

ESP in Relation to Cognitive Development and IQ in Young Children^{1, 2}

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ABSTRACT: A total of 92 children between the ages of four and seven were tested for ESP in two studies using five colors of M&M's candies as targets, with immediate feedback after each trial. In the first study, 42 children were tested for level of cognitive development using Piaget's Conservation of Liquids Test. Children classified as "mixed"—i.e., making both "prelogical" and "logical" responses—obtained significantly positive ESP scores ($P < .02$, two-tailed), while those in the "logical" and "prelogical" groups scored at chance. Twenty-seven of the children were tested in their own or in neighbors' homes and the remainder in a school situation. Those tested at home obtained significantly positive ESP scores ($P = .03$, two-tailed) and those tested in a school situation scored insignificantly below chance. The difference in scoring level between these two groups is significant ($P = .03$, two-tailed). In the follow-up study 50 children were tested at home and were given the Peabody Picture Vocabulary Test for IQ in addition to the Piaget test. This study did not replicate the results of the first since none of the three cognitive categories showed significant ESP scoring. The results of the Peabody, however, showed that high IQ children obtained significantly higher ESP scores on the second run than on the first ($P = .01$, two-tailed). The incremental increase in scoring from first to second run for the high and low IQ groups combined was also significant ($P = .01$, two-tailed). These findings indicate a possible connection between ESP and IQ, with implications for imaging ability.

INTRODUCTION

There have been numerous studies of ESP in children tested either in the classroom or individually, and most of them have indicated that the factors which affect scoring level in adults, such as experimenter attitudes (Anderson and White, 1958) or sheep-goat divisions

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(Musso, 1965), also affect children. When studies have shown that young children may be *more* successful in ESP guessing tasks than adults (Bottrill, 1969), the results have usually been ascribed to attitudinal and motivational factors rather than to differences in cognitive organization in children and adults.

Ehrenwald (1971) states that ESP shows "all the characteristics of Freud's primary process functioning; of symbolic representation; of prelogical, paleological, or of Piaget's preoperational thinking and reasoning" (p. 460)—in other words, childlike thinking. According to Piaget, a major change in cognitive organization occurs roughly between the ages of five and seven. The earlier form of cognitive organization is referred to by Piaget as "preoperational" or "prelogical" and is characterized by the young child's tendency to deal with things one aspect at a time in terms of their perceptual appearance. Piaget refers to the later form of cognitive organization as operational or logical since it involves the ability to deal with sets of features several at a time in a structured relationship (Bruner, Oliver, and Greenfield, 1966).

This report describes two preliminary explorations of ESP in young children. Piaget's Conservation of Liquids Test was used in both studies to test the child's level of cognitive development. We wished to see whether this would be relevant to success in ESP scoring, hypothesizing that children in the "prelogical" group would score significantly better than those in the "logical" group. This hypothesis was not confirmed; a "mixed" group of children who made some "prelogical" and some "logical" responses was the only group that obtained significantly positive ESP scores. In the second study, the Peabody Picture Vocabulary Test for IQ was added to the Piaget Conservation of Liquids Test to give us an additional measure of the child's cognitive level. High IQ children generally show "logical" or "mixed" responses on the Conservation Test earlier than others in their age group do. Because of the possibility that IQ was the factor affecting ESP scoring rather than conservation category, we wished to see if the children in the "mixed" group had higher IQs than those in the "prelogical" group. The ESP task chosen as appropriate for our subjects was a "guessing game" using M&M's candies.

EXPERIMENT I

Subjects

Subjects were 42 children between the ages of four and seven, about evenly divided in terms of age and sex, recruited on an unpaid, volunteer basis from among friends and neighbors of the

experimenters. Twenty-seven of the children were tested in their own homes or in the homes of neighbors; 15 were tested at a nursery/daycare center that agreed to cooperate. All the children lived in New York City and came from a variety of socio-economic backgrounds.

Procedure

ESP task. In order to provide an ESP task which would be motivationally appropriate for young children, we borrowed an idea from an old TV commercial for M&M's candies ("In which hand are the M&M's?"). The targets were 100 M&M's, 20 of each of five colors, thoroughly mixed in a brown paper bag. The child's task was to guess which color the experimenter would draw out of the bag immediately following the guess. If the child guessed the correct color, he or she was allowed to pick an M&M of the same color out of an identical bag, to eat immediately or to save until later. Each subject completed two 25-trial runs, with immediate feedback after each guess. The experimenter wore a cotton glove to eliminate any possible tactile cues as she reached into the bag to select each target M&M. Following each trial, the target M&M was replaced in the bag. The candies in the bag were mixed up again after each five-trial segment of the run. The target bag was placed in such a way that neither the experimenter nor the subject could see into it, much less the bottom of it where the M&M's lay. The child's guess was recorded before the experimenter reached into the bag and the target M&M's color was recorded, as soon as it was pulled out of the bag, in a separate column of the record sheet. If correct, it was circled. The total number of correct responses was counted at the end of the experimental session, and later independently checked by another experimenter.

Conservation test. Immediately following the ESP test, the subject was given Piaget's Conservation of Liquids Test. The child was shown two 50 ml beakers with the same amount of water in each. The water from one was then poured into a 25 ml graduated cylinder and the child was asked if it was the same amount as the water remaining in the first beaker. The water was then poured from the 25 ml graduated cylinder into a 15 ml cylinder and the child was asked if it was the same amount as in the first beaker. Finally, the water was poured into six whiskey glasses and the child was again asked if there was the same amount as in the first beaker. Then the children were divided into three groups—"prelogical," "logical," and "mixed"—on the basis of their responses.

Results

The overall ESP run score mean was 5.42 ($t < 1$, 41 *df*), which is nonsignificant. The 21 children classified as unambiguously "prelogical" obtained an ESP mean of 5.05, which is also nonsignificant. Six children were classified as unambiguously "logical" and obtained a mean scoring rate of 5.83; because of the small *N*, this is not significant ($t = 1.24$). A total of 15 children were classified as "mixed," having made some responses which were "prelogical" and others which were "logical." This "mixed" group obtained significantly positive ESP scores, with a mean of 5.77 ($t = 2.64$, 14 *df*, $P < .02$, two-tailed). The data are summarized in Table 1.

Table 1

ESP SUCCESS IN RELATION TO PIAGET'S COGNITIVE STAGES,
EXPERIMENT I

Cognitive Stage	N (Ss)	ESP Mean	<i>t</i>	<i>df</i>	<i>P</i> (2-tailed)
Prelogical	21	5.05	<1.00	20	n.s.
Logical	6	5.83	1.24	5	n.s.
Mixed	15	5.77	2.64	14	< .02

Internal consistency of scoring (correlation between first and second runs of each subject) was not significant, though tending to be positively related to cognitive level: "Prelogical" $r = -.09$ (19 *df*, n.s.), "mixed" $r = +.17$ (13 *df*, n.s.), "logical" $r_s = +.67$ ($N = 6$, n.s.).

We also examined the children's ESP success in relation to environment. Twenty-seven were tested in their own homes or in the homes of neighbors and 15 in the school situation. Those tested at home obtained a significant ESP mean of 5.74 ($t = 2.34$, 26 *df*, $P = .03$, two-tailed). The children tested in the school situation obtained a nonsignificant ESP mean of 4.83. The difference in ESP success between children tested at home or in the school situation is significant ($t = 2.28$, 40 *df*, $P = .03$, two-tailed). These findings are summarized in Table 2.

