

A STUDY OF MEMORY AND ESP IN YOUNG CHILDREN

by SUSAN BLACKMORE¹

ABSTRACT

The literature on ESP in children is reviewed. Although many studies show high scoring in children there is little systematic evidence of a relationship between ESP and age and there are many contradictory findings. Two experiments are reported. In a pilot study using Smarities as targets no significant scores were obtained either in a clairvoyance or in a GESP test. Suggestions made for improving the method were incorporated into the main experiment, a study of memory and ESP. Here response pictures were related to target pictures in three different ways, and memory for them was also tested. No differences in scoring between the target types were found nor any relationship to target memorability. No correlation with memory test scores was evident and there was no significant relationship between ESP and age. From these results it was not possible to draw any conclusions about the nature of ESP.

There have been many attempts to understand ESP in relation to more familiar cognitive processes. Among these is the suggestion that ESP is related to memory. This idea goes back as far as 1890 when William James remarked on the memory of Mrs. Piper's control. It is seen again in theories by Price (1939) and Carrington (1945) and in suggestions of the similarity between ESP and memory by Schmeidler (1944) and Pratt (1949). More recently a great deal of experimental work has been provoked by Roll's "memory theory of ESP" (Roll, 1966). For example, varying correlations between ESP and memory scores have been reported (for example by Feather, 1967 and Rao *et al.*, 1977), and a large number of studies has been based on a method developed by Kanthamani and Rao (1974). I shall not consider this literature in detail here. A good review appears in Rao, Morrison, Davis and Freeman (1977), and more detailed discussion of methods for investigating ESP and memory is given in Blackmore (1980 a, b, c, d).

I have previously reported several studies which attempted to distinguish between perceptual models for ESP and memory models. These fell roughly into three groups.

¹ I wish to thank the Science Research Council for the studentship held during the time this study was carried out.

(a) Studies of errors and confusions in ESP. Experiments of this type, using specially designed target sets, gave weak support for the notion that form is more important for ESP than meaning. Kennedy (1979) has recently discussed the role of confusions between targets in consistent missing. He states: "The confusions apparently can stem from factors such as the visual similarity of the targets or from the more abstract relationships of associations between targets." Both these types of relationship were investigated in more detail here.

(b) Experiments with varying target material. Targets of differing memorability and perceptibility were used (Blackmore, 1980c) but no corresponding differences in ESP scores were found.

(c) Correlations between ESP and memory scores. Correlations between ESP and memory have often been reported (see Blackmore, 1980b for a review) but the direction varies (Irwin, 1979). Several previous experiments with adult subjects produced correlations varying in size and direction, possibly dependent on the memory task used (Blackmore, 1980b).

However, in a total of 18 experiments there was only significant ESP scoring in one, and such effects as were noted were barely significant and often contradictory. It could be argued that all the results of the experiments were due to chance variations. It seemed that questions about the nature of the ESP process could not profitably be investigated in experiments in which no ESP occurred. A far better source of ESP was required.

All these experiments had used adult subjects, mostly students and usually tested in large groups. It could be that this method was not conducive to ESP. Therefore in later experiments I used entirely different methods hoping that if a better source of ESP were available it might be possible to resume investigation of the nature of the process. These methods included the use of ganzfeld stimulation to induce a psi-conducive state, the development of a training group learning relaxation and imagery, and finally two studies using young children as subjects. The latter are reported here. The three approaches listed above were again used but with tasks designed for child subjects.

YOUNG CHILDREN AS ESP SUBJECTS

The idea that children may make especially gifted ESP Subjects has long been attractive. In 1937 Louisa Rhine suggested that anecdotes and cases of special child subjects warranted the study of ESP

in children, arguing that children, being more naïve and less analytical than adults, might make especially suitable subjects. The similarities between ESP and primary process thinking and its possible role in early mother-infant communication have been pointed out (Ehrenwald, 1971, 1978) and there is anecdotal evidence for ESP in infants (Schwarz, 1961). Another suggestion is that ESP resembles Piaget's preoperational thinking and may be expected to decline when logical or operational thinking is acquired at the age of 5 to 7 years (Ehrenwald, 1971; Drucker, Drewes and Rubin, 1977). Similarly, Spinelli has seen ESP as an alternative form of cognition to logical thinking and one which is suppressed when logical thinking predominates, as in adults or children over the age of about 8 years (Spinelli, 1977, 1978).

