	144	285	168	140	308
Deviation	—29	—15	—44	+17	+18	+35	—19	—16	—35	+8	—20	—12
Avg. per Run	8.29	9.12	8.71	11.00	11.06	11.03	8.81	9.00	8.91	10.50	8.75	9.63

interview session, and that the effect in both cases is more pronounced in the first runs than in the second runs.

BK tested 17 subjects and PS tested 16 subjects. BK's subjects obtained 296 hits in the pre-interview session with an average of 8.71 hits per run as compared to 375 hits in the post-interview session with an average of 11.03. The difference in the rate of scoring between the two sessions gives a t of 7.5, 16 d.f., $p<.001$ (see Table 26).

TABLE 26
SECOND REPLICATION EXPERIMENT
ESP Scores of BK's Subjects in Pre- and Post-Interview Sessions

N	*Pre-Interview*	*Post-Interview*
1	24	29
2	17	24
3	12	17
4	22	23
5	14	20
6	18	20
7	21	22
8	17	21
9	14	21
10	15	23
11	15	23
12	16	23
13	17	22
14	18	20
15	17	24
16	23	24
17	16	19

$t = 7.5$, d.f. $= 16$, $p<.001$

PS obtained 285 hits in the pre-interview session with an average of 8.91 hits, and 308 hits in the post-interview session with an average of 9.63. The difference in the scoring direction between the two sessions gives an insignificant t of 1.17 (see Table 27). Thus, the differential rate of scoring between the two sessions is more pronounced with BK's subjects.

When the first run scores of the first session are compared with the first run scores of the second session, it is seen that BK's subjects obtained 141 hits in the first run of the first session with an average

of 8.29 hits per run, and 187 hits in the first run of the second session, an average of 11.00 hits per run. A t test of the difference gives a t of 3.11, $p<.01$ (see Table 28). PS's subjects obtained 141 hits in

TABLE 27
SECOND REPLICATION EXPERIMENT
ESP Scores of Subjects in Pre- and Post-Interview Sessions with PS as Experimenter

N	*Pre-Interview*	*Post-Interview*
1	15	17
2	22	16
3	18	25
4	13	24
5	15	19
6	21	21
7	16	18
8	16	20
9	20	17
10	20	23
11	17	15
12	14	17
13	25	19
14	14	19
15	15	20
16	24	18

$t = 1.17$, d.f. $= 15$, NS

the first run of the first session with an average of 8.81 hits per run, and 168 hits in the first run of the second session with an average of 10.50 hits per run. The difference in the rate of scoring between the first runs of two sessions for PS's subjects gives a t of 2.06 (Table 29).

Then, for both experimenters the subjects showed a tendency to score more hits in the post-interview session than in the pre- interview session. This tendency is highly significant with BK as the experimenter but not so with PS. The overall difference between pre- and post-interview scores obtained by the latter runs in the same direction but does not reach the level of statistical significance. The

results of both experimenters reveal that the differential scoring between the pre- and post-interview sessions is more pronounced in the first runs than in the second runs. The mean difference between the first runs with BK as the experimenter is 2.71 as compared to 2.35, the mean difference per run when the first and second runs are combined. With PS as the experimenter, the mean difference between the first runs is 1.69 as compared to the overall mean difference per run of .72. It would seem therefore that while the differential scoring is much more pronounced when BK is the experimenter, the decline of this effect is much more apparent when PS is the experimenter.

TABLE 28

SECOND REPLICATION EXPERIMENT

First Run Scores of BK's Subjects in Pre- and Post-Interview Sessions

N	*Pre-Interview*	*Post-Interview*
1	9	14
2	9	11
3	5	9
4	15	8
5	11	12
6	8	10
7	9	10
8	12	11
9	9	9
10	6	11
11	6	8
12	7	15
13	8	14
14	5	10
15	7	15
16	8	11
17	7	9

$t = 3.11$, d.f. $= 16$, $p < .01$

Thus, even though the results obtained with BK and PS run in the same direction, they also suggest possible experimenter effects. It would seem that the differential scoring persisted with only a slight decline through the second runs when BK was the experimenter. It

TABLE 29

SECOND REPLICATION EXPERIMENT

First Run Scores of the Subjects of PS in Pre- and Post-Interview Sessions

N	*Pre-Interview*	*Post-Interview*
1	7	9
2	13	10
3	12	16
4	6	16
5	6	10
6	9	12
7	7	8
8	10	12
9	9	10
10	11	14
11	9	9
12	4	6
13	10	9
14	9	8
15	7	11
16	12	8

$t = 2.06$, d.f. $= 15$, $p \simeq .05$

seemed to have greatly declined from the first to the second runs when PS was the experimenter. Since the purpose of this study is not to test any possible difference between the results of the two experimenters, no attempt is made either to statistically test the difference, or hazard any guess to explain the differences at this stage of our discussion. We will have something to say on this in the final chapter.

V

FINDING THE CRUCIAL VARIABLE

From the results of the preliminary experiment and the two confirmatory studies, we can be reasonably confident that the subjects, when made to take an ESP test before and after a scheduled interview that would determine something important to them, tend to obtain more hits in the post-interview than in the pre-interview testing. In life situations such as those employed in these studies, the differential effect seems to be fairly consistent. The preliminary findings are replicated by the two consecutive studies. While the evidence for the differential effect has come from the studies of several investigators, prediction of the direction of differential scoring has been quite difficult. Rao's studies (1962, 1963)[96,97,98] with choice cards, reviewed in the first chapter, is a good example in this connection. The fairly identical conditions prevailing in the three experiments of this study and the highly motivated involvement of the subjects tested in a life setting are, it is believed, responsible for the consistency of the results.

The consistently superior performance observed in the post-interview over the pre-interview session raises the question: Why do subjects perform better after the interview than before? Before attempting to answer this question, it would be helpful to know whether the differential scoring is largely a result of psi-missing in the pre-interview session or is due to a strong psi-hitting tendency in the post-interview tests, or whether missing and hitting occurred more or less at the same level in the pre- and post-interview tests. This information might be helpful in locating the situation where psi had properly occurred either as psi-missing or as psi-hitting.

The results of all three experiments are given in Table 30 separately for the pre- and post-interview tests. The subjects did 161 runs of 50 trials in the pre-interview tests and an equal number of runs in the post-interview tests and obtained 1491 hits and 1741 hits respectively. The pre-interview runs give a deviation of —119. Such a deviation gives a CR of 3.32, $p<.001$. The post-interview runs give a deviation of +131 and a CR of 3.65, $p<.001$.