EXPERIMENT II

Because the data from Experiment I are consistent with Pratt's (1961) suggestion that subjects tested in familiar environments are

Table 2

**ESP SUCCESS IN RELATION TO TESTING ENVIRONMENT
(HOME/SCHOOL), EXPERIMENT I**

Testing Environment	N (Ss)	ESP Mean	t	df	P (2-tailed)
Home	27	5.74	2.34	26	.03
School	15	4.83	<1.00	14	n.s.
Home vs. School.....		+ .91	2.28	40	.03

more likely to produce significant results than those tested in strange surroundings, we decided when planning this follow-up study to work with all the subjects in their own homes. The Peabody Picture Vocabulary Test (PPVT), which gives an IQ measure on verbal ability, was added to the Piaget Conservation of Liquids Test for more information about each child's cognitive level. An additional change of procedure involved the use of two experimenters, one to give the ESP test and one to give the Conservation Test and the PPVT. On the basis of the results on the Conservation Test in Experiment I, we hypothesized that children in the "mixed" group would score significantly higher than those in the other two cognitive groups. As mentioned above, we also wished to see if children in the "mixed" group had higher IQs than those in the "prelogical" group, as a possible factor affecting the ESP scoring level of the "mixed" group.

Subjects

Subjects were 50 children between the ages of four and seven, about evenly divided in terms of age and sex. They were recruited on an unpaid, volunteer basis from among friends, neighbors, and an announcement in a local newspaper. A majority of the children were from white, middle-class families living within a 20-mile radius of New York City.

Procedure

The ESP task (M&M's candies) and the administration of the Piaget Conservation Test were the same as in Experiment I. The PPVT was given immediately after the Conservation Test on a day either before or after the ESP test. As mentioned above, one experimenter carried out the ESP tests and the other administered the psychological tests.

Peabody Picture Vocabulary Test

The child was shown three practice pages before the actual test was given. The experimenter read aloud the stimulus word (indicated on the experimenter's answer sheet according to the child's chronological age range) and the child responded by indicating which of four corresponding pictures best fit the stimulus word previously read aloud. This procedure was continued until a "ceiling" was obtained (six incorrect responses out of eight consecutive trials). From this ceiling score the number of incorrect responses was subtracted, and a raw score obtained which was then converted by means of the tables supplied in the *Scoring Manual* into standard score deviation IQ.

Results

The overall ESP score for the 50 subjects was exactly at the chance level. The 22 children who were classified as "prelogical" also had an ESP mean exactly at chance expectation. Five children were classified as "mixed," having some "prelogical" and some "logical" responses. Their ESP mean was 4.70, which is nonsignificant. The 23 children who were classified as "logical" were divided into two subgroups, depending on their level of response. The low-level "logical" group of 15 children had an ESP mean of 5.00 and the high-level "logical" group of eight children had a mean of 5.35. Both of these means are at the chance level. Thus our original hypothesis derived from the first experiment that the "mixed" group would score significantly higher than the other two groups was not confirmed by the results of the present experiment.

When we added the IQ test to this study, we did not hypothesize what we expected to find, although we were interested in seeing whether the children in the "mixed" group, which had ESP scores significantly above chance in the first study, would have higher IQs than the children in the "prelogical" group. Previous work on ESP and IQ in children has given inconclusive and sometimes contradictory results, which will be discussed below. Therefore, what follows is a post-hoc analysis of our data.

Our group of children had an IQ (as measured by the PPVT mean) one standard deviation higher than the PPVT mean of 100 for a corresponding age range. No significance was found when we looked at the overall correlation between ESP scores and IQ ($r = .04$). Nor did any one of the three cognitive level groups have a higher IQ mean than any other. However, when we divided the 50 subjects into high and low IQ groups based on those who scored above and below the mean of our sample, and looked at the difference between the two

runs in both samples, we found that high IQ children obtained significantly higher ESP scores on the second run than on the first run ($t = 2.76$, 24 *df*, $P = .01$, two-tailed). The low IQ group scored nonsignificantly higher on the first run than on the second. For the high and low IQ groups as a whole, the increment in scoring from run one to run two was significant ($t = 2.62$, 48 *df*, $P = .01$, two-tailed).

DISCUSSION

Although the findings regarding cognitive groups obtained in the first study were not replicated in the second study, we believe they are worth putting on record; through examination and comparison of unreplicated studies we may be able to gain deeper insight into the limitations of experimental procedures used in psi testing, and perhaps find new areas for further research.

One possible reason for the discrepancy between the results of the first and second study is the questioning procedure used by the experimenter during the Piaget Conservation of Liquids Test. In the second study the experimenter noticed, when questioning the children about the amount of water in the six whiskey glasses in relation to the amount of water in the comparison beaker, that several of them thought that she meant: Does *each* of the six whiskey glasses contain the same amount of water? They answered "No," and when asked the standard question, "How do you know?" they showed their confusion by saying that one whiskey glass had slightly more water in it than the other whiskey glasses. When the question was repeated, they understood that a *comparison* was to be made between the total amount of water in the whiskey glasses and the water in the comparison beaker. It is possible, therefore, that in the first experiment the experimenter did not realize this confusion and labeled the responses of these children as mixed. They were not classified as such in the second study. The Piaget Conservation Test has been carried out in different ways by different experimenters, and it is not completely standardized in terms of wording. Our experience points out that the wording of a question can bias the response.

Our findings with the PPVT indicate that IQ may be related to ESP scoring in children. Earlier studies of IQ in children provide mixed results. While there are indeed several suggesting that high IQ children are more successful than other children (Humphrey, 1945; Lamacchia and Venzke, 1969; Vasse and Vasse, 1958), there are also studies which show low IQ or retarded children doing well on ESP tests (Bond, 1937; Drake, 1938; Shields, 1976). Perhaps one aspect that needs consideration is the expectation of the experimenter with

regard to high or low IQ and ESP scoring. Studies of IQ in school situations indicate that learning levels go up for children who are expected by their teachers to do well, and vice versa (Rosenthal and Jacobson, 1968). In the second study, ESP testing and IQ testing were carried out by two different experimenters, with neither having knowledge of the other score until the testing for the subject was finished. Future researchers might consider that method when designing ESP experiments that involve IQ.

Since the Peabody test is basically a picture and vocabulary test, it measures only one aspect of IQ—the ability to visualize, or interpret and verbalize pictorial information. This ability has been thought to play a part in the ESP process in adults (Honorton and Harper, 1974). A measure such as the Peabody may prove to be a more adequate measure of imagery than tests such as the Betts QMI (Honorton, 1975). We are planning to pursue this line of thinking in a follow-up study dealing with children and imagery.

The increase in scoring from run one to run two for the high IQ subjects in Experiment II should be taken into account in future psi studies with children involving immediate feedback. Perhaps high IQ children are more motivated and encouraged to compete against themselves, and thus will try to improve their second run ESP scores for both intrinsic and extrinsic rewards. Conversely, low IQ children may become discouraged when they realize they are not succeeding, and less eager to try on the second run.

Because only five children fell into the "mixed" Piaget category in the second study, we were unable to make a valid comparison of their results with those of the "mixed" group that performed significantly in the first study. In fact, the linguistic confusion in the first study may invalidate those results in terms of which children should have been classified as "mixed." On the whole, however, while we would not discourage further work with the Piaget Conservation Test, our own experience does not lead us to believe that the levels of cognitive development it measures are significantly related to psi performance.

We hope that experimenters will not overlook young children as subjects for future psi research. We found in our own studies that by actively engaging the child in the experiment (by getting colorful M&M's candies to eat, helping the experimenter to turn the pages of the PPVT, etc.), the motivational and attitudinal responses were good. This active involvement of the subject helped to establish a non-threatening atmosphere and to build rapport. We also enlisted the support of the parents by explaining to them in advance certain aspects of the experiment (use of water which might spill, candy the child might eat just before dinnertime) and making sure that they

would not be troubled by them. Relaxed parents were seen as playing an essential role in creating the non-threatening atmosphere necessary for testing young children.

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