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by

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Abstract

ESP IN CHILDREN:
ITS RELATIONSHIP TO AGE AND PERSONALITY

by

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The relationship between ESP scores and age and a personality measure (the Fisher-Cleveland Body Boundary score) was experimentally investigated using a sample of 115 elementary school children. There was also an exploration of experimenter effect. Children were drawn from the first, third, and fifth grades of a public elementary school and were seen individually by the same person under the same experimental conditions. There were approximately equal numbers from each grade and about half of each sex. Each child was given a variant of the Fisk-West clock card technique (15 targets) and 20 selected cards from Form A of the Holtzman Inkblot Technique (HIT) which were scored for Barrier and Penetration. The clock card ESP test was administered under a GESP paradigm permitting both telepathy and clairvoyance. Although visible to the experimenter, the targets were concealed from the children by a cardboard screen and the children sat eight feet away. About half the children were given feedback after each target, the

remainder at the end of the ESP test.

There was a significant decline of ESP scores with age (p=.031) with the first graders scoring suggestively better than the third graders (p=.097) and significantly better than the fifth graders (p=.045). There was no significant difference between the third and fifth graders. The first graders also scored significantly above chance for ESP (p=.025), the third graders at chance, and the fifth graders insignificantly below chance. There was no significant relationship between ESP score and Body Boundary score (Barrier minus Penetration) or Barrier or Penetration score separately. No significant interaction effect was found between age and Body Boundary in relation to ESP. There was no significant difference between the Immediate Feedback and Delayed Feedback groups on ESP scores. None of the experimenter measures or experiment-related variables such as time, date, or order showed a significant relationship with ESP score. Various explanations for the decline in ESP with age were considered and some ideas for future research were suggested.

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My appreciation also goes to the faculty and students of the Hosmer School in Watertown, Massachusetts for their cooperation.

This work is dedicated to my mother, Helen J. Katz, and my teacher, Professor Max Hertzman, neither of whom lived to see it completed.

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INTRODUCTION

It is possible to consider ESP abilities as either rarely occurring and possessed only by a small number of individuals, or as a normal human ability, present differentially from individual to individual, generally weak and intermittent, and affected by developmental and personality factors and by environmental influences. The second of these alternatives is generally accepted by those who work with ESP. While parapsychologists sometimes study individuals who seem especially gifted in ESP, in general subjects are not pre-selected for ESP abilities, but for other characteristics such as age. Although there has recently been a return to the study of individual outstanding subjects, perhaps because of the more dramatic effects they can produce, this is not due to a lack of successful ESP results with subjects who were unselected in terms of ESP ability.

ESP and Age

Most ESP research has used adult subjects. An exception has been the work stimulated by Anderson and White (1956, 1957) using classroom teachers as agents in clairvoyance experiments. These studies, and similar designs by other experimenters, showed a relationship between teacher-student attitude and ESP scores. The majority of ESP studies with children use a group administration of an ESP test in a classroom

setting. Most work is with older children and adolescents, who are able to work without the individual attention a younger child would require. Some recent work with younger children has been done, however (Drucker, 1977; Schrager, 1977; Spinelli, 1977), which used different experimental settings and procedures.

In a recent review of the literature by Palmer (in press) he concludes that there is some evidence that children score more significantly and positively on forced choice ESP tests than do adolescents and adults, although this effect seems to be more clearcut for GESP designs (in which there is the possibility of telepathy and/or clairvoyance operating) than in clairvoyance designs. Palmer then cites ten studies and states:

> Experiments comparing age ranges within these broader categories have failed to yield significant relationships (Anderson and Gregory, 1959; Anderson and McConnell, 1961; Green, 1965; Musso, 1965; Shields, 1962; Spinelli, 1977; Van Busschbach, 1961; White and Angstadt, 1961, 1963a) with one exception (Van Busschbach, 1959).

A careful examination of these studies reveals that not all of them were correctly summarized by Palmer, and a variety of confounding variables was present in the remainder. Anderson and Gregory used the same teacher and students for a two-year period, but the first year used clairvoyance tests while the second year they tested precognition. Anderson and McConnell

had a small number at each age in a combined fourth and fifth grade class. Although the results were not statistically significant, there was a decline for both boys and girls between fourth and fifth grades. (Boys scored slightly higher in both groups, perhaps because the task of "mentally launching a rocket" was one that interested the boys more.) The Green study (1965) was of birth order and family size, not age. Shields (1962) worked with children referred for emotional, learning, or behavioral problems and so did not have a sample representative of normal children. The Musso study (1965) involved eleven different people acting as experimenters; this may have confounded the findings. Van Busschbach (1959, 1961) used classroom teachers as agents and got a significant decline between first and second grade Dutch children, but not with American children. White and Angstadt (1961) used different teachers and (1963) different students as agents. With varied experimenters, there might have been confounding with specifics of experimenter personality or ESP ability which could affect results either positively or negatively, and it is impossible to tell in retrospect if this occurred.

Spinelli (1977) did, in fact, find significant differences between children in different age groups. In his first experiment, a total of 1,000 subjects were tested, divided into ten age groups each of which had 50 males and 50 females. The three youngest groups ranged from age 3 to 8 and the oldest

reached age 70.

> Subjects were tested in teams of two. Pairs within each age group were matched on intelligence. Each subject was given "sender" or "receiver" instructions. The sender picked which of five pictures he wanted to "transmit." The receiver had to guess which picture it was. At the end of ten cards, they reversed roles.
>
> The three groups below age eight obtained scores significantly above chance ($p < .001$). The youngest subjects (3-4) scored significantly higher than the other two groups ($p < .001$) and the middle group (4-5) scored significantly higher than the older (5-8), $p < .001$. There was no difference between males and females. All other groups scored at chance levels.
>
> Although no non-random bias in target selection was shown, replication was done with randomized targets. Only four age groups were used - the three youngest plus adult (university) group. There were 50 subjects in each group. The youngest scored above chance ($p < .001$) and the adults at chance. The youngest were again higher than the other two, and the middle higher than the oldest group of children. (pp. 123-124)

Spinelli related his results to the Piagetian framework and predicted a decline once the child enters the concrete operational stage wherein he can make real internalized connections of cognitive connections. No details were given regarding the specific number of children of each age within the three groups.

A study by Drucker, et al. (1977) found some interesting trends similar to Spinelli's using a Piaget-type measure of cognitive development rather than just chronological age. Some exploratory research by Peterson (1975) indicated that children

who spontaneously reported clairvoyant experiences stopped making such reports at about age nine which he, like Spinelli, suggested might relate to the change from pre-logical to logical thinking described by Piaget.

While this line of reasoning seems promising, it seemed premature to give up examination of the relationship of chronological age and ESP ability in children without doing research in which those factors known to strongly influence ESP scores were either controlled or included and measured. That is the sort of study that was attempted here. Details of procedure are in the Method section. In order to control for experimenter effect and get some measure related to the subject's personality, the same experimenter saw each child individually, in the same experimental setting, and administered both an ESP test and personality measure. The experimenter kept a record of physical state, interest, mood, and rapport with the children, and a similar record for target preparation. Relevant information on attitude was obtained from the others involved in target preparation and scoring. A summary rating of degree of enjoyment of the session was obtained from the children.

The hypothesis was that successful performance on an ESP test would decrease with age. This might be due to natural developmental trends, such as the cognitive changes described by Piaget. Another possible contributor to a decline might be learning and societal conditioning. If such a decline exists,

it would have numerous implications. Further exploration of these issues will be found in the Discussion section.

ESP and Personality

One area in which a great deal of research has been done is that of the relationship between personality factors and ESP scores on various tests. According to Schmeidler (1975) one basic predictor variable of successful ESP performance is the tendency to leave oneself open to impression, a free, uncritical readiness to respond. This generalization is based on a large and varied body of research.