TABLE 30

Pre- and Post-Interview Scores in the First Three Experiments

	Pre-Interview				*Post-Interview*			
Experiment	*No. of Subjects*	*No. of Runs*	*No. of Hits*	*Deviation*	*No. of Subjects*	*No. of Runs*	*No. of Hits*	*Deviation*
Preliminary Experiment	22	43	424	—6	22	43	465	+35
First Confirmatory Experiment	26	52	486	—34	26	52	593	+73
Second Replicatory Experiment	33	66	581	—79	33	66	683	+23
Total	81	161	1491	—119	81	161	1741	+131
		CR = 3.32 $p<.001$				CR = 3.65 $p<.001$		

It is clear from these results that by and large the subjects' scores showed psi-missing in the pre-interview tests and psi-hitting in the post-interview tests to more or less the same degree. This in turn implies that we should look into both the pre- and post-interview situations for an answer to the question of why the subjects performed better in one than in the other.

One obvious inference based on these results is that this is a case of the differential effect, where the subjects, when made to work under two sets of contrasting conditions, manifested psi-hitting in one condition and psi-missing in the other. This observation fits in well with the findings of other investigators. For example, Rao's subject SH obtained significantly more hits in a hypnotically-induced relaxed state than in the state immediately preceding it (Rao, 1964).[99]

This implies that the positive scoring in the post-interview session

is stimulated by the negative scoring in the pre-interview one, and that the psi-hitting in the former is simply a bouncing effect. If this is the case, emphasis then would be on the pre-interview situation in explaining the reasons for the scoring trend in these experiments. One could say that it is the tension and anxiety experienced by subjects in such situations that are responsible for psi-missing in the pre-interview tests.

It is reasonable to assume that there existed in the subject a mental set or a mood, when he came for the interview, which in some significant way is different from the one prevailing after the interview. We could, for example, conceive the pre-interview situation as one in which the subject is relatively tense, anxious, and preoccupied with thoughts about the impending interview. Following the interview he might be more relaxed and passive. Also, once the interview is over, the only thing left for him to gain admission (or appointment) is to score high on the ESP test. This relaxed attention to the ESP task in the post-interview session and the tense-anxious mood prevailing in the pre-interview session might have been jointly responsible for the differential response in these studies.

It may also be argued that the subject in the post-interview session is prepared to take the ESP test because he was asked by the experimenter to return for another round of tests after the interview, whereas he had no time to prepare himself psychologically for the ESP test in the pre-interview session. The subject who was called for the interview did not know that he had to take the psychology test until he was asked to go to the experimenter's room. This did not leave him an opportunity to nerve himself up to the task. The subject who was looking forward to the interview might have considered the ESP test an imposition and might even have resented it. Thus the lack of psychological preparedness to take the ESP test and the primacy of the interview in the minds of the applicants might have been responsible for psi-missing in the pre-interview session.

In other words, the subject, who was called for the interview and had no idea that he would be asked to take a psychology test, had an interview set when he took the pre-interview ESP test. However, he may be said to have a set of test preparedness for the post-interview period because the experimenter told him about it when she first tested him in the pre-interview session. Thus, it may be

argued, the subjects who take the ESP test with an interview set tend to psi-miss while those who take it with a set of test preparedness tend to psi-hit.

Another explanation for the observed effect is that what occurred is not really a differential effect but a learning effect, i.e., subjects as they proceeded with the ESP test learned how to do it well so that the latter half of their performance is better than their performance in the first half. The main difficulty with this hypothesis is that ordinary subjects such as those who participated in these studies are not known to profit by learning. The bulk of evidence in the literature is in fact in favor of decline in scoring rate rather than in improvement of the scoring rate with practice. Both in ESP and PK research, chronological, vertical and horizontal declines are reported. These are reviewed by Rao (1966).[100] Subjects tended to show decline in their performance over time, also in the same session from the first runs to the last and in the same run from the first half to the second.

Tart (1966)[101] has convincingly argued that the reported declines are a consequence of the ESP testing situation which is more like an extinction paradigm than a learning paradigm. While it cannot be maintained that the present experimental technique, unlike other card-guessing experiments, resembles more a learning paradigm, one could argue that the learning effect may not be completely ruled out in the present studies, because these studies involve testing in life settings. In real life situations which heighten motivational involvement of the subjects, learning may take place.

Another possible hypothesis is that the experimenters, expecting the subjects to psi-miss in the pre-interview session and psi-hit in the post-interview session, could have unintentionally influenced the subjects in the way they handled and motivated them. Thus the differential response is no longer a situational effect but an experimenter effect, i.e., it is the experimenter and not the interview situation that is responsible for the effect obtained in these studies.

There is no way we can decide from the data available to us which of these hypotheses is the crucial one, even though one may find reasons to favor one over the others. For example, independently of these results there is no evidence that either of these experimenters could influence their subjects to score in a desired or expected direc-

tion. In fact our hypothesis, when we began these studies, is that the life setting would provide motivation to the subject that would overcome the effects of extraneous variables such as the experimenter, and thus give uniformity to the results.

It may be noted however that when we consider the results of the three experiments separately (see Table 30), we find that the first two experiments involving students seeking admission to the library science course show more psi-hitting and less psi-missing, while the third experiment, with applicants for employment, resulted in more psi-missing in the pre-interview test than psi-hitting in the post-interview test. Therefore, we might find the relevant clues for the differential scoring in the post-interview testing period of the student applicants and the pre-interview period of the job applicants.

Relatively more pronounced psi-missing in the third experiment with employment seekers (second replicatory experiment) during their pre-interview test and a similar psi-hitting tendency in the post-interview period of the other two experiments with students, seem more in line with the hypothesis which assumes the primacy of the interview in the minds of the applicants (interview set) and their psychological or cognitive preparedness to take the ESP test (set of test preparedness). The interview is definitely more important and consequential to the subjects in the third experiment than in the first two experiments. Also it is more likely that the students rather than the job seekers could have oriented themselves quickly to the ESP tests and apprehended their significance in the selection of applicants.

If this in fact is what has happened, then it should be possible to manipulate the subjects' scoring in a positive or negative direction before the interview by making the psychology test primary and the interview secondary, and by providing adequate advance notice to the subject and thus help to create in him a set of psychological test preparedness for the ESP test. With these assumptions and with a view to controlling the possible contaminating factors of the experimenters' anticipation and the learning effect, the following study was designed.

Procedure

The subjects in this study were students seeking admission to

the library science course and also to the M.A. psychology course. The circumstances relating to the admission and to the students seeking admission were not any different from those in the previous studies. KRR, who was then the head of both the departments of Library Science and Psychology, was responsible for the selection of students for admission to both these courses.

The experimental design not only provided for the control of the experimenter's anticipation and of the learning effect, but it also contained possibilities for understanding the role of the interview in producing the differential results during the pre- and post-interview testing. By testing the subjects in single sessions, instead of two, and by having a separate group of subjects for each of the experimental conditions, any possible learning effect is controlled. By keeping the experimenter blind about which group a subject belonged to, the possibility of the experimenter influencing the scoring direction of the subject was also controlled. By providing for three experimental groups, it became possible to test subjects before or after the interview and also to create a set of test preparedness, or otherwise, so as to determine their relative roles.