Given these suggestions it is not surprising to find a number of studies of ESP in children. Rhine (1937) reported an ESP test conducted as a game with children aged 3 to 15 years. Positive scores were obtained and were higher for the younger children. She attributed this to the greater appropriateness of the game for the younger children. However, these results must be treated with caution since the conditions were not well controlled and the children were only allowed to continue playing while they were scoring well. In the same year Bond (1937) tested 22 retarded children aged 9 to 14 years and obtained significant ESP scores.

Following these early studies it was not until 1953 that van Busschbach began a long series of ESP tests in the classroom. In his first study (1953) 673 subjects from a Dutch primary school took part in a guessing game in which the teacher, as agent, looked at targets consisting of colours, words or arithmetical symbols. Overall results were highly significant. In the second series (1955) with secondary school pupils the results were at chance. Van Busschbach then tested both primary and secondary school children and found that only the younger group scored significantly above chance and that results were better with the teacher as agent than with a stranger or another pupil. He suggested that these results reflect the special teacher-pupil relationship in primary schools and the fact that secondary school education tends to discourage intuitive thinking.

Similar tests in American schools, using over 1,200 subjects and 40 teachers, again obtained significant positive scoring. The results were similar to those obtained in Dutch schools and in all cases the scores were better with colours as targets. However, presentation order of the target types was not controlled and so this finding may simply be due to an order effect.

Although he reported no correlations between age and ESP scores the difference between primary and secondary school pupils' results

indicated that the younger children were doing better. Van Busschbach (1959) therefore extended his research to a younger age group still, first- and second-grade pupils. In Amsterdam 890 subjects were tested and the results were not significant. In Dordrecht 544 subjects produced very significant scores and the first-grade children scored higher. Van Busschbach attributed this difference to the greater appropriateness of his task for the youngest age group. In both cities girls did better than boys although previous studies had shown no sex differences.

In a final study (1961) over 1,400 first- and second-grade children in American schools were tested but the previous findings were not replicated. Van Busschbach attributed this failure to slight changes in the procedure used and to disruption which occurred as the result of the schools being closed by unusually bad weather.

Overall van Busschbach tested a very large number of subjects and although the results are not entirely consistent they do indicate, first, that ESP can occur in the classroom and, secondly, although he reports no age correlations specifically, that younger children scored the highest.

A different approach has been used by Anderson and White (1956, 1957, 1958a, b) who studied the effect of mutual evaluations of teachers and pupils on scores in classroom clairvoyance tests. Positive evaluations tended to be associated with positive ESP scores and negative evaluations with scores below chance level, suggesting that the relationship affected the direction of scoring rather than its magnitude. Although their early studies confirmed this, nine further ones (1958b) failed to give the level of replicability they had hoped for. None the less, Anderson and White concluded that ESP has been demonstrated in the classroom at all levels.

Vasse and Vasse (1958) tested several groups of 6-year-old children in recess periods at school. A first group obtained highly significant scores. In a second year children were tested both at the start of the school year and again later in the year, when scores were found to have improved.

Louwerens (1960) tested young children aged 4 to 6 years giving the instructions in the form of a fairy tale. Positive scores were only obtained with the teacher, not the experimenter, as agent. In the light of these studies Van de Castle (1959) discussed the special conditions apparently necessary for ESP to occur with child subjects. White and Angstadt compared performance with an agent chosen by the class being tested, or an agent from another class. In a first study (1963a) significantly higher scores were obtained with the classes' own representative, but a further study (1963b) failed to confirm this.

Shields (1962) compared children's ESP scores with measures of

personality and found that "non-withdrawn" children scored higher than those classified as "withdrawn" but there were no differences according to age, sex or intelligence. Musso (1965), in a clairvoyance test with first- to sixth-grade children in Buenos Aires, found no difference according to grade, or to whether the teacher or a stranger acted as experimenter, but did find higher scoring in children who said they believed in ESP.