Schmeidler's initial hypothesis was that subjects who completely rejected the possibility of ESP success under the conditions of the experiment would have lower scores than all other subjects. This was tested in a series of experiments over a period of nine years. The difference between the above chance scores of those who admitted some possibility of ESP success under the test conditions ("sheep") and the below chance scores of those who denied it ("goats") was significant at odds of more than a million to one (Schmeidler and McConnell, 1958). Additional studies by Schmeidler and others, reviewed by Palmer (1971) supported the original finding of a "sheep-goat effect."

The broader generalization grew out of a variety of research into the relationship between successful ESP performance

and personality characteristics. Shields (1962) found that children diagnosed as withdrawn made significantly lower ESP scores than all others, while other diagnostic categories were all associated with high scores. The implication is that children who withdrew from other aspects of their experience also withdrew from the ESP targets. In a more recent study (Shields and Mulders, 1975) it was found that children who sought attention, power, or revenge scored significantly higher than those who sought to avoid attention or display their deficiencies. Using a composite measure of openness versus closedness, Braud (1977) found a significant relationship between psi and lack of defensiveness. Johnson and Kanthamani (1967) gave a defensiveness test to their ESP subjects and found that the more defensive had lower ESP scores, the less defensive scored higher. Kanthamani and Rao (1973) found that subjects who scored low on a Neuroticism Scale obtained more ESP hits than the High-Neuroticism subjects. Palmer (in press) reviewed many studies relating ESP scores to "neuroticism", defined broadly as "tendencies towards maladaptive behavior caused either by anxiety or defense mechanisms against anxiety" (p. 106 of MS.). After discounting experiments where significance was based on post-hoc classification of subjects or analysis of extreme scores only, there were only seven studies which resulted in significant simple relationships between ESP and neuroticism. In all of these, however,

the least anxious or defensive subjects got the highest ESP scores.

When considering only those studies which involved individual, rather than group or classroom testing, the less neurotic subjects scored higher in 20 series, while the more neurotic scored higher in only six. Palmer concludes that:

> There is a clear trend in the data indicating that persons whose responses on personality tests indicate relatively good emotional adjustment score more positively on standard ESP tests than do more "neurotic" subjects. . . . The fact that the relationship is more consistent when subjects are tested individually may be because neurotic tendencies do not become engaged in relatively non-threatening group testing situations, where a subject can "lose himself in the crowd." Differences in predispositions to anxiety (which is what these personality inventories measure) would be expected to have their greatest influence when subjects must face a strange experimenter alone and have their performances singled out for evaluation. (p. 108)

The studies relating extroversion and introversion also seem to be consistent with the idea that openness and ESP scoring are positively related. Eysenck (1967) reviewed several studies of extroversion and introversion in relation to ESP and found a clear trend for higher ESP scores among the extroverts, the group that would be expected to give livelier and freer responses. Palmer (in press) also concludes that "there is a clear trend in the data indicating a positive relationship between social extroversion and scores on standard ESP tests." (p. 109). He attributes this, however,

to the superior social adjustment of these subjects, which enables them to adapt to and be comfortable in social situations such as psychology experiments. Palmer also notes that the extroversion and neuroticism scales that have been used in ESP research have a high degree of correlation.

Palmer also concludes that the apparent positive relationship between ESP and intelligence is the by-product of a more fundamental relationship between ESP and personal adjustment. This would allow for the semmingly contradictory findings of highly significant psi-hitting among mentally retarded children. Shields (1975) noted that her sample of retarded children (who scored significantly on a clairvoyance test) were often typical of Schmeidler's high-scoring subjects in being impulsive, emotional, carefree, relaxed, and good-natured. The single subject described by Drake (1938) was seen in the context of an apparently good, close mother-son relationship. Schmeidler (1962) found suggestive positive correlations between IQ and mental age, and ESP scores with clock-card targets, in a study of children. There was, in addition, a significant positive correlation between ESP scores and the speed of finding hidden pictures. Schmeidler suggests that "ESP should be considered a 'normal' human ability, which is perhaps related to the ability to take a new look at some situations and find previously unobserved patterns in it." (p. 50).

ESP and Barrier and Penetration Scoring

In a rare study which used ESP scores to predict a personality score, Schmeidler and LeShan (1970) successfully predicted that subjects who had high ESP means and high variances would be lower on Barrier (Br) and higher on Penetration (Pn) than those with chance scores and low variances. Neither Barrier nor Penetration carried the relationship; it was only the Barrier-Penetration pattern which was statistically significant.

The idea that sensitivity to stimuli relates to body boundaries is not a new one, although it has predominantly appeared in theoretical rather than empirical reports, especially in ESP research. Bergman and Escalona (1949) suggested that hyperactivity and hypersensitivity for various types of stimuli occurred in schizophrenic children in whom there was an absence of adequate boundaries to protect the individual against being overwhelmed by stimuli exceeding certain intensity levels.

Going a bit further afield, Randall (1972) in two studies of English schoolboys found that there was a significant correlation between ESP scores and suffering from hay fever (positive the first time, negative the second). Although it may be coincidental, the term "sensitive" is used to mean "allergic" and is also used to refer to someone who is "psychic." In another study Hirt, Goldberg, and Bernstein (1968) found

that the only significant correlations between an Allergy Potential Score (APS) in bronchial asthma patients, and the wide range of variables for which the Holtzman Ink Blot can be scored were with Hostility and Penetration. The high APS scorers also scored significantly higher on these two variables than the low group, although the authors note that as in the case of the correlations, one significant t-test could have occurred by chance alone.

As well as the indicative empirical evidence for the correlation between high ESP scores and being relatively low on Barrier and high on Penetration (Schmeidler and LeShan, 1970), there is a suggestive theoretical basis for this. Extremely high scores on either of these variables seem to be more typical of psychiatric populations than of normal ones (although the range for a normal population is quite wide). ESP scores of severely maladjusted individuals have generally been found to be unusually variable, averaging near chance but often with a high variance. There is also a different cluster of personality traits associated with each of these variables, which will be discussed in the next section.

One interesting point is that there is some confirmation of Fisher's (1968) hypothesis that high Barrier subjects experience stimuli with more intensity than low Barrier subjects. Cauthen and Boardman (1971) found that subjects with high Barrier scores judged weights as heavier than those with lower

scores. Wertheimer and Bachelis (1966) have reported that the Barrier score is positively correlated with the ability to make fine discriminations between various hues. Twente (1964) observed that the Barrier score was positively linked with the degree of receptivity to sensory experience upon awakening in the morning. Perhaps of even greater pertinence is the fact that the Barrier score has proven to be positively correlated with a pattern of physiological activation which is tied in with an orientation of alert receptivity for "outer" stimuli. Fisher (1968) notes:

> The boundary appears to function as a sensitive interface between the individual and the outer world. It serves to individuate him but at the same time permits him to "tune" outwardly in an alert fashion. With the above perspective, it was hypothesized that the boundary functions to heighten receptivity and therefore to increase the vividness of stimuli. The person with definite boundaries is assumed to experience what impinges upon him with more perceptual intensity than does the person with indefinite boundaries. (p. 393)

The finding was that the more definite an individual's boundaries, the more intense a picture would appear to him. With increasing boundary delineation, there is a demonstrated greater interest in communication and readiness to invest energy in perceptual receptivity. This orientation imparts increasing subjective intensity to experience. Fisher further observes:

> Since the sense organs, for example, eyes, ears, touch receptors, do constitute a part

> of the body periphery, it is possible that they share in the activation and heightened awareness of the periphery which characterizes the existence of a well-defined boundary. Such activation could serve to increase sensitivity and therefore to augment intensity. The boundary may be conceptualized, then as existing both in terms of central attitudes and patterns of peripheral activation. Probably, the central and peripheral variables are integrated into an organized system and have mutually reinforcing properties. . . . Perhaps the degree of perceptual vividness contributes to how lively, stimulating, and interesting the "outer world" appears. The individual with definite boundaries who from day to day sees the world relatively vividly may therefore find it more exciting and provocative and demanding of self-investment than does the individual with indefinite boundaries whose perceptual experiences are muted. (p. 396)

Although it is unclear whether High Barrier scorers focus outward more because stimuli are more intense to them, or whether this greater outward focus intensifies stimuli, it is clear that their attention would be more focused on the external world. Extrasensory perception, while actually involving externally generated stimuli, is usually experienced as an internal process, a sort of "inner knowing". Therefore, those who tend to be more aware of internal processes (within the limits of being adequately in touch with external reality) would be expected to score higher on an ESP test than would those High Barrier people whose attention tends to be externally directed.