After preliminary screening on the basis of the grades they received in their undergraduate studies, the applicants for admission were assigned to three groups. Subjects in Group I, as were the subjects in previous experiments, were so treated that they were not expected to come with a set of test preparedness to take the ESP test, whereas the subjects in Group II and Group III were so treated that they were expected to come with such a set. But the subjects in Group II and Group III differed in that the former were interviewed after the ESP test, whereas the latter were interviewed first and then given the ESP test. The subjects in Group I received a letter from the Head of the Department which asked them to appear for an *interview* in connection with their application for admission. This letter, it was believed, would create an interview set in them. The subjects in the other two groups were sent a letter which told them they were required to take a *psychology test* in connection with their application for admission. Such a letter, it was hoped, would create in them a set of test preparedness. For each applicant a specific day and time were fixed for coming to the Department to take either the interview or the test. When the subjects of Group I arrived

for the interview they had been called for, they were told that they must first take a psychology test, and were administered the ESP test before they were interviewed. It was hypothesized that the results of this group would be similar to the pre-interview results of the previous experiments. The Group II subjects, who were called for the psychology test, were also first given the ESP test when they reported at the Department. It was believed that the subjects in this group would score in a way similar to that of the subjects in the post-interview test of the previous experiments. The subjects in Group III, who were also called for the psychology test, were first interviewed and then sent for the psychology test. The subjects in the first two groups were also interviewed after they completed their ESP tests.

The appointments were randomly made for all the subjects so that the experimenters would not know whether a subject was called for the interview or for the psychology test, or if he had already been interviewed. The experimenters were instructed not to ask the subjects any leading questions which would give them this crucial information concerning the group to which they belonged. This information was kept from everyone by KRR until all the tests were completed. It was believed that since the experimenters did not know to which group a subject belonged, they would not be able to influence the subject's scoring in a desired direction, even unintentionally. It was assumed, of course, that the experimenters would not solicit information bearing directly or indirectly on this. After the completion of the tests the two experimenters assured us that they did not know whether any of their subjects came for the interview or for the psychology test.

As soon as the subject came to the Department, the departmental secretary ascertained from KRR whether the subject was to be interviewed first or sent for the test. If the subject belonged to Group I or II, the subject was directed to take the psychology test first and was told that he would be interviewed after the test. He was then sent to the office of one of the two experimenters who gave the ESP test. If the subject belonged to Group III, he was conducted on arrival to KRR's office where he was interviewed. After the interview, he was sent to the office of one of the experimenters to take the ESP test.

Now, it was assumed that all the subjects called for the interview would come with an interview set and that that interview was of primary importance to them. By not giving them advanced notice of the psychology test, it was believed that they would be deprived of the necessary set of test preparedness. For the subjects who were called to take a psychology test, the psychology test, it was hoped, would be of primary importance and the interview secondary. These subjects would be likely to have a set preparedness for the ESP test. The subjects who came for the interview not knowing that they had to take a psychology test would have been least prepared psychologically for the test in comparison to those who came for the test itself. Therefore, if our assumption that the primary factor and the set of psychological test preparedness were responsible for the differential scoring was correct, we would expect the subjects who were called for the interview but were actually asked to take the ESP test before the interview to manifest a psi-missing tendency, and the subjects who were called for the psychology test and were given the psychology test first to show a psi-hitting tendency. Thus, we expected Group II to perform significantly better than Group I.

If, however, the assumed set of tension and anxiety about the interview was relevant to the subject's performance and not the set of psychological test preparedness, the Group II subjects would psi-miss. If the subjects in Group I as well as Group II manifested a psi-missing tendency, then it would have to be assumed that the act of participating in an interview, the mood of tension and anxiety generated by the impending interview, was somehow relevant to the subject's psi-missing in the pre-interview test. If this were so, the subjects in Group III who were first interviewed and then given the ESP test would show psi-hitting.

Group III was, therefore, constituted to see whether the subjects in this group would score positively even if the subjects in Group II failed.

The subjects in this experiment were applicants for library science and psychology courses. They were assigned to the three groups on a random basis, but with one reservation. No psychology applicant was assigned to Group I. The psychology applicants, it was believed, would be likely to differ in their attitude toward a psychology test from the library science applicants. They might not require

time for the creation of the required set. Even if they were called for the interview and not for the psychology test, still the psychology test might on its own acquire primacy over the interview. To avoid this contingency, no applicant for psychology was sent a letter calling him for an interview. All the psychology applicants were assigned randomly to either Group II or Group III and they were asked to come for a psychology test in connection with their application for admission.

Unlike the previous studies in which the subjects did *four* runs (50 trials) in *two* sessions, the subjects in this experiment did *two* runs in *one* session. Since each subject did only two runs and the total scores of the subjects in each of these groups were to be compared, the learning variable was rendered ineffective. If there were to be any learning effect, it would be common to all the groups. Since the experimenters did not know to which group the subject belonged, possible experimenter effect was also controlled.

BK and PS acted as the experimenters. Employing the blind matching procedure as described in the previous chapters, each of the subjects was given two runs with a deck of 50 ESP cards. The administering procedure and the instructions given to the subjects were precisely the same as in the previous tests.

On the basis of the results of the previous experiments, it was expected that the subjects in Group I who were tested before the interview would psi-miss and that those of Group III who were tested after the interview would psi-hit. In view of the assumptions we made concerning the crucial variables responsible for differential scoring, we predicted that the subjects in Group II would perform significantly better than the subjects in Group I.

Results

Thirty-nine applicants for library science turned up on the scheduled dates and took the ESP test and the interview. Only 11 applicants for the psychology course showed up and took the ESP test. A large number of psychology applicants did not come, and this resulted in a very small number for Group III.

The general results of all three groups are given separately in Table 31. There were 21 subjects in Group I, 23 in Group II and only 6 in Group III. The subjects in Group I obtained 397 hits

(—23) and averaged 9.45 hits per run of 50 trials. The Group II subjects scored 494 hits (+34), an average of 10.74 hits per run. A t test for the difference between the mean scores of the subjects in Group I and Group II gives a t of 2.15, $p<.05$ (see Table 32). This confirms the expectation that subjects in Group II would perform significantly better than the subjects in Group I, i.e., the subjects who took the ESP test with the set of test preparedness perform better than those who took the test without such a set.

TABLE 31
CRUCIAL EXPERIMENT
ESP Scores of the Four Groups

	Interview set	*Set of Test preparedness*		
	Group I	*Group II*	*Group III*	*Groups II & III combined*
Subjects	21	23	6	29
Runs	42	46	12	58
Hits	397	494	132	626
Deviation	—23	+34	+12	+46
Avg. per Run	9.45	10.74	11	10.79

The 6 subjects in Group III obtained a total of 132 hits (+12) and averaged 11 hits per run. Their average run score (11.00) was even slightly higher than that of the subjects in Group II (10.74) who were also called for the psychology test. Unfortunately the number of subjects in Group III was too small to make any meaningful comparison with other groups. But it may be noted that the subjects in Group II and III, i.e., the subjects who were called for the psychology test, together obtained a positive score which is significant. In a total of 58 runs of 50 trials, they obtained 626 hits, a deviation of +46. This gives a CR of 2.14, $p<.05$. This result clearly suggests that if the applicant is called for a psychology test, and then given an ESP test he would tend to score positively. This seems to be true whether he is interviewed before the test or not. The assumed state of tension and anxiety about the impending interview at the time of pre-interview testing cannot therefore be an adequate explanation for psi-missing in the pre-interview tests of our previous experiments.

While in the previous experiments the positive scoring in the

TABLE 32

CRUCIAL EXPERIMENT

ESP Scores of Subjects in Group I and Group II

N	*Interview*	*N*	*Psychology Test*
1	23	1	25
2	29	2	18
3	21	3	19
4	24	4	26
5	16	5	18
6	24	6	21
7	20	7	18
8	14	8	20
9	14	9	27
10	10	10	18
11	20	11	21
12	15	12	21
13	18	13	26
14	22	14	20
15	21	15	21
16	17	16	18
17	13	17	21
18	19	18	25
19	19	19	17
20	17	20	17
21	21	21	24
		22	28
		23	25

$t = 2.15$, d.f. $= 42$, $p < .05$

post-interview tests could have been simply a differential response, the positive scoring in this experiment could not be an aspect of the differential effect, because each subject worked only in one condition and there was no opportunity for him to register differential scoring. Therefore, it is quite likely that the variables we have manipulated by calling the applicants for the interview or the psychology test were crucial and that the subject's scoring direction was not related directly to the pre-interview or post-interview mood of the subject, but to the set of test preparedness or to the interview set of the subject. The primacy of the interview or the psychology test in the minds of the subjects as generated by the departmental communication was thus a relevant factor.

VI

CONCLUSION

The attempts in these studies to test subjects in real life situations involving needs that are important to them have been successful to the extent that significant relationships betwen situational and subject variables on the one hand and ESP scores on the other have been found. It is apparent from the results that these relationships fit into the categories already established by the ESP tests that did not involve similar life situations. As in the laboratory tests with volunteer subjects, both psi-hitting and psi-missing occurred in these tests. Some subjects were found to psi-hit and some others to psi-miss. Also, the same subjects tended to psi-hit in one situation and psi-miss in another. Thus our assumption that a life situation, whatever be its motivational potential, does not of itself guarantee positive scoring seems to be justified. Enhancing motivation is like increasing pressure. The direction from which the pressure is released is something that is likely to be determined by other variables which include the personality of the subject, the test situation and the subject-experimenter relationship.

Are we also justified in our assumption that the life situations of the sort employed in these studies help to produce more consistent results than is usual with laboratory testing? At this stage the answer can only be a qualified "yes."

Regarding the relationship between "confident-nervous" rating by the interviewer and ESP scoring of the subjects, the results have not been consistent. While the initial study promised a highly significant relationship, statistically, the second experiment barely confirmed it at the .025 level of significance and the third one com-

pletely failed. We are, however, inclined to think that the lack of a high degree of consistency in these results is very likely due to the vagaries of subjective judgment involved in our rating procedures. We are tempted to recommend that any future study should involve objective tests of personality such as the MMPI which in our opinion would help in finding more consistent relationships. Our clinical observation is that the life situation presents a highly promising avenue for separating hitters and missers in psi tests on the basis of personality parameters. If these studies have not accomplished this, it is largely due to the fact that the focus of our interest has been on the situational variable, viz., pre- and post-interview effects on subject's scoring. The interview ratings have been only the peripheral interest and therefore the leads we have obtained have not been intensely probed. This will have to wait for another study.

Assuming that there is some relationship between the apparent nervousness of the subject in the interview situation and his ESP scoring as evidenced in the first two experiments, one may be tempted to look for its possible reasons. This would enable us to focus on the relevant variables in future studies.

That the MAS scores did not show any relationship to ESP scores clearly rules out anxiety as the possible factor. The "nervous" subjects did not manifest significantly greater anxiety as measured by the MAS than the "confident" subjects. While discussing the results in Chapter IV, we suggested that what is involved is a motivational factor and that the subject who appeared to be nervous was one who desired admission more intensely than the one who appeared to be confident. It is not likely that every one intensely desiring admission manifests nervousness. The apparent nervousness may be a function of both the intensity of motivation and some other aspect of the subject's personality. Therefore, in any future study it is recommended that a comprehensive personality test with a scale designed to measure subject's motivation relevant to the life setting be administered, and the experiment be so designed as to study the interaction of motivation and the personality characteristics of the subjects in relation to their ESP scoring.

The differential scoring between pre- and post-interview testing has been remarkably consistent. In all three experiments in which the same subjects were tested before and after the interview, the

subjects showed a significant tendency to obtain more hits during the post-interview test than in the pre-interview test. Also, in all three experiments the difference in the rate of scoring between pre- and post-interview tests was greater in the first runs than in the second runs. What is even more satisfying is that we were able to manipulate the variables in the fourth experiment so as to cause positive scoring in the pre-interview testing under conditions where the experimenters are blind to the treatment condition of their subjects. This kind of consistency is something that we do not frequently encounter in ESP research.

There have been quite a few instances of individual subjects consistently performing well over a period of time, such as Pearce (Rhine, 1935; Rhine and Pratt, 1954),[102,103] Shackleton and Stewart (Soal and Goldney, 1943, 1944),[104,105] and Stepanek (Ryzl and Pratt, 1962, 1963).[106,107,108,109] But in experiments involving groups of unselected subjects where relationships between ESP and other variables were sought to be established, multiple replications are lacking except in a very few studies like those of Schmeidler (Schmeidler and McConnell, 1958),[110] Anderson and White (1956, 1957, 1958),[111,112,113,114,115] and Kanthamani (1968).[116]

That this consistency of results is necessarily a consequence of the life situations we employed has yet to be established. The significant differences obtained by Kanthamani (1968) in the ESP scores of her subjects with high and low neuroticism scores are equally consistent and strong. But her subjects were not tested in life situations. All that one could claim for the present studies, then, is that they have shown how ESP tests could be built around life situations, and that testing in life situations could enable one to obtain consistent results.