In precognition tests with children Freeman (1969, 1970) found a psi-differential effect when he separated subjects according to their classification as "likers" or "dislikers" on a word test. Of particular interest here are tests with primary school children which showed sex differences in the scoring. However, over all ESP scores were at chance and no relationship of age to scoring was reported.

Randall (1972) carried out two experiments with third-year grammar school boys, finding significantly high variance in children classified as highly extravert or highly neurotic and significant deviations from chance scoring in hay-fever sufferers, though the latter was only one finding among many negative results from a questionnaire. Although Randall confirmed many of his findings in a second experiment, in both the over all scores were close to chance expectation and again no age relationship is reported.

So far these studies have not provided a repeatable experiment with child subjects but do indicate possibly relevant variables, particularly the relationship between the children and agent or experimenter. There are also indications that younger children score higher even though no study has directly tested this. In view of these encouraging pointers it is perhaps surprising that no further studies reported a correlation between ESP score and age.

More recent research has taken a rather different approach. Drucker and Rubin (1975), interested in the change which occurs, according to Piaget, between the ages of 5 and 7, gave 42 children Piaget's conservation of liquids test and a novel ESP test. Subjects had to guess which colour of M & M's candies would be drawn out of a bag containing 100 M & Ms. The experimenter, wearing gloves, pulled out one at a time, after the child had guessed, and replaced it after each trial. If the child guessed right he was allowed to eat a sweet from another bag. Overall scores were not significant. On the basis of the conservation of liquids test children were divided into logical, prelogical and mixed groups. The prelogical group was expected to obtain the highest score but only the mixed group obtained significant scores. Those tested at home did better than those tested in the nursery.

It is interesting that Drucker *et al.* report that the internal consistency of scoring, across the two runs each child completed, was not

significant for any group although the correlation tended to be higher with higher cognitive level. This raises questions about the validity of comparing subjects on an intrinsically unreliable measure. If the ESP measure is not consistent, can we argue that a correlation between it and another measure is meaningful? (see Blackmore, 1980a). Drucker *et al.* followed this work up with a second study, using 50 children aged 4 to 7, all tested at home, incorporating in addition the Peabody Picture Vocabulary Test. Mean ESP scores were at chance and scores for none of the groups were significant. The only significant (and *post hoc*) finding was that high IQ children scored higher on the second run than the first! Their hypothesis that ESP ability would be related to cognitive development was not confirmed.

So far there is evidence that ESP occurs with child subjects but other findings have been hard to confirm, and there is no direct evidence of a relationship between age and ESP. Given the initial hypotheses it seems that two obvious lines of research have been omitted: one is to test directly the correlation between age and ESP ability, the other is to test young children or infants in GESP tests with their mothers. In fact the most recent research has done just this.

Spinelli (1977, 1978) carried out GESP tests with subjects of all ages to test his hypothesis that paranormal cognition should be more readily observed in an organism that has not yet reached the maturational level at which "complex internalized connections are made". In humans he suggested that ESP should be easier for children under 8 years who have not yet reached Piaget's stage of operational thinking. A thousand subjects were tested in pairs, in age groups ranging from 3 years to a group of old age pensioners. The results were highly significant with the youngest children obtaining close to 45 per cent hits as compared with MCE of 20 per cent, and children under 8 all scoring positively while others scored at chance. A second study with only the three youngest groups achieved similar scores. However, the results of both these studies must be rejected since the agent was allowed to choose which picture, out of a group of five, to "send" to the "receiver". In an attempt to reduce the effect of preferences the pictures used were selected from a larger pool on the basis of preliminary tests with children. Only those which did not show strong preferences were used. However, a new group of pictures was presented on each trial and it is clear that any one picture, in the context of a group of five, will be more or less preferable. Therefore if children's preferences are similar the results could have been spurious. If younger children show more similarity in their preferences then a spurious age effect could also be found.

To counter this argument targets were randomly selected in Spinelli's next study. Fifty subjects from each of the three youngest

groups were tested as well as a group of university students expected to score at chance. The results were very similar to those found previously, with the highest scores obtained by the youngest groups. Spinelli therefore inferred that the earlier results were not due to this flaw in the design.