BODY BOUNDARY: BARRIER MINUS PENETRATION

The difference score (Barrier minus Penetration) used by Schmeidler and LeShan (1970) as the personality variable predicted by ESP score, was derived from the Barrier (Br) and Penetration of Boundary (Pn) scoring system developed by Fisher and Cleveland (1958) which was further refined in 1968. Although the original concept was derived from patterns found in Rorschach protocols of arthritics, and initial work emphasized differentiating between those with exterior and interior sites of psychosomatic disease, the concept and scoring system have found wide applicability in the areas of personality and social behavior as well.

In examining Rorschach protocols of arthritics (Fisher and Cleveland, 1958) it was noted:

> One group of references had to do with assigning definite structure, definite substance, and definite surface qualities to the bounding peripheries of things. These references took such diverse forms as noting the unusual fuzziness of the skin of an animal, emphasizing the decorative pattern of a surface, or elaborating upon the clothing worn by a person. . . . A second group of references, which was the basis for another boundary score, had to do with boundary peripheries only in the negative sense of emphasizing their weakness, lack of substance and penetrability. Responses of this sort concerned surfaces being broken, destroyed, or absent. They were labeled "Penetration of Boundary responses." (p. 58)

It was considered that a score based on Barrier (Br) responses would tap the boundary dimension at a level of positive assertion

of boundary definiteness. A score derived from Penetration of Boundary (Pn) responses was perceived as getting at sensations of boundary breakdown and fragility. It has turned out that the relationship between the two scores is not a simple obverse one (Fisher, 1970), although the Pn score does behave in a variety of studies as if it were a measure of some aspect of boundary definiteness. It often seems to tap the obverse of the Br score, but it cannot be experimentally linked with patterns of inside-outside body experience.

The original work also reported exploratory studies of the new scoring system. It was found that, if well trained, scorers could learn to agree with regard to both the Br and Pn indices at a correlation level somewhere in the .90s. It was also found that the Rorschach response total was correlated significantly with both the Br score and the Pn score, leaving no doubt concerning the necessity for controlling response total when body-image scores from different individuals are to be compared. Initial studies found only a chance relationship between intelligence and the body-image scores. There were some different scoring patterns by sex in children. At ages 5-7, girls produce significantly more Br responses than boys, but at ages 10-13 this situation is reversed. Age 5-7 boys give significantly more Pn responses than do girls. At the 8-10 year level and beyond age 13, no sex differences for Br scores were found. This last finding has not held up in

more recent studies (described below) which have found that there is a tendency for females to score higher in Br and lower in Pn than males. This will be further discussed later.

The scoring system was further refined (Fisher, 1970) in order to simplify scoring by reducing the number of exceptions. Correlations between scores based on the old and the new, more simplified criteria are of the order of .98. The new system was used in this research.

Criticisms of Barrier and Penetration Indices and Responses

The major criticisms of the Fisher-Cleveland indices have to do with 1) whether they actually represent measures of body image, or are more indicative of cognitive or perceptual operations and 2) whether they simply covary with traditional Rorschach scoring categories and do not add anything useful or new (Mednick, 1959; Wylie, 1961). Mednick especially noted that there are pervasive errors in the statistical analyses of the original studies, and that the authors used the most liberal options available. He predicted as a consequence reduced reproducibility of results, since the reliability of the Barrier score is quite limited.

Fisher (1963) was aware of these criticisms and responded:

> Such criticisms cannot be easily dismissed. The complete absence of previous empirical work with regard to body boundary feelings has made it difficult to find adequate body image criteria against which to validate the boundary properties assumed to characterize barrier and penetration

> responses. Certain lines of evidence support a body image conceptualization of the data which have accumulated. (p. 68) . . . No dependable relationships have been found between the boundary scores and indices which might be considered to have cognitive or "perceptual style" connotations. The boundary scores are not consistently related to such variables as intelligence, verbal productivity, the Barron simplicity-complexity dimension, Gottschaldt figure judgments, conventional individual Rorschach determinants, speed of figure-ground alternation, rigidity or authoritarianism. (p. 73)

The issue of covariance with number of Rorschach responses has been nullified in two ways: using the Rorschach with a standardized, fixed number of responses requested or reducing the response total, or (as in the majority of recent research) using the Holtzman Ink Blot technique which was designed to incorporated Br and Pn scoring, and limits responses to one per card. The latter method was used in this research and will be discussed in a separate section.

There is continued criticism of the construct validity of this measure as a body-image score, however. Hirt and Kurtz (1969) reported two experiments which compared patients with body-interior symptoms with those with body-exterior illnesses. The results failed to replicate previously reported empirical findings and challenged the construct validity of the Fisher and Cleveland model. Azcarate (1969) pointed out that they neglected to give details of the specific symptoms included in each group.

> A dichotomy of body interior and body exterior illnesses can be misleading unless it is clearly operationally defined. Even then, exterior manifestations of a disease, for example in arthritis, may be only part of the symptomatology. An unmeasurable factor such as pain may localize itself at a distance from the particular area being treated. This could constitute an attempt on the part of the patient to develop an "interior" symptom in addition to the "exterior" one already present. . . .It has to be emphasized that barrier and penetration are measures derived from psychological instruments and indicate the interaction of the patient with unstructured and ambiguous stimuli. Fisher and Cleveland (1958) seem to imply from their findings that barrier responses are associated with outer control and penetration responses with inner control. (p. 495)

Azcarte then reports finding that a combination of High Barrier and Low Penetration was associated with good psychological control while a combination of Low Barrier and High Penetration was associated with poor psychological control.

More recently, Hirt et al. (1971) administered the Rod and Frame test, the Repression-Sensitization scale, the Internal-External Control scale, and the Holtzman Inkblot Test, without finding any significant relationships. They again questioned the construct validity. Meares (1971) suggested that the Barrier score reflects an individual's manner of concept formation in general, rather than a body image concept in particular. Van De Mark and Neuringer (1969) acknowledge that because previous studies were correlational in nature, they do not provide a critical test of the assumption that body sensations cause particular effects to appear on the Rorschach.

They noted:

> A critical test of the assumption that the body image influences perceptual organization of unstructured stimuli would have a) to be based on actual presentation and manipulation or arousal conditions that would lead subjects to experience their bodies in certain known ways and b) to then relate these experimentally induced states to Rorschach responses. If it can be demonstrated that the experimental manipulation of body awareness focus produces concomitant Rorschach responses, then Fisher and Cleveland's underlying assumption is substantially corroborated. Such a demonstration would also support the wider contention that the matrix of body experiences in one's life, referred to as the body image, can contribute to the factors mediating and influencing one's perception of self and world. (p. 460)

It was found that the externally aroused somatic focus subjects produced significantly higher Barrier scores than did the other subjects and that significantly more Penetration responses were made by the internal somatic focus group when compared with the other groups. It was concluded that the results of this study verified the relationship between boundary scores and body image, and the underlying assumption that body image states influence perception.

Interscorer reliability for Barrier and Penetration varies from .82 to .97, with most values clustering in the high .80's and low .90's (Fisher and Cleveland, 1968). The reliability of these two scores over time is of acceptable magnitude in test-retest studies, although Pn coefficients tend to be lower than those for Br.