It should also be pointed out that the rate of scoring in these experiments is by no means phenomenal. The average run scores in the pre- and post-interview sessions are 9.26 and 10.81 respectively, where the MCE is 10. These averages are impressive, but do not guarantee that life situations enable superior performance in terms of better averages. While acknowledging this, we should not fail to notice a very significant difference between ESP in the laboratory and ESP in life which was not incorporated into these studies.

The difference is in the testing technique employed in these

experiments. It is a routine laboratory technique and does not provide for spontaneity or a state in which the unconscious could influence the subject's response.

There is some evidence leading us to believe that psi is an unconscious process. In many of the spontaneous psi experiences the information seems to manifest in a state of altered consciousness where the unconscious is more likely to influence behavior (Rhine, 1953).[117]

"The most significant and revealing characteristic of psi," wrote J. B. Rhine (1953),[118] "is that its operation is entirely unconscious." (P. 108). If psi communications are received at the unconscious level, then, they seem to need a mechanism by which they can find their way to consciousness. Tyrrell (1947)[119] called them the mediating vehicles. According to Tyrrell, the mediating vehicles are the tools by which the unconsciously received ESP is externalized in consciousness. These mediating vehicles do not seem to be very different from the mechanisms that manifest in what are now known as altered states of consciousness. The life situations, as opposed to the laboratory situation, seem to provide opportunities for an alteration of consciousness to occur.

INR's experience, which is given in Chapter I, came in the form of a vision. A number of spontaneous cases are reported to occur in dream states. As Rao (1966)[120] has shown, the four forms of spontaneous psi experiences described by L. E. Rhine (1961)[121] also seem to be other types of mediating vehicles. It is likely that, if ESP information is first obtained at the unconscious level, the forms in which it manifests may be similar to the ways in which unconscious impulses, motives and memories find expression in consciousness. Rao (1968)[122] has also shown how ESP may manifest in the form of experimental errors in a way similar to the slips of the tongue as interpreted in Freudian psychology.

Generally, in the laboratory situation the subject works in a normal state of consciousness with no possibility of a mechanism that would play the role of a mediating vehicle. If distortions occur, they are likely to manifest in the form of displacements, consistent missing and the like, which are very different from the symbolic transformations that are found in hallucinations, apparitions or dream states. The recent success of the Maimonides team in their dream-telepathy studies (Ullman and Krippner, 1970)[123] may be

largely due to their effort to employ the facilitative dream state for the reception of telepathic information.

One could argue that the unconscious psi is under constant surveillance and repression because of a built-in defense mechanism that protects us from the multitude of mind to mind communications. It is only occasionally, when the defense is relaxed or when the pressure of the repressed psi event increases, that it thrusts itself into consciousness in a disguised, symbolic or distorted form. An altered state of consciousness such as a dream may facilitate the emergence of unconscious psi information into consciousness. The most significant aspect of the Maimonides study consists, it would seem, in bringing the laboratory situation closer to the life situation by allowing (a) for a mediating vehicle (dream) to operate, and (b) for the ESP to manifest more or less spontaneously. Any volitional effort is likely to meet with the arousal of the natural defenses against psi. Therefore, it is believed that future studies involving life situations would greatly benefit from the incorporation of techniques that allow for the natural mediating vehicles to operate.

One could justifiably ask, under the circumstances, whether a technique involving free-response material would not have been more appropriate than the card guessing technique. This is certainly something one should keep in mind. It is a belated realization on the part of this investigator that suitable free-response methods should be employed for testing in life situations.

Two other suggestive findings that came to light in the course of these experiments are (1) the differential effect between two language words does not occur when the subjects are familiar with both language words; and (2) even in life situations the experimenter is an important variable.

The first experiment in which language ESP cards were used gave no evidence of differential effect between Telugu and English targets. Also, no sex differences as reported by Rao (1963)[124] were found. In Rao's studies, while the boys consistently scored more hits on Telugu targets than on English targets, the girls obtained more hits on English targets. Of course one would be hesitant to draw any conclusions from negative results, i.e., results indicating no relationship. But our conclusions can be justified also on the ground that a couple of other unpublished studies made at the Department of Psy-

chology and Parapsychology of Andhra University also failed to obtain any evidence of differential response with two language cards when the subjects were familiar with the two languages.

This finding, which is only incidental to this study, is quite important for it enables us to speculate on conditions that are necessary for the occurrence of the differential effect. The fact that the American subjects have consistently scored differentially on the Telugu-English language cards, coupled with the finding that the subjects at Andhra University failed to manifest a similar tendency, clearly suggests the importance of contrast between the two conditions in the minds of subjects. For the subjects at Andhra who are familiar with both languages, there could be very little contrast or opposition, whereas for the American subjects Telugu is a language of the "exotic" East, whose characters are perceived to be very different from those known to them in other languages. Thus, one could assume that the sharper the contrast between the conditions, the greater the differential effect.

There are a number of studies in the literature where some experimenters are found to be more successful in eliciting psi than others. To mention a few, MacFarland (1938),[125] Pratt and Price (1938),[126] West and Fisk (1953-54)[127] and Osis and Dean (1964)[128] have reported significant differences in a subject's scoring with different experimenters. The series of experiments reported here were not designed to study any experimenter differences. In fact the assumption has been that the heightened motivational involvement of the subjects working in a significant life situation would render such other variables as the experimenter less effective. But the results have indicated that the differential scoring between the pre- and post-interview tests was more pronounced with one experimenter (BK) than with the other (PS). Also the decline of the effect from the first to the second runs is greater with PS than with BK.

To make these points clear, the combined average run scores of the subjects in the first three experiments, in which the same subjects were tested before and after the scheduled interview, are given separately for the two experimenters in Table 33. These results are also plotted on graphs I to IV to depict the way subjects scored with the two experimenters. Graph I shows an incline in the ESP scores of the subjects from the first to the second run in the pre-interview session

and a decline in the ESP scores from the first to the second run in the post-interview session. Graph II reveals the same tendency with each of the experimenters.

TABLE 33

Average Run Scores Obtained by BK and PS in Pre- and Post-Interview Tests of the Three Experiments Combined

		Pre-Interview			*Post-Interview*		
Experimenters	*N*	*First Run*	*Second Run*	*Total*	*First Run*	*Second Run*	*Total*
BK	55	8.78	9.56	9.17	11.58	10.85	11.22
PS	26	8.81	10.12	9.45	10.42	9.44	9.94
TOTAL	81	8.79	9.74	9.26	11.21	10.41	10.81

As may be seen from Graph III, the results of the three experiments show that the differential scoring between the first runs of the pre- and post-interview tests is greater than in the second runs. Graph IV depicts how the decline of the effect varied somewhat with the two experimenters. It can also be seen that a greater part of the difference in the results obtained by the two experimenters is accounted for by the subject's performance during the second runs. As far as the first runs are concerned, the difference between the two experimenters is small.

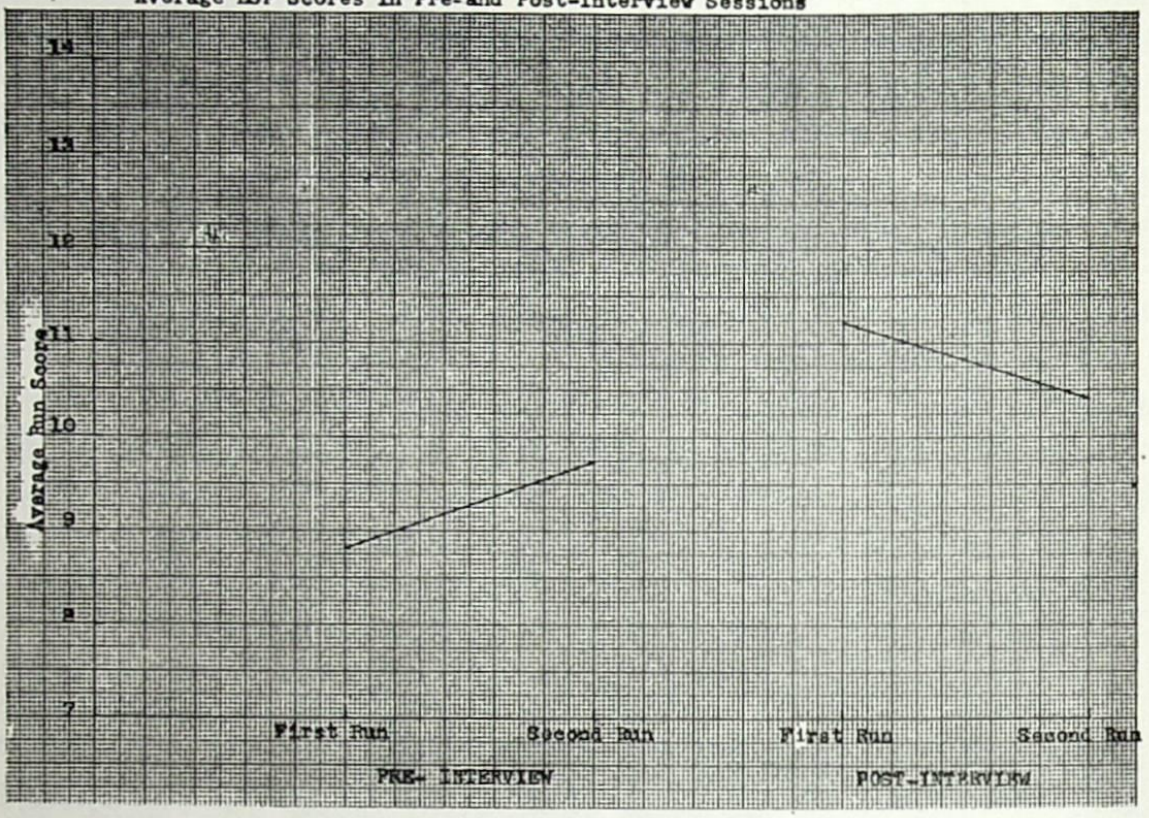
What is, therefore, interesting is that the effect in the first runs is quite marked and similar for both the experimenters. It is in the first runs that the effects of the pre- and post-interview testing are supposed to be maximal, because it is during that part of the testing that the interview set and the set of test preparedness are likely to be more active.

For both BK and PS, (a) the subjects obtained more hits in the post-interview session than in the pre-interview session, and (b) the differences between pre- and post-interview scores declined from the first runs to the second. But the former is more apparent in the results obtained by BK and the latter in the results of PS.

This is not the first time a decline in the differential effect is observed. In his very first study of what he then called the "pref-

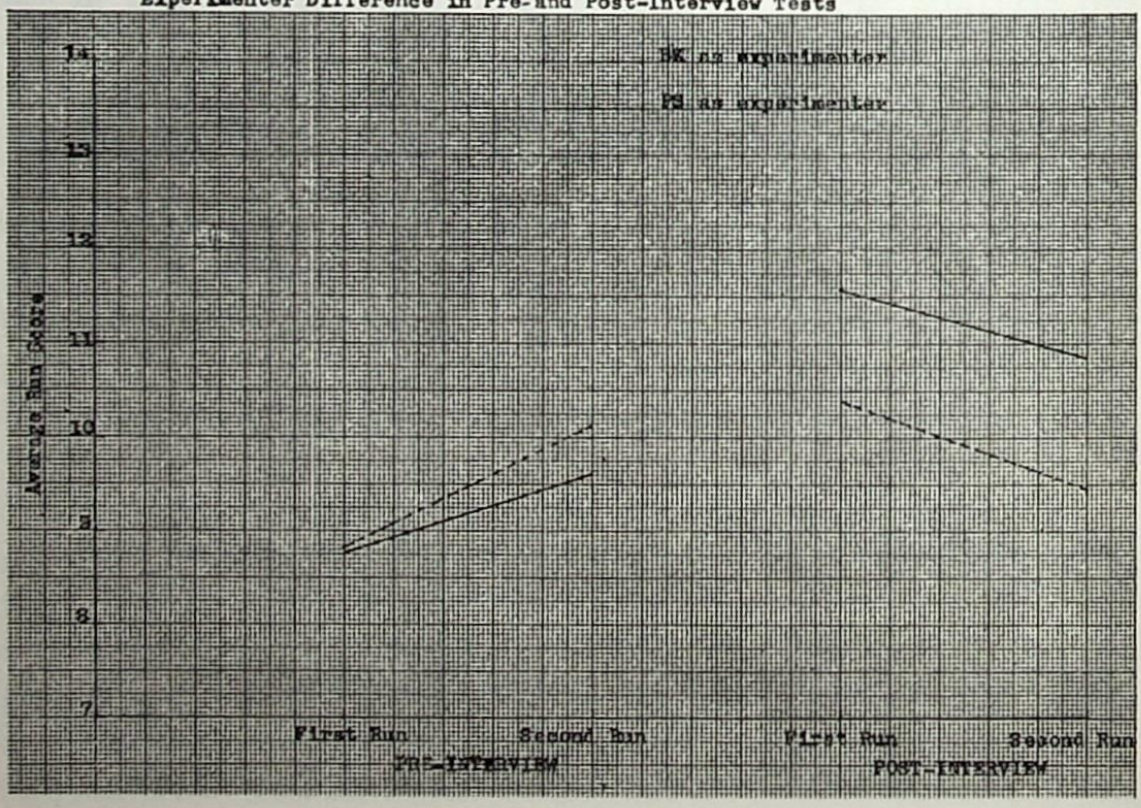
GRAPH I

Average ESP Scores in Pre-and Post-Interview Sessions



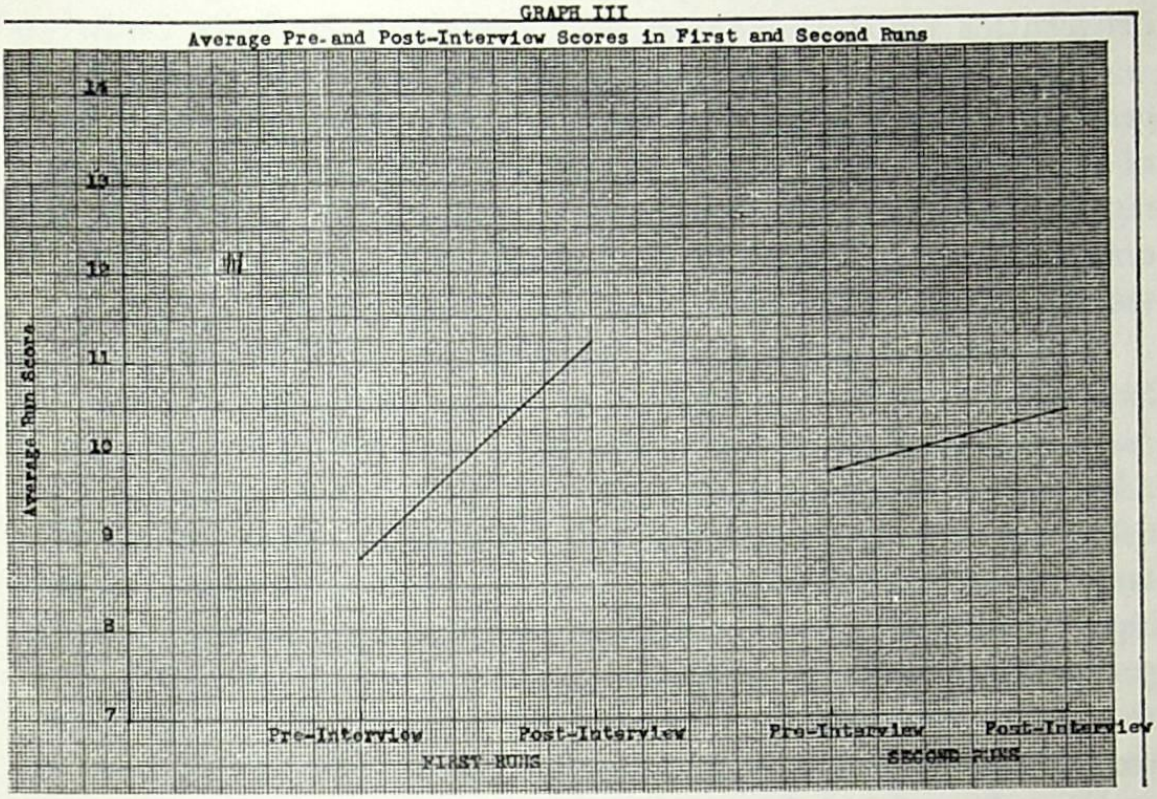
GRAPH II

Experimenter Difference in Pre-and Post-Interview Tests



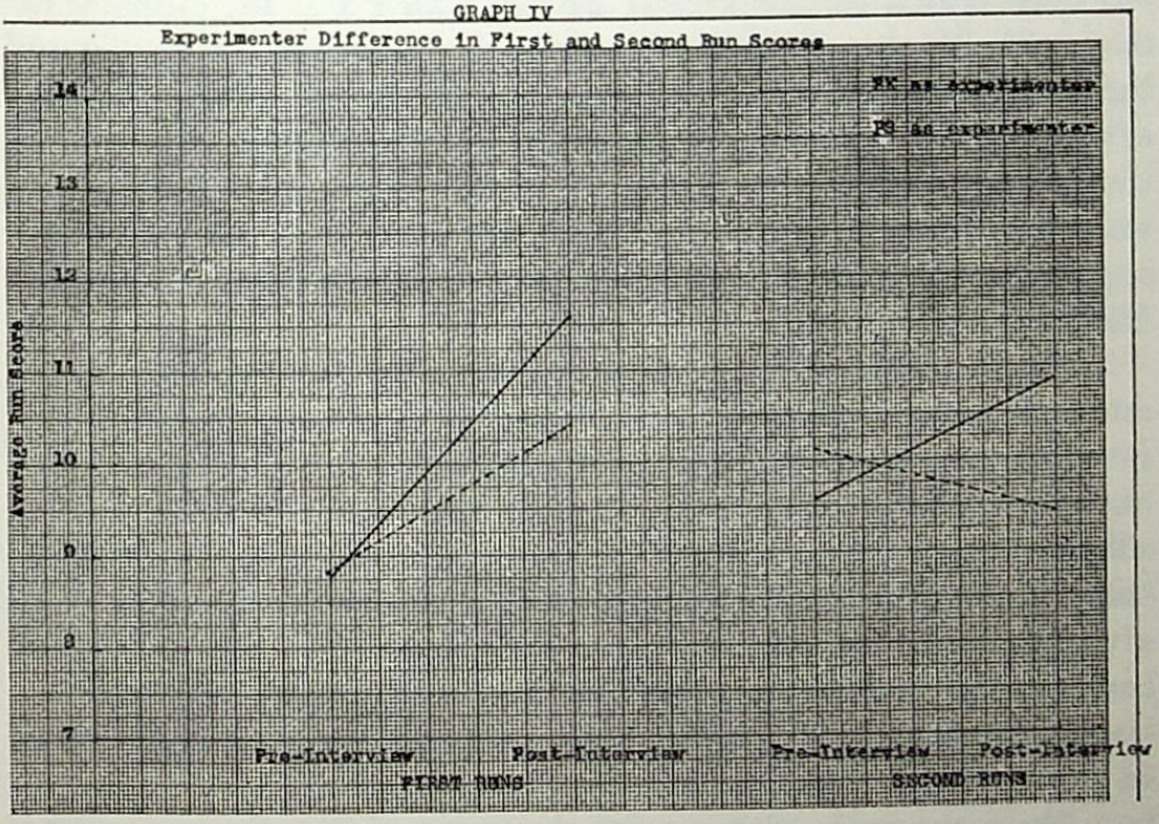
GRAPH III

Average Pre-and Post-Interview Scores in First and Second Runs



GRAPH IV

Experimenter Difference in First and Second Run Scores



erential effect," Rao (1962)[129] observed a decline in the difference between his subjects' scores on ESP cards and on choice cards.

The decline is interesting for two reasons. First, it fits into the general pattern of ESP. As it has been pointed out earlier, a number of investigators observed declines in their ESP data and have come to regard declines as one of the ways in which psi manifests itself. Second, it throws some light on the conditions that may be necessary for the occurrence of the differential response.

A possible explanation for the decline of the differential response from the first to the second runs is that the pre-interview set as well as the post-interview set in the subjects underwent a transformation, a change or became less effective with the progress of the test. The subjects got themselves, one could say, more involved with the ESP task and less concerned with the interview and its outcome. A loosening of a subject's mental set from the first to the second run in the pre-interview period would mean the lessening of the effect of the thought of the impending interview on his performance. In the post-interview test, again, it would mean the subject's failure to sustain the same set for continued successful performance.

The reason for the greater decline with PS as the experimenter than with BK may be found in the extent to which the handling of the subjects by these experimenters had contributed to the loosening of the subjects' mental set as they proceeded with the test. It is likely that BK's handling of the subjects caused little change in their mental set or mood whereas the way PS handled her subjects caused loosening of the set with which they came, as they proceeded with the ESP test.

Rao's explanation for the decline of the preferential effect among his subjects is similar. He (1962)[130] argued that the symbolic meaning associated with the symbols inscribed by the subjects on the choice cards might have been lost with the progress of the tests. The subjects' emotional response to them may have declined. The subjects, therefore, responded alike to both the ESP cards and the choice cards after the latter lost their apparent significance. In other words, the contrast between the two sets of targets, so essential for the differential response to occur, might have progressively become less sharp in the subjects' minds.

Now, the main objective of the series of experiments reported

here is to explore the differential response between pre- and post-interview ESP tests in a life setting that is of some prime importance to the subject. The important finding of these studies is that the subjects have shown a consistent tendency to psi-miss in the pre-interview tests and to psi-hit in the post-interview tests. The studies have also given us some insights into the factors that are possibly related to the observed tendencies of hitting and missing. What are these insights? What is their relevance to our understanding of the nature of ESP in general and the differential effect in particular?

What is it in the pre-interview test that is conceivably related to subjects' psi-missing? The possible role of the experimenter is ruled out by the final study, where the experimenters were blind to the treatment conditions of the subjects. As discussed in the preceding chapter, the alternatives are: (1) That the subjects before the interview were in a mood of tension and anxiety relating to the interview, and (2) that they did not have a set of test preparedness. These two are not really alternatives in the sense that the subjects had one or the other. It is likely that they did not have the set of test preparedness and that they were also in a state of tension and anxiety. They are alternatives in the sense that they are possible explanations to the psi-missing tendency observed in the pre-interview tests.

The results of the crucial experiment are clear in their implication that the tension hypothesis is not sufficient to explain psi-missing. The subjects in Group II, as with those in Group I, should have experienced the same tension about the interview because they were also directed to come back for the interview after the psychology test. But the results show that the subjects in Group II, unlike the Group I subjects, tended to psi-hit. The only relevant difference between Group I and Group II is that the latter came with a mental set to take the psychology test (a set of test preparedness) whereas the former came with a set to appear for the interview (an interview set). Therefore, the set of test preparedness seems to be necessary for the subjects to score positivly on an ESP test administered in a life situation.

However, the hypotheses of test preparedness and tension need not be necessarily considered as alternatives. They may also be regarded as complementary. It may be assumed that the subjects who were called for the interview had come with an "interview set" and

the interview therefore became primary to them, and that the subjects who were called for the psychology test had come with a set of test preparedness and the psychology test became primary to them. Those who came with the "interview set" when asked to take a psychology test could have experienced tension because the interview was primary to them and they attached special significance to it in their mind. On the contrary, the subjects who came with a set of test preparedness would have experienced no such tension because to them the test was primary and not the interview. Thus, it could be seen that the set of test preparedness has a function of creating a state of mind conducive to positive scoring, whereas the interview set arouses tension and anxiety when the subjects are sent for the psychology test before the interview. Tension and anxiety in turn may lead to psi-missing.

It appears reasonable, therefore, that the set of psychological preparedness is necessary for positive scoring. The lack of such a set and the tension and anxiety caused by the interview set may cause psi-missing. The two contrasting conditions of the differential situation in these experiments, then, are the two sets, viz., the set of test preparedness and the interview set.

It is an interesting theoretical question whether the differential effect would manifest only when there are two contrasting conditions or whether it would also occur in a situation where a condition is present at one time and absent at another time. Suppose, for instance, that a subject manifests a differential response between two observers by scoring positively when one observer is present and negatively when the other is present. Would the subject also score negatively when the first observer is not present or positively when the second observer is absent? In other words, what is the role of the second condition in producing a differential response?

In the context of the present study, one may wonder whether simple absence of the set of test preparedness would have caused psi-missing? This question cannot be answered from the data available. The life situation utilized in these studies was inextricably bound with the interview and therefore the interview necessarily became one of the conditions. It would be worthwhile to pursue this idea further in future studies because, to the knowledge of this investigator, there is no published report in which this question is raised and answered.

Any knowledge about this would enrich our understanding of the differential effect.

Why is the differential effect so frequently observed? Is it because it involves a methodological improvement when we bring together conditions that contrast so that detectable differences in scoring rate are found? Or is it because it involves an intrinsic aspect of psi? Rao (1965)[131] seems to favor the latter hypothesis. If the differential response is, as Rao contends, a built-in defense mechanism, normally every successful psi-operation would be accompanied by a missing response and psi would become unreliable and therefore fall into disuse. This hypothesis assumes that there is something like a psi homeostasis in us, a necessity to balance between hitting and missing. Differential response, as studied in the laboratory, then, involves a design that accounts for both the missing and hitting responses and thus maintains the homeostasis.

The alternative hypothesis makes no such assumption. The differential response is simply a *conjunction* of hitting and missing prompted by two sets of conditions that favor positive and negative scoring. If this hypothesis is correct, the differential effect would occur only when the subject is working under two contrasting conditions, contrasting conditions defined as conditions contributing to psi-hitting and psi-missing. If, on the contrary, the first hypothesis is correct, the differential effect would also manifest when one of the conditions contributes to hitting or missing while the other is a neutral condition, or simply when the first condition is absent. In this hypothesis, for instance, the absence of the set of test preparedness should cause psi-missing whether or not the subject has an interview set.

From the results of our studies, it cannot be said which of the two hypotheses is justified. The fact that both the interview set and the set of test preparedness are found to be related to the subject's performance favors the "conjunction" hypothesis without ruling out the "homeostasis" hypothesis.

In summary, then, the main finding of these studies is that the subject tends to psi-miss in a pre-interview ESP test and psi-hit in the post-interview test when the interview relates to something important to him. This differential scoring seems to be related to the interview set and to the set of test preparedness in the subject's mind. If the subject has an interview set when he takes an ESP test, he tends to

psi-miss. Also, the subject shows a tendency for psi-hitting if he takes the ESP test with a set of test preparedness in a situation where a good ESP score is associated with possible success in a significant life situation.

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