In addition to age differences Spinelli found higher scoring when subjects were paired for both chronological age and IQ, although these effects might be expected on the hypothesis that similarity of preferences was responsible for the high scoring. Further experiments showed that a complex cognitive task disrupted ESP performance but listening to music improved scores. Finally the role of Spinelli himself was thought to be important and a small series was conducted in his absence. Scores fell dramatically but were still significantly above MCE. Spinelli's results were so far above chance expectation and showed so systematic a relationship with age that the chance hypothesis cannot reasonably be entertained. Also Spinelli seemed able to replicate his findings. However, there must be some hesitation in accepting these results at face value. Spinelli reports neither how frequently target orders were changed nor how they were determined in some of his experiments, and in crucial final experiments he reports that all target sequences were selected from random number tables by independent persons (secretaries) when this was only so for some sessions, not all. Also, not all the original data (i.e. chart recordings) are available for all the highly significant sessions.

Obviously, independent replication was required and Henegan (1979) attempted this. She tested a total of 150 children aged 3-5 years in four series and kept the procedure as similar as possible to that used by Spinelli. In the first series scores were significantly below chance, in the second, close to chance, and in the third, significantly above chance. The fourth, and largest, series tested 50 subjects. Overall scores were not significant and older children, aged 4 to 5, scored higher than the younger ones. Clearly there was a large discrepancy between Spinelli's and Henegan's results. Possible reasons include procedural differences, methodological inadequacies, subject differences, or various kinds of experimenter effect. Henegan discussed the latter in some detail, suggesting that the different motivations of the experimenters might have been crucial. Spinelli was testing his own hypotheses, but Henegan was only attempting a replication. Accordingly she began a study of more personal interest to her, a study of ESP between mothers and their children. Twenty-five pairs were tested. In experimental conditions the mother or child acted as receiver with the other as sender and in control conditions an assistant acted as sender. It was expected that higher scores would be obtained in experimental conditions and that, as in the previous

study, older children would obtain higher scores. In fact, the opposite occurred. Control conditions produced higher scores and the younger children did better. These results were not as Henegan expected but they are in agreement with Spinelli's hypothesis, especially since the children obtained independently significant scores. However, it must be concluded that Spinelli's strongly positive results are not easily replicable. Spinelli subsequently (1979) suggested that the personality of the experimenter and his relationship with the children are crucial but these variables are hard to measure or control.

Finally Shrager (1978) tested 38 children between 3 and 5 years on a GESP test with both their own mothers and a strange mother as sender. The ESP test used M & Ms and various measures of the child's and mother's personality were also made. ESP scores with the strange mother were significantly below MCE and were lower than with children's own mothers. Scores for the latter were close to chance. There were no significant differences with age.

Although many of the studies reported here show evidence of ESP occurring in children many of the effects, with the exception of Spinelli's, are weak and some are inconsistent. It does not appear that using children is the simple way to obtain higher ESP scores. Many studies obtained insignificant results, and the effects of sender-receiver relationship, sex, age, personality and other variables tested do not seem to be consistent. None the less the early indications from van Busschbach's work and the stunning results of Spinelli's imply that very young children may make especially gifted subjects under certain conditions. Both these researchers used GESP tasks and found that younger children scored the highest. I therefore designed experiments to use the youngest children practicable; children at preschool playgroups. I used GESP tasks and tried to emulate the conditions of the most successful studies as far as possible.

Since I had no experience of conducting ESP experiments with young children I first carried out a pilot study with the aim of discovering the best method to use for the main experiment.

PILOT STUDY: A SMARTIE EXPERIMENT WITH YOUNG CHILDREN

INTRODUCTION

Subjects were children at playgroups aged between 3 and 6 years. The method used by Drucker and Drewes with M & M's candies seemed appropriate to this age group. However, they used a clair-

voyance, or possibly precognition, paradigm, since the person pulling the sweets from the bag did not choose it until after the child had guessed and saw the colour only when the child did. Since the most successful studies (Spinelli, 1978; van Busschbach, 1955) used GESP tasks I decided to adapt the Drucker and Drewes method, conducting half the tests as they had done and half with another child as sender. Assuming that M & Ms were much like Smarties I used these as targets. It will be noticed that in many ways this experiment was less than well controlled. For example it would have been easy for me, as experimenter, to cheat. However, this was only intended as an exploratory study and this was not thought important at this stage.

METHOD

Subjects

Subjects were 19 children attending a playgroup in Guildford, Surrey. Their ages ranged from 3 years 1 month to 5 years 10 months, with a mean of 4 years.

Targets

Targets were Smarties of five colours, red, orange, green, yellow and brown. In test 1 they were pulled from a bag containing 100 Smarties and in test 2 their order was randomly determined (see below).

Procedure

Before beginning any tests I spent several hours at the playgroup joining in the activities and getting to know the children. After this an assistant (S.B.) joined me and also spent some time with the children. We took along two owls, "Oggy Boggy" and "Baby Bog", who later helped in the tests. Simple problems of room layout, procedure and co-ordination were ironed out in preliminary sessions. The two types of ESP test were then begun.

In each case either one or two children were selected from the group and asked if they would like to play a game in another room. They were only asked if they were not engrossed in some other activity and were not persuaded if they didn't immediately want to play. We often joined in other play before testing which meant that selection of children was slow, but it is far better to wait until they want to take part than to hurry them when they may not enjoy the tests or do their best. Each child took part in each test on a different occasion. A few had a second turn, making up 20 runs for each test. The two types of test were conducted as follows:

1. *Clairvoyance*: The method was similar to that used by Drucker and Drewes. E had a large cloth bag inside which was a smaller paper bag containing 100 Smarties, 20 of each of the five colours. E put her hand into the bag, selected a Smartie and asked S which colour he thought would be pulled out. The guess was recorded, the Smartie taken out of the bag and its colour recorded, and if the guess was correct the child was given the Smartie and one of the same colour was put back in the bag. It was not possible to see into the bag which was frequently shaken and held at arm's length. Each S completed 25 trials and there was a total of 20 runs. It was soon found that although the children could happily complete the 25 trials their concentration and enjoyment was much decreased after about 15 trials. Therefore in later experiments fewer trials were used.

2. *GESP*: One child acted as sender (S) and the other as receiver (R). Pairs of children were chosen as far as possible to be the same age, since Spinelli (1978) found this preferable, unless they wanted to be tested with a particular friend or a brother or sister. The age differences within pairs ranged from 0 months to 12 months with a mean of 4 months.

Instead of Smarties being drawn from a bag as in test 1 they were given to the sender in a prearranged sequence. Lists of 25 colours were prepared by computer and sealed in envelopes by a second experimenter (T.T.)

When two children had been chosen they were taken into the experimental room and one (S) was seated at a table with the assistant (A). The other, (R), sat inside Oggy's house, a contraption made out of a sheet and an upturned table which prevented R from seeing S. Both children and owls were encouraged to wear "thinking caps" to help them make their guesses. At this playgroup only one room was available, therefore the testing had to be carried out in this way. Precautions against sensory leakage included the use of the owls' house and instructions for the children to keep very quiet with their hands over their mouths when the guess was being made. In later experiments separate rooms were used.

At the start of a run A opened the appropriate envelope and selected the first Smartie, gave it to S and asked him to think about it and try to get his friend in Oggy's house to guess the colour. When he was ready and thinking he was asked to press a switch which controlled a light in the house.

Meanwhile E showed R a row of five coloured Smarties and explained that when he saw the light come on he should guess which colour his friend had. E recorded his guess and then told A, who replied with the correct answer. If the guess was right everybody had

a Smartie. Each pair of children completed 25 trials. There was a total of 20 runs.

RESULTS

The mean ESP score for all runs pooled was 4.95 (S.D. = 2.17). MCE is 5.0 and the difference is not significant ($t = 0.1539$ df $p = 0.88$). The results for the two tests can be analysed separately.

1. *Clairvoyance*: For the 20 runs with no sender the mean number of hits was 4.50 (S.D. = 2.21) which is below MCE of 5.0 but the difference is not significant ($t = 1.0119$ df $p = 0.33$).

2. *GESP*: For the 20 runs with a sender the mean was 5.40 (S.D. = 2.09) which is above MCE but not significantly so ($t = 0.8619$ df $p = 0.40$).

The difference between the two results is in the expected direction, that is, the mean was higher with the GESP method, but the difference is not significant ($t = 1.3238$ df $p = 0.19$). The overall results were therefore not significant but two further points were of interest. First, the relationship of age to ESP score and, secondly, whether the relative age of S and R made any difference.

Relationship of age to ESP

Both van Busschbach and Spinelli obtained the highest scores with their younger age groups although neither reported a correlation between age and ESP scores. Here this can be simply done. In the clairvoyance test ESP score and age in months can be correlated for each S. In the GESP test age can be correlated with both ESP score as S and ESP score as R. The results can be seen in Table 1.

On the basis of Spinelli's and van Busschbach's findings we would expect to find a negative correlation between age and ESP. This was not found. The correlations tended to be positive but were small and not significant.

Table 1. Correlations between age and ESP score

ESP score	<i>r</i>	<i>t</i>	<i>df</i>	<i>p</i>
Clairvoyance R	0.18	0.78	19	0.45
GESP R	-0.01	0.04	19	0.97
GESP S	0.31	1.38	19	0.18

Relative age of S and R

Since Spinelli found that pairs of children of similar age obtained better ESP scores we would expect a negative correlation between ESP score and the difference in age between R and S in the GESP test. Here $r = -0.29$. This is in the expected direction but is not significant ($t = 1.29$ 19 df $p = 0.21$).

DISCUSSION

The results of this exploratory study were not as expected. Overall scores were not significantly different from chance expectation, there was no difference between scores on the GESP and clairvoyance tasks and ESP scores did not appear to be related to age. However, some findings were in the expected direction and a great deal was learnt which made it possible to design a better study. This includes the following points.

1. *The use of a sender*

Although there was no significant difference between the results obtained with and without a sender the difference was in the expected direction, but more important the children by far preferred the test with a sender. In view of this and previous findings, GESP tests are to be preferred.

2. *Run length*

In this study each child made 25 guesses. Although all the children tested managed this easily it was clear that they were losing interest after 15 to 20 trials. Also, in the GESP test, they sometimes wanted to take a turn in the other role (or even as E!). This was originally allowed and the children swapped places for a further 25 trials, but it was obvious that this was too much for them. It would appear preferable to have two runs of 10 trials each with the children swapping roles in between. This is, in fact, exactly the method used by Spinelli.

Targets

Smarties were not found to be ideal targets. The children got very bored guessing from the same five colours on every trial even though every effort was made to make the guessing fun. For example we had to ask the child to say which colour Oggy Boggy would choose, or polish the thinking cap to make it work better and so on. Two improvements might help. Pictures or objects would be more interesting than Smarties and a different target pool on each trial would make it easier for the child to make a choice. Again Spinelli used this method in his successful tests.

MAIN EXPERIMENT: A STUDY OF MEMORY AND ESP IN YOUNG CHILDREN

Ways of testing the relationship between ESP and memory or perception have been discussed elsewhere (Blackmore, 1980a, b). Several of these tests were incorporated into this experiment with the hope that using young children it would be possible to test hypotheses about the nature of ESP.

The aims of this study were as follows:

1. The method was designed to be as conducive as possible to ESP. It was predicted that overall scores would be above MCE.
2. The targets were designed to determine whether the form or the name of the target was more important for correct ESP. If ESP is like other forms of perception we might expect the form of the target to be important and targets similar in appearance to be confused. If it is like remembering, the associations and the name, rather than the appearance, should be most important, and associated targets should more often be confused. Targets related in these ways were included so that the number of confusions could be determined. In this way it was hoped to find out more about the cognitive process involved in ESP.
3. The relationship between age and ESP score was investigated. A negative correlation was expected.
4. The effect of the relative age of the sender and receiver was investigated. A negative correlation between ESP score and age difference was expected.
5. For each child scores on a memory test were correlated with ESP scores. A significant correlation was expected but its direction was not predicted.
6. In a memory test the number of times each picture was recalled was compared with its efficacy as an ESP target. A positive correlation was expected. According to some memory theories of ESP a more memorable picture should make a more effective target (see Blackmore, 1980c).

METHOD

Subjects

Subjects were 48 children, 16 from each of three playgroups, in Guildford, Surrey. Their ages ranged from 3 years 0 months to 5 years 0 months with a mean age of 3 years 10 months.

Preliminaries

Before any tests began I and an assistant (D.L.) spent several hours

at each playgroup getting to know the children and playing with them. Preliminary tests of the target pictures were then begun. A variety of naming games was used to make sure that the children could reliably name all the pictures. The relationships between the different picture types were tested by laying out all the cards, giving a response card to the child and asking him to find another that "looks different but is the same thing". These checks were carried out as games with any children who wanted to take part. Any pictures which children had difficulty with were changed until they reliably and quickly chose the correct pairs. When all the pictures were prepared testing was begun.

Room layout

At the first playgroup only one room was available. At the other two playgroups two adjoining rooms were used.

Selection of subjects

Pairs of children were selected in various ways. Any child who was not involved in other activities was asked if he would like to play a game in the other room. If he wanted to he was asked to bring a friend or else another child was asked. Children varied a great deal in their enthusiasm for playing. Some children queued up outside the test rooms for their turn, or for extra turns, while a few were very shy and it was necessary to play other games with them for a long time before they wanted to come. Usually either two or three pairs of children were tested in any one morning (playgroups ran morning only).

When two children had been selected they were given either the memory test or the ESP test. It should be noted that N is not the same for all tests since some children who had done one test were not available for another and some were so keen for a second turn that a few were allowed one!

MEMORY AND PREFERENCE TESTS

Procedure

Forty-six of the 48 children were given a memory and a preference test, 25 before and 21 after their ESP test. Subjects were tested in pairs since they obviously preferred it even though this would reduce reliability. They sat at a table and one by one the key pictures (see below) were laid out. One child was asked to choose his favourite card and this was turned face down, his second favourite, and so on. Most children (26) chose in some simple order according to position and no strongly preferred or disliked pictures emerged. When all cards were face down the child was asked if he could remember any of them. The

number recalled was recorded, the pictures turned up, and the child given a Smartie (regardless of performance). The second child was tested in the same way. After this the children were asked to choose their favourite colour from five colour cards, which they did easily. The children seemed to enjoy all these tests, especially shouting out the names of the pictures.

ESP TEST

Targets

Targets were coloured pictures painted on white cards approximately 4×3 inches. There were 10 key pictures comprising the response pool and 30 target pictures related to these in three ways. Ten were identical, 10 represented the same object but looked different and 10 looked very similar but represented a different object. On each trial S saw one of the target pictures while R chose from a group of five of the 10 response pictures. These were selected so that one of each of five colours appeared on each trial and each picture appeared exactly once in each position over 10 trials (one run). In this way position and colour preferences were controlled for and yet a different pool was used on each trial. Spinelli used a totally different pool on each trial. However, this would exaggerate any spurious effects due to the preference for one picture among four others. Therefore a limited pool was preferred here.

Target order

The target orders for each run were prepared by computer. The 30 target pictures were coded with a letter and number and the codes chosen randomly except that the numbers of each of the three target types were to be as close as possible equal over the whole series. The target lists for each run were sealed in opaque numbered envelopes by a second assistant (T.T.).

Procedure

One child went with A to act as sender (S), the other acted as receiver (R) and was helped by E. E and A explained the game to the children and demonstrated it with the aid of the owls, Oggy Boggy and Baby Bog. If they wanted to, children could wear thinking caps, the same as those worn by the owls.

A then opened the envelope assigned to that run, selected the first target picture and gave it to S, asked him to think about it to try to help his friend to guess what it was, and when he was ready to press a switch operating a light in R's room. All the time he was asked to keep quiet or to hold his hand over his mouth.

Meanwhile R sat in Oggy's house, made out of a table and a sheet, and was presented with a row of five pictures. As soon as he saw the light come on he was asked to choose which picture he thought his friend was looking at. E recorded his choice, then informed A who confirmed whether or not it was correct. If it was, everyone had a Smartie. The cards for the next trial were then selected. After 10 trials the two children swapped places for a further run in the opposite role.

Forty-eight children took the ESP test, of which only 46 completed the memory and preference tests. In all there were 53 runs of the ESP test because five of the keenest children were allowed to have a second turn.

RESULTS

Preferences

No strong picture preferences were found. Children readily gave preferred colours in the order red, yellow/orange, green, brown and blue.

Memory tests

The mean number of pictures recalled was 3.6 (range 0 to 9, S.D. = 2.0). The reliability of this test is unknown and may be low although informal second tests gave results within 10 per cent of the first score. For this reason results relating to the memory test should be treated with caution.

ESP tests

Overall ESP scores (for $N = 53$) gave a mean of 2.02 hits per run, which is not significantly different from MCE of 2.0 ($t = 0.21$ 52 df $p = 0.83$).

Effect of target type

The number of hits for the three different target types can be compared. There were 36 hits when target and response were identical, 34 when the target picture represented the same object but looked different and 37 when the target looked similar but represented a different object from the response picture. There is no significant effect of target type ($X^2 = 0.17$ 2 df $p = 0.92$). Neither hypothesis about the relationship between target and response was confirmed.

Relationship of age to ESP

On the basis of Spinelli's and van Busschbach's work a negative correlation between age and ESP was expected. The correlations

were calculated for both ESP as S and R and were as follows. N is 45 as the exact age of three of the children could not be determined.

Age-ESP score as receiver $r = -0.13$ $z = 0.86$ $p = 0.39$

Age-ESP score as subject $r = 0.24$ $z = 1.59$ $p = 0.11$

Neither of these correlations is significant and the prediction was therefore not confirmed, but it may be of interest to note that their direction might imply, first, that an older sender is preferable as was found in the previous experiment, and, secondly, that a younger receiver is better, as was expected.

Relative age of sender and receiver

Spinelli suggested that better scores were obtained when R and S were of similar age. In the previous experiment a small negative correlation was found between ESP score and R-S age difference. Here for 23 pairs of children the difference in ages ranged from 0 to 18 months ($\bar{x} = 6$ months). When this difference is correlated with total ESP score for the pair $r = 0.33$ ($t = 1.60$ 22 df $p = 0.12$). This is not significant and is in the opposite direction to that expected.

Relationship between ESP and memory scores

Two correlations were calculated as follows ($N = 46$):

Memory score-ESP score as receiver $r = -0.23$ $z = 1.54$ $p = 0.12$

Memory score-ESP score as subject $r = 0.03$ $z = 0.20$ $p = 0.84$

Neither of these correlations is significant. The prediction was not confirmed but the results agree with the negative findings of previous correlations (Blackmore, 1980b).

Memorability of targets

Previous studies (Blackmore, 1980c) investigated whether more memorable items make better ESP targets. Here the number of times each of the 10 pictures was recalled ($\bar{x} = 14.2$ S.D. = 3.79) was correlated with the percentage hits on that picture ($\bar{x} = 20.44$ S.D. = 5.97). $r = -0.09$ ($t = 0.269$ df $p = 0.80$). This is not significant. It appears that more memorable pictures do not necessarily make better targets. The experiment was designed to test various predictions derived from both a memory theory and a perceptual model of ESP. It was hoped that results, particularly those relating to the target-response relationship, would show evidence for one hypothesis or the other. In fact neither was confirmed and no ESP was detected. It appears that yet again it has been impossible to test hypotheses about the nature of ESP in the absence of any ESP taking place.

DISCUSSION

The results obtained here do not confirm the predictions made. This raises the question of why there should be such a discrepancy between the results here and those reported by Spinelli. Spinelli (1979) has suggested that various procedural differences may be important, for example that giving Smarties may lead to disruptive striving for success, that coloured pictures may be distracting (he used black and white pictures) or that Experimenter and Agent did not spend enough time getting to know the children. Alternatively some kind of experimenter effect could be responsible. This could result from differential procedures or rapport with the children, or from a psi-mediated effect. Finally the possibility that earlier results were spurious should be considered.

All these possibilities are hard to test. Rewards and pictures can be changed, but the subject-experimenter relationship and any experimenter effects are harder to control. In the absence of such tests the only conclusion that can be drawn is that using young children as subjects does not necessarily produce repeatable results even under conditions ostensibly similar to those previously successful.

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