Definition of Penetration Score

In general, the Penetration score has proven more difficult to define consistently than the Barrier score. There is some evidence that it is considerably more sensitive to immediate situational factors than the Barrier score. Fisher (1970) observes that it seems to reflect not only body attitudes but also special sets elicited by specific situations. It has behaved most like a body boundary index in hospitalized patients with psychosomatic symptoms. In such populations it has been consistently related to the exterior-interior sites of symptoms in a manner which is the obverse of the relationship of the Br score to such symptom sites. It is suggested that perhaps body attitudes in these patients are so prominent that they far outweigh any immediate situational variables that might influence the Pn score. The Pn score seems particularly sensitive to situational variables when college students without gross body symptomatology have served as subjects.

The Pn score is not negatively related to the Br score in most normal samples. A modification of the Pn score which includes only responses referring either to the interior of the body or modes of entry to the interior, and excludes all non-body percepts which are part of the usual Pn scoring, was used by Cassell (1964). This score was significantly negatively related to the Barrier score in a normal sample. There

is no evidence as to whether this score is as affected by situational variables as the Pn score used in other research. It is possible that it is partly this susceptibility to situation which resulted in significance when combined with Br for the boundary score used by Schmeidler and LeShan (1970), since ESP scores are also influenced by situational variables. The Fisher-Cleveland revised scoring (1968) will be used here, since that is the system being used in current research and there is also a .98 correlation with the original scoring system.

Body Boundary and Personality

The relationship of the body boundary scores (Br and Pn) with various personality and behavioral variables indicates differences between those with definite boundaries and those with indefinite boundaries, summarized by Fisher (1970):

> There were broad differences between them in personality, values, and style of behavior. Those with definite boundaries proved to be relatively more autonomous and "self-steering." They were more likely to have high achievement motivation and to seek task completion than the poorly bounded. They were less suggestible and also less likely to be blocked or disturbed when confronted by stressful frustration. The definite bounded individual displayed more independence in group interaction, but in such a manner as to facilitate rather than interfere with group objectives. In his general outlook he was more oriented toward interaction with others. He was more interested in communication; and literally had a greater preference for human contact. The vaguely bounded person was,

> contrastingly, characterized by interests in activities and vocations that minimized the human factor. (p. 165)

Boundary Scores and Sex Differences

Although it had been accepted that there were no adult sex differences in boundary definiteness, more recent studies indicate that small but consistent differences are present when careful controls are imposed to obtain an equal number of responses from men and women with similar educational and socio-economic backgrounds. In general, it has been found that males have lower Barrier and higher Penetration scores than females. Similar sex differences have been found in children. Morton (1965) reported that girls had higher Br scores than boys in samples of 12, 13, and 14 year olds given group-administered Rorschachs. Gordon (1964) examined 360 normal children with individually administered Holtzman Inkblots. There were three groups, consisting of six, nine, and twelve year olds, with an equal number of boys and girls in each age group. Girls scored higher on Br and lower on Pn that did boys at all age levels and the overall sex effect was significant. In light of these findings, the relationship between gender and Br and Pn scores was exmined before determining the method of sorting by boundary score for data analysis.

Boundary, Age and Sex Differences in Children

While some correlations have been found between boundary scores and other variables in some samples of children, no pattern can be clearly determined. Fish (1960) studied 7, 9, and 11 year old boys and found no indications of progressive change in boundary scores with age. The Br score was positively correlated with ability to represent adult qualities in figure drawings at age 7, and with a more mature mode of time perception in 7 and 9 year olds. Woods (1967) studied 8, 10, and 12 year old boys and girls and found that the Br score increased, with one exception, at each age level. There were no relationships between Br score, estimates of dimensions of body space, and performance of selected gross motor tasks. Witzke (1975) found that the variable factors for children were highly similar to those found in previous factor-analytic studies of the Holtzman Inkblot Test. Malev (1961) found that for both six and eight year old boys, the greater the boundary definiteness, the more likely they were to manifest a significant predominance of exterior over interior symptoms. The patterns of physiological reactivity differed from that characterizing adults, and Malev questioned whether there might not be systematic differences at certain age levels. Holtzman (1965) observed a low order but significant positive correlation between WISC vocabulary and Barrier score in children. Andrews (1968) found a significant low positive correlation

between IQ and Br in a sample of 6-7 year old girls, but the relationship was non-significant in a sample of boys of the same age. Laird et al. (1973) found significant correlations between Br and Metropolitan Reading Test results for boys in every grade but the fifth, while among females correlations failed to reach significance at any grade level. The procedure covered grades 2 through 6, but nothing was said about whether N was equal for boys and girls, or whether the difference between male and female correlations was significant.

There are also some interesting relationships when other personality and behavioral measures are considered. Swartz (1965) matched pairs of children in grades 2 through 6 by grade, sex, and IQ. They differed in that one member of each pair was in the lower third of scores on Sarason's Test Anxiety Scale for children, the other was in the upper third. The High Anxiety group gave more rejections on the Holtzman Inkblot Test (HIT) than the Low Anxious (mean of 2.15 compared with a mean of 0.35). On Br, the High Anxiety group had significantly lower scores than the Low Anxiety group. This is consistent with the findings of Fisher and Cleveland (1958) that the high Br group is more impervious to stress. In 1968, Swartz and Swartz did a similar study with first, fourth, and seventh graders. This time, although Br scores were in the expected direction, they were not significant. Pn, however, was significantly higher in the High Anxiety group than in the

Low. The authors suggest that perhaps the Pn score can be viewed as measuring one end of a continuum of ego integration and adjustment generally associated with the Br score. R.L. Fisher (1966) found that boundary definiteness as measured by the Br score does predict achievement drive as defined by school achievement in both sexes; but at the level of social behavior, the relationships are different for boys and girls. Well bounded boys were high achievers in school and also impressed teachers as possessing forceful, achievement-oriented traits. High Br in girls went with high achievement in academic behavior but was not similarly represented in general trait behavior as it was perceived by the teacher.

In a study of male, white public school students (R.L. Fisher, 1968), a well-defined personal boundary was significantly positively related to effectiveness, maturity, and ability to behave in a controlled fashion in the classroom, based on teacher ratings. Morgan (1968) found that a clinical group of elementary school children scored lower on Br and higher on Pn, although not significantly. Liebetrau and Piemaan (1974) used the revised scoring scale applied to Rorschach responses of 6, 8, 10, and 12 year old boys and girls rated as high or low adjusted by classroom teachers. There was no statistically significant difference between body boundary awareness of high and low adjusted children at 6 years of age; after 8, however, high adjusted children significantly exceeded

low adjusted children in body boundary awareness. There was no significant difference for low adjusted children between 6 and 12 years of age. The difference between high and low adjusted children was therefore related to a sustained increase of body awareness in high adjusted children. No significant differences in Pn scores were found between high and low adjusted children at six. The difference which appears at age 8 was due to the significant increase in Pn of low adjusted children only. At ten years of age there is a significant difference in Pn between groups due to a significant rise in Pn of high adjusted children and a significant drop in low. At 12, both groups reverted back to previous levels. The authors conclude:

> It seems that the age of ten represents an exceedingly important stage in the development of both high and low adjusted children. High adjusted children seem to reach the pinnacle of body penetration awareness at about 10 years of age. Keeping in mind that the high adjusted children also manifested a heightened body boundary awareness with an increase in age . . . the results seem to indicate that high adjusted children become more aware of their bodies in all respects, especially at 10 years of age. Low adjusted children, on the other hand, seem to become more aware of the interior layers of their bodies, except at ten years of age. (p. 233)

Body Boundary and Altered States of Consciousness

Although there is only one study directly correlating body boundary and ESP, there are a few studies that might be

more directly related than the more general personality and behavioral studies described above. Buck and Barden (1971) scored descriptive reports of dreams, depersonalization experiences, daydreams, and autobiographical material for Barrier and Penetration. Pn imagery was significantly higher in depersonalization experiences than in autobiographies and daydreams. Br imagery in depersonalization was clearly below the other states. If depersonalization is seen as an altered state of consciousness in which there is a reduced sense of being a separate individual, it begins to resemble the state described by LeShan (1974) as characteristic of the psychic experience. This pattern of relatively low Br and high Pn is the one found associated with ESP by Schmeidler and LeShan (1970). In a study of hypnotic susceptibility (Fisher, 1963a) it was found that for the male subjects, a combined Barrier minus Penetration score was strongly negatively correlated with susceptibility, as measured by the Stanford Hypnotic Susceptibility Scale. Stanford (1972) found that susceptibility to hypnosis was positively related to ESP scores. McBain et al. (1970) found a significant positive correlation between ESP and the agents' scores on the Stanford Hypnotic Susceptibility Scale (although not with the percipients' scores). Finally, there are the studies cited in the previous chapter which show a positive correlation between Barrier score and perceptual vividness and exterior focus.

It seems clear that the matrix of body sensations which we refer to as the body image affects an individual's perceptions of unstructured targets like inkblots (Fisher, 1965). The Fisher-Cleveland Barrier and Penetration scores are related to and predictive of directly related bodily responses, and a wide range of personality and behavioral variables as well. It seemed worth investigating whether there is not only a relationship with sensory perception, but with extrasensory perception also.

THE HOLTZMAN INKBLOT TECHNIQUE

The Holtzman Inkblot Technique was developed in order to provide a projective test which would be psychometrically valid, unlike the Rorschach (Zubin, 1954) but still provide the same sort of clinical usefulness. This technique (Holtzman, et al., 1961) has been considered to have a number of advantages over use of the traditional ten Rorschach cards and to be particularly appropriate for scoring for Barrier and Penetration. These scores were included from the beginnning in the original standardization and validation studies of the Holtzman Inkblot Technique (HIT), so there is extensive information on developmental norms and various correlates for these two measures. Since the HIT was designed for one response per card, the effect of total number of responses on Br and Pn is eliminated except for the issue of rejections. That problem will be considered in a later section.

The HIT consists of two parallel sets of 45 inkblots each (Form A and Form B), as well as two practice blots (one achromatic, the other with some red) which are common to both sets. The order of achromatic and chromatic blots was randomized to minimize undesirable sequential effects. The original standardization populations were college students and hospitalized schizophrenics. In addition, large-scale testing was carried out with public and parochial school elementary students, firemen, housewives, and other populations in the Austin,

Texas area (Holtzman, et al., 1961), fourth graders in Connecticut, and eleventh graders in Chicago. Split-half reliabilities (first 22 even cards compared to 22 odd cards, dropping the 45th) were found to be rather low for both Br and Pn. Br had a good distribution for all the normal samples, but Pn tended to be skewed (Holtzman, et al., 1961). From this, it is reasonable to conclude that if it is necessary to reduce the number of cards used, the same cards should be used with every subject. Although the full 45 blots can be given to subjects as young as five years, it seems advisable to reduce that number for this research since administration of the HIT will follow administration of the ESP measure, which would result in a very long session if the full HIT were used. Selection of cards will be discussed later.

Critical Consideration of the HIT

In general, critical response to the Holtzman Inkblot has been favorable, with accumulating data answering some of the early reservations. Sundberg (1962) concluded that the HIT possesses both the rich complexity of the Rorschach and the statistical precision of psychometric tests, although it has not removed much of the looseness of the Rorschach inquiry nor the susceptibility to examiner influence. No inquiry is needed for adequate scoring of Br and Pn, since these scores are based strictly on content. The question of examiner influence

is partly controlled by having the same examiner throughout, and will be further discussed below. Barclay (1962) noted that the research inquiries reported seemed encouraging and supportive of the view that the HIT offers:

> An alternative approach to the inkblot perception that circumvents the psychometic inadequacies [of the Rorschach] while retaining the unique projective approach to personality assessment. [It] provides for a single response to each blot, thus obviating the problem of variations in response total that has been a major source of annoyance. . . . The refinement of scoring criteria contributes to interobserver reliability while the analytic scrutiny of the response variables provides for an approach to an interpretive analysis. (p. 148)

Otter and Van de Castle (1963) found the HIT more sensitive to sex differences, more precise, more sensitive to covert tendencies, and that it tapped a greater number of factors than the Rorschach. Kobler and Doiron (1968) noted that the Holtzman has fared better when compared to cognitive, perceptual, and developmental measures than it has when related to personality questionnaires, ratings, behavioral measures and differential diagnosis. Intra-scorer and inter-scorer reliabilities were considered satisfactory, and the HIT has most successfully fulfilled the goal of developing a psychometrically sound, yet clinically valid and practical, inkblot technique. In a review of the literature from 1959 through 1969 (Gamble, 1972) it was stated that there is an improvement in reliability over other inkblot techniques.

> Interscorer correlations range from .89 to .995 when highly trained scorers are used to evaluate individual protocols. Even examiners whose training is limited to little more than a reading of the examples in the scoring guide produce interscorer correlations ranging from .73 to .89. Intrascorer consistency ranges from .89 to .97. . . . Other studies reinforce the significance of the body-boundary construct in personality research, and they tend to support the construct validity of the HIT Br and Pn scores. (p. 193)

That the HIT has been found to be useful is indicated by the 235 references compiled by Van Dyke (1972) covering the period 1956-1970.

The HIT in Relation to Context and Examiner Effect

Since the plan is to use the HIT in an experimental context, it is necessary to examine previous research which considers the effects this might have, as well as that of examiner effect. Block and Greenfield (1965) found that inkblots take on the qualities of the series as a whole and are also subject to the experimental context. Megargee, et al. (1966) found that examiner differences and conditions of test administration (neutral, positive, negative) did not significantly affect Barrier scores. Hamilton and Robertson (1966) found that a "warm" administration significantly influenced eight of the 22 response categories of the HIT, but the trends obtained on Br and Pn were not significant. Simkins (1960) found that content and determinant dimensions are equally

vulnerable to reinforcement effects with weak reinforcement (examiner nodding his head and saying "mm-hm") slightly more effective than strong reinforcement (saying "good" or "that's fine"). Herron (1962) found that when the HIT was administered under conditions designed to arouse achievement-motivation, the Pn score was significantly lower than under neutral conditions. Marivit and Marcia (1967) found that examiners' expectation of obtaining a high or low total number of responses resulted in major differences. Doris, et al. (1963) found that giving third graders more time and encouragement resulted in fewer rejections than occurred with a second-grade sample. This is of major import, since response total directly influences both Br and Pn (Fisher and Cleveland, 1958). It seems necessary for all subjects to be seen by the same examiner, under the same or equivalent conditions, and given similar instructions and feedback during testing.

Short Forms of the HIT

There have been some investigations of shorter forms of the HIT. Penk (1969) gave the first 20 cards of Form B to 7, 8, 9, 10, and 11 year olds. Results from both intra-scorer and inter-scorer correlation coefficients compared favorably with similar procedures in standardization of the HIT. Branton (1979) found that scores obtained from the first 20 cards of Form A correlated acceptably with those obtained from the

full 45 card version on 18 variables, but there were insufficient scorable responses for Space, Sex, Abstract, and Barrier. A different approach was taken by Newton (1970) who selected 25 cards from Form B of the HIT as being the cards most likely to elicit the Barrier response, on the basis of item analysis. This is similar to the procedure used in this research in which the ten highest Br cards and an additional ten high Pn cards (there is considerable overlap of the two groups) from Form A of the HIT were selected, for a total of 20 cards. This approach maximized the number of scorable responses for determining the Barrier minus Penetration (Br-Pn) score for each individual. Since the aim was to examine different subgroups within one experimental population, the loss of comparative validity that would result seemed less important than increasing the likelihood of obtaining the relevant data.

EXPERIMENTER EFFECT AND ESP

A consideration of examiner influence on Holtzman Inkblock responses leads naturally to a consideration of experimenter effect in general, and to its effect in ESP experiments in particular. This has become an area of increasing interest and has important implications for both the design of ESP experiments, and the conclusions that can be drawn from them.

Since the work of Rosenthal (1966) it has been clear that the results of some experiments can be directly influenced by the expectation of the experimenter. Attempts are made to control this by using double-blind procedures, and trying to control for psychological effects, but the experimenter effect still appears. When ESP experiments are considered, and the existence of ESP assumed, the situation becomes still more complex.

The quality of the relationship between agent and percipient (in telepathy or GESP experiments), or between experimenter and subject (in clairvoyance or precognition experiments) seems to affect the scoring level (Anderson and White, 1956; Pratt and Price, 1938; West and Fisk, 1953). Research has shown that although there is a correlation between mood and ESP success, the "best" mood varies depending on the experimenter, the group, and the circumstances of the experiment (Schmeidler, 1971; Schmeidler and Craig, 1972). Other variables that have been shown to affect scoring include:

sex of the experimenter, compatibility with the experimenter, the belief in ESP of the experimenter, and degree of acquaintance of agent and percipient (Palmer, in press). All of these cases, except for West and Fisk, involved direct interaction between subject and experimenter and it is likely that psychological effects of the interaction predominate.

There are data which suggest that there are also parapsychological components. Broughton (1977) found in a pilot study that subjects can influence their scores in a direction specified after the experiment (retroactive PK). A confirmatory study was run in precisely the same manner as the pilot study with forty fresh subjects. The results were nil. Broughton writes, "Rather than attribute this failure to replicate to gross differences either in the psi ability of the two groups of subjects or in the experimenter's ability to motivate them to use retroactive PK, it would seem more parsimonious to attribute the outcome to a psi failure on the part of a single person, namely the experimenter himself, for whom conditions between experiments may have changed considerably." (p. 176)

A striking difference in results was obtained in a series of experiments (Braud et al. 1976) when an experimenter was used who was naive with respect to the experimental hypothesis. In the first experiment, subjects were involved in nonanalytical, uninterpretive tasks in order to evoke "Mode 1"

functioning (formerly termed "right hemisphere" functioning by these experimenters). In other subjects, "Mode 2" functioning was evoked by engaging them in analytical, verbal, mathematical and logical tasks. While subjects were presumably functioning in these different modes, their psi performance was tested. Mode 1 subjects evidenced significant psi-hitting, Mode 2 subjects evidenced significant psi-missing, and there was a significant difference between the two conditions, as expected by the experimenters. Experiment 2 was conceptually similar to experiment 1. Twenty subjects attempted to influence an electronic random number generator while processing Mode 1 material, twenty while processing Mode 2 material. Experiment 3 was identical to experiment 2 with the exceptions that the experimenter was naive with respect to the experimental hypothesis and no physiological measures were taken. In experiment 2 there was significant PK hitting under Mode 1, chance performance under Mode 2 and a significant difference between the two conditions. In the experiment with the naive experimenter (3), however, the results were not significantly difference from chance.

Eisenbud (1963) noted that it seemed implicitly taken for granted that experimenters will not use any psi facilities they may have to muddy the field. This is no longer the assumption. In fact, it even appears that other persons involved with the experiment but not interacting with the subjects can

also influence scoring. In an experiment by West and Fisk (1953) half the packs of clock cards were prepared by Fisk, who generally obtained positive results as an ESP experimenter. The other half were prepared by West, who generally obtained chance results. Although the experiment was conducted by correspondence, there was highly significant positive scoring on the packs prepared by Fisk and only chance scoring on those prepared by West. Price (1973) found that scores on targets prepared by an assistant in a very negative mood were significantly higher than those prepared earlier and concluded "Any person connected with an ESP experiment may exert a significant influence upon the psi process." (p. 317)

In the one experiment that attempted to discriminate between the psychological and psi interpretations of the experimenter effect (Parker, 1977) it was found that there was no significant difference between successful and unsuccessful ESP experimenters on personality traits, but the successful experimenters were the only ones to score significantly above chance on a covert ESP test. Kennedy and Taddonio (1976) consider psi experimenter effects as a special case of unintentional psi, substantial evidence for which is presented by Schechter (1977). According to Kennedy and Taddonio (1976):

> Parapsychologists should face the fact that an experimenter is typically more motivated than his subjects to achieve successful results. Psychokinesis studies allow for experimenter PK to be the determining factor

> rather than subject PK and the successful PK experimenters are also successful PK subjects. In precognition studies, the experimenter may influence the target choice by affecting the dice or random-number generator. Experimenters may cause equipment failure or other errors which seem to be less than accidental. (pp. 5-6)

It seems that once ESP is hypothesized, it becomes necessary to recognize that even a blind or double-blind procedure can become contaminated. It is also possible that no matter how many subjects there are, the ESP being measured is predominantly that of the experimenter and the other associates in the experiment. Therefore, it seemed important here to use a design which makes the experimenter effect deliberate, and to record such variables as mood, attention, etc. for everyone involved in the experimental procedure as far as possible.

For this reason, a GESP procedure was used in this research. A clairvoyance procedure, in which the targets are concealed and randomized, provides better control of sensory transmission but allows for nonintentional ESP to operate. It had been suggested that conscious use of ESP (i.e., deliberately transmitting information) reduces the amount of energy available for nonintentional ESP. In addition, Kreitler and Kreitler (1973) found significantly greater success when the sender was instructed to "transmit" a target to another person than when instructed just to "think intensively" about the target. Finally, research indicates that children do better on telepathy (GESP) studies than with clairvoyance ones.

The general approach taken here was to control for everything that could be controlled, and try to measure everything that could not.

HYPOTHESIS AND EXPLORATORY QUESTIONS

The major hypothesis, in general terms, is that there will be a decline in mean ESP scores with increasing age. Specifically, a) there will be a significant decline in mean ESP score between grade one and grade three, b) between grade three and grade five, and c) grade five will score significantly lower than grade one.

The secondary hypothesis is that higher Body Boundary scores (Barrier minus Penetration) will be associated with lower ESP scores. Specifically, a) the higher Boundary subjects will score significantly lower on the ESP test than the lower Boundary subjects (lower Br-Pn). b) It is also hypothesized that there will be an interaction effect so that the combination of low age and low Boundary will result in significantly higher ESP scores than those associated with higher age and higher Boundary.

Although it is obvious from the preceding section on experimenter effects that this factor may override other variables, it is not clear enough an area to set forth definite hypotheses as to how this might happen. One aspect of this dissertation was an attempt to find correlations between a variety of qualitative differences in the experimenter, both during target preparation and time with the subject, and the scores on the ESP test. This will be more fully described in

the Method section.

Exploratory investigation of possible correlations between ESP scores and such variables as sex, timing of feedback, Armenian or not, order of testing, time of testing, and child's reaction, were also performed. Response bias, association of hits with lucky numbers, choice of marker color, and experimenter's estimate of Boundary score were also examined in relation to ESP.

It is also clear that if there was a parapsychological experimenter effect, the actual research may have involved repeated measures of the experimenter's ESP ability. This would be an alternate explanation of any differences found, and will be considered in the Discussion. Attempts were made to make this "sending" equal for all subjects, as was discussed in reference to the choice of GESP procedure, but this experiment is not designed to address that issue.

METHOD

Subjects

The subjects for this research were first, third and fifth graders from a public elementary school in a town near Boston. The final sample consisted of all the children seen who fulfilled the following criteria: in a regular class and within the age range for the grade (had not repeated or skipped grades); fluent in English; of at least average intelligence; without major physical, emotional, behavioral, or learning problems; and did not deny the possibility of "guessing the right number" for the hidden target ("sheep").

At the suggestion of the school principal, children were pre-selected for the first four characteristics by the guidance counselor, and only those who qualified were given parental permission slips (Appendix IV). All the children whose parents gave permission were seen for the experiment, a total of 127. Of these, four denied the possibility of guessing correctly ("goats"), six did not fit the selection criteria according to school records, and two others were considered to have major emotional problems based on the quality of the HIT protocols in the opinion of the experimenter and the second scorer (MGT). The results for these 12 were discarded without scoring the ESP test. The final sample consisted of 115 children, divided by grade and sex as follows:

TABLE 1

MALE AND FEMALE SUBJECTS IN FIRST, THIRD AND FIFTH GRADES

Sex	First	Third	Fifth	Total
Male	16	21	17	54
Female	17	19	25	61
Total	33	40	42	115

Experimental Materials

1) A cardboard screen (described in the procedure section)
2) Two cardboard shields, one to cover the target sheet and one to cover the child's answer sheet. Each shield had a cut-out so that only one clock could be seen at a time.
3) Five felt-tip markers: red, dark blue, turquoise, purple, and brown (the last not selected by any child).
4) ESP target sheets and answer packets. The ESP test was a variant of the Fisk-West clock card technique (West and Fisk, 1953) which had been used with children (Schmeidler, 1962). The target sheet consisted of fifteen clock faces, with no hands but with numbers at the usual points (Appendix I). The target sheets were prepared in duplicate. One number, determined by a computer-generated list of

random numbers from one through twelve, was circled on each clock face. The original was in the researcher's possession. The copy was placed in a manila folder and then inside an opaque envelope. An answer sheet (fifteen clocks) was stapled onto the outside of the envelope, approximately above the target sheet. The subject code appeared on all three sheets.

5) Holtzman Inkblot cards, 20 from Form A. The cards were 15, 18, 21, 23, 27, 29, 30, 33, 40, and 41 (the ten highest Barrier cards by Item Analysis, see Appendix II) and 3, 6, 7, 9, 12, 14, 26, 31, 34, and 35 (the highest Penetration cards not in the first ten). Cards 12 and 35 were used rather than 8 because the Br score for 8 is slightly higher, so the others were more likely to "pull" Pn. Cards were administered in numerical order following the two practice cards, X and Y.

6) Protocol packets. Two sheets of lined paper with a piece of carbon paper between them, stapled together. Responses were recorded with a ball-point pen.

Procedure

Each child was seen by the experimenter under the same conditions except for date and time of day. Children were not seen during lunch, recess, gym, music or art periods and this schedule was used to determine which class would provide

subjects for each time period. In addition, children were not seen during the scheduled time if a special activity was taking place. Variations from the schedule below (Table 2) were frequent towards the end of the data gathering (May-June 1979) as a result of class trips and longer outdoor recess periods, finishing with some classes and substituting others, and the experimenter's attempts to keep the subjects seen approximately even by grade and sex.

TABLE 2

SCHEDULE OF CLASSES BY TIME AND DAY

Time	Tuesday	Wednesday	Thursday	Friday
9:00 AM	3-109	1-104		3-114
9:30	3-109	3-114	5-213	5-211
10:00		3-114	5-213	1-104
10:30		3-105	5-209	1-104
11:00				
11:30	5-209		5-211	5-209
12:00 PM	1-103	3-105	1-106	1-108
12:30	1-103	3-105	1-106	1-108
1:00	3-105	5-211	3-107	1-108
1:30	3-105	5-211	3-107	1-108

The order within each class was determined by the teacher and tended to be more or less alphabetical, with some skipping around occurring if the next child alphabetically had work to complete or if the experimenter requested a boy or girl specifically.

All children were seen in the same room (the Science Laboratory). On the side away from the windows, two desks were arranged eight feet apart. The larger (adult-sized) desk had a cardboard screen on top. This was made by cutting the bottom, one long side, and half of the top from a cardboard carton and resulted in a screen 11 inches high with three sides and half of the top covered. Before going to pick up the next subject, the experimenter taped the target sheet for the ESP test to the desk, placed the two cardboard shields and the answer packet on top of it (see Materials), and put the screen around the material. Since the child was instructed to sit at the student desk, which was closer to the door, upon entering, it was unlikely that any of the children saw behind the screen. Even if they did, all they would have seen was the blank answer sheet on top of the packet. Preparations for the next subject did not begin until the preceding child left the room.

The experimenter went to the classroom to pick up each child. During the walk to the Science Laboratory the child was told that he or she would be doing something like guessing games and that the exact instructions would be given in the room, since it was easier to explain if he or she could be shown the materials at the same time. The child was then either engaged in casual conversation, or there was silence, depending on what seemed comfortable. All the children were

assured that this was not a test and had nothing to do with their grades.

Upon entering the room, the child was asked to sit at the student desk for the first part. The experimenter then went to the other desk, picked up the answer packet, one cardboard shield, the bunch of five felt-tip markers, and a chair, brought them over to the child's desk and arranged them and sat down. Pointing to the answer sheet, the experimenter asked, "Do these look like anything to you?" If the child answered "clocks" or "numbers", the experimenter responded, "That's right" and went on. If "yes", the child was asked "What?", the response came, and the procedure continued. The next statement was: "There is another sheet of paper behind that screen (pointing) and the same thing inside this envelope (pointing). They are just like this one, except for one thing. On the other sheets, each one of these clocks has one number circled. Do you understand that?" (The experimenter went on if the child claimed to understand, and explained further if there seemed to be lack of comprehension.) "The numbers circled aren't in any special kind of order. They are all mixed up and any number could be the right answer more than one time, one time, or not at all." (This was also explained, with examples, until the child seemed to understand.) "What I want you to do is to try to guess the right number for each clock and put a circle around it. Do you think it's

possible to guess them right?"

If the child said "no" the experimenter asked why, but noted the subject down as a "goat." Children who said "maybe, some of them, yes" or some variant of these were included as "sheep." Children who shrugged or said they didn't know were asked to choose between "yes, no, or maybe," and classified on the basis of their answer. Prior to the end of March (first 39 children) the remaining instructions were: "I'm going to put this (cardboard shield) so that only one clock shows at a time. After each one, I will come over and give you some idea how you did on that one. The important thing to remember is that each one is separate, the answer to one has nothing to do with the answer to the next one. What color would you like to use to circle your answers?" The child then selected a marker and the instructions finished: "You can start with each one as soon as I'm back behind that desk." The experimenter then walked behind the desk and looked at the first target. If the child seemed to hesitate, he or she was told to start. Repetition of the instructions and encouragement to "just guess" was given as needed.

Based on the experimenter's observations, a slight change in procedure was made starting in April (a three-week break occurred for various reasons). It seemed that some children were basing their guesses on the feedback to the previous target, others seemed to become frustrated at repeatedly

guessing wrong, and some seemed to react to a hit by circling the number furthest from the target the next time (apparent psi-missing). It was decided to offer delayed feedback (at the end of all fifteen targets) as well and approximately half the children in each grade were given immediate feedback, half delayed. For subjects in the delayed feedback (DF) condition, the instructions were: "After each one I will come over to make sure I can tell clearly which one you've circled. At the end, we will go over them and see how you did." The remaining instructions were the same. To try and make the experimenter-subject interaction otherwise equivalent, as well as going over after each one, the experimenter said something like "that's clear, now the next one, on to the next row, etc." All children were told when they reached the last row, and when they reached the last target.

The kind of feedback given was the same for all subjects, in both feedback conditions, the only difference being when it was given. If the child guessed correctly, the experimenter said, "that's right." If the answer was one to three away in either direction, "that's close." If more than three away, the child was told "that one's kind of far." At the end of the ESP test, every child was told that they had done quite well and assured that it was very difficult to guess them right. The child was then asked to come sit next to the experimenter (behind the big desk) for "the next thing," if

the child had been given immediate feedback. Children given delayed feedback had been seated behind the big desk for going over their ESP scores.

The instructions for the Holtzman Inkblot Technique were a combination of the standard instructions (Holtzman, 1961) with additional encouragement and time in case of a rejection (Doris, et al., 1963), with some additional modifications for use with children. Since many children are not familiar with inkblots, the term "design" was used. Instructions were not verbatim, in order to avoid stiffness, but were approximately as follows for all the children.

> "This is also like a guessing game, but there are no right or wrong answers for this one. I have some cards here and each card has a design on it. What I'd like you to do is to look at each card and tell me what it looks like to you. Just one thing for each card. I'll write down what you say, and I'll hand you each card so that you don't get ahead of me."

Any further instructions, such as about turning the card or using the whole thing, received the reply, "That's up to you." Responses of "a design" received "But what does it look like" until a scorable response was obtained. With patient repetition of "Remember, there are no right or wrong answers" and allowing children to take their time, the result was that there were no refusals. The only inquiry was to clarify the response as to content, since that was all that was needed for the Barrier and Penetration scoring. The same 20 cards (see

Materials) were used with each child.

Responses were recorded in duplicate and at the end each child was told he or she has done very well and thanked for helping out. The child then returned to the classroom and the experimenter set up for the next subject.

Scoring of HIT

The HIT protocols were scored by the researcher and a second clinician (MGT). Training involved scoring and re-scoring the sample protocols in Fisher (1958), following the revised scoring (Appendix III). Additional practice was obtained scoring protocols from discarded subjects. Discrepancies were examined to determine if there was agreement on the verbatim language of the response, since handwritten protocols were used. The experimenter's version was accepted as final in these cases. After resolving these differences, a record was made of the discrepancies between the two sets of scores, for the purpose of establishing inter-scorer reliability. Disagreements were then resolved by consulting the scoring criteria (Appendix III) and discussion. The experimenter may have had a vague recollection of the ESP scores but tried not to let this influence scoring of Br and Pn. The second scorer (MGT) had no knowledge of the children's age or sex since only the subject code appeared on the protocol. Protocols were scored at the end of every one to two weeks

throughout the data gathering period.

At the end of the training period, interscorer reliability for the Barrier and Penetration scoring was .92. Reliability with the training material (Fisher and Cleveland, 1958, Appendices) was .97 for MGT, .96 for SS. The interscorer reliability for the experimental data was .992. All discrepancies were resolved by discussion between the two scorers. Most initial disagreements were due to careless reading of the scoring criteria (consulted throughout) by one of the scorers. Responses not specified in the Fisher and Cleveland material were scored based on mutual agreement in light of the general scoring principles.

Scoring of ESP

The ESP answers were scored about halfway through by WEH and again towards the end. The scorer for the final batch was MGT since WEH was not available. Since both scorers claimed they had felt about the same while scoring all of the answer sheets, no record of their mood, state, or interest level was kept although this had originally been planned. After the decisions were made as to discarding subjects, the researcher did a second set of record sheets for the ESP test. For each child, the list of target numbers was transcribed from the target sheets, and the corresponding answers from the answer sheets. Finally, the two scorers reconciled the

data and the final set was put on IBM keypunch cards. A second card was made for each subject with identifying data, Br and Pn scores, and additional information. Only the researcher saw the child's name since subject codes were used.

Other information was recorded at various points in the experimental preparation, during and after the actual research. An attempt was made to quantify aspects of the experimenter's and subjects' functioning on several scales of affect (see Appendix V). Values of one through six were assigned, with one being the positive end of the scale and six being the negative. During target preparation, the experimenter recorded Mood (Good-Bad), State (Rested/Healthy-Tired/Sick) and Interest (Involved-Bored) for each batch of target sheets. After seeing each child, the same information plus the experimenter's Feeling of Rapport (Good-Poor) was recorded for the session. The teachers were asked to have each child indicate a composite reaction (Liked-Disliked) on a one through six scale as well. In practice, this last was least reliable since for some subjects this was recorded immediately after the session and for some it was recorded after several months by a substitute, with a wide range of procedures in between.

The experimenter also recorded an estimate of Br-Pn level (high, medium, or low). Subjects seen after March 22, 1979 were also asked if they had a favorite or "lucky" number (stimulated by the spontaneous comment of one child that her

hits were her lucky number). Occasionally anecdotal or descriptive comments were also recorded on the subject's card after the session.

RESULTS

Three age groups were involved in this study (see Table 3). Although each group has a fairly wide range (one year and two months for the first and third grades and one year and six months for the fifth grade) there is a gap of ten months between the oldest first grader and the youngest third grader, and a gap of seven months between the oldest third grader and the youngest fifth grader.

TABLE 3

SUBJECTS: SEX AND AGE IN YEARS AND MONTHS

Grade	Total	Girls	Boys	Mean Age	Min. Age	Max. Age
First	33	17	16	6.11	6.3	7.5
Third	40	19	21	9.0	8.3	9.7
Fifth	42	25	17	10.11	10.2	11.8

Primarily in order to determine whether a stratified sampling technique would be needed for determining high and low Body Boundary groups, a series of t-tests were done on the means for boys and girls on Barrier (Br), Penetration (Pn) and Barrier minus Penetration (Br-Pn). With a two-tailed test (used throughout) at the .05 level with 113 degrees of freedom, none of the differences were significant, so the sexes

were pooled for further analysis. There was also no significant difference between boys and girls for mean number of ESP hits (see Table 4).

TABLE 4

DIFFERENCE OF MEANS FOR BARRIER, PENETRATION, BARRIER MINUS PENETRATION, AND HITS BY SEX

Variable	Sex	n	Mean	df	t	p
Br	Boys	54	4.7778	113	0.83	n.s.
	Girls	61	4.3934			
Pn	Boys	54	1.2778	113	0.73	n.s.
	Girls	61	1.0492			
Br-Pn	Boys	54	3.5000	113	0.31	n.s.
	Girls	61	3.3443			
Hits	Boys	54	1.5000	113	1.36	n.s.
	Girls	61	1.2295			

A distinguishing feature of the town population is the large number of Armenians, many of whom are in the school district of the subject school, or attend due to the Armenian-English bilingual program offered only at this school. The t-test indicated that there was no significant difference between the mean number of hits for Armenian versus non-Armenian children, so the two groups were pooled for further analysis. There was also no significant difference between either group mean or

the overall mean number of ESP hits and chance (Table 5).

TABLE 5

ESP SCORES OF ARMENIANS AND NON-ARMENIANS

Group	Mean	df	t	p
Armenian	1.455	113	1.010	n.s.
Non-Armenian	1.346			
Armenian	1.455	10	0.643	n.s.
Chance	1.250			
Non-Armenian	1.346	103	0.958	n.s.
Chance	1.250			
All	1.357	114	1.073	n.s.
Chance	1.250			

The only procedural difference in treatment of subjects was that some were given feedback after each ESP response (Immediate Feedback or IF) and some were given feedback at the end of the ESP test (Delayed Feedback or DF). There was no significant difference between the ESP scores of the two groups.

TABLE 6

DIFFERENCE OF MEAN ESP HITS WITH TYPE OF FEEDBACK

Feedback	n	Mean	df	t	p
IF	59	1.27	113	-0.88	n.s.
DF	56	1.45			

An examination of the difference between the mean number of ESP hits for each grade and the number of hits expected by chance showed that the first graders scored significantly above chance, the third graders scored at chance, and the fifth graders scored insignificantly below chance. Chance expectation was 1.25.

TABLE 7

DIFFERENCE OF MEAN ESP HITS FROM CHANCE BY GRADE

Grade	Mean	df	t	p
First	1.697	32	2.079	.025
Third	1.250	39	0.000	n.s.
Fifth	1.191	41	-0.418	n.s.

Results in terms of original hypothesis

The major hypothesis, that there will be a significant decline in ESP scores (mean number of hits) with increasing age was confirmed (Table 8). The second hypothesis, that the subjects with higher Boundary scores (i.e. Barrier minus Penetration scores) would score significantly lower on the ESP test than the subjects with lower Boundary scores was not confirmed. There was no significant interaction effect (low age and Low Boundary did not result in significantly higher ESP scores than those associated with high age and High Boundary). A two-way Analysis of Variance was performed.

TABLE 8

ANALYSIS OF VARIANCE:
HITS BY GRADE AND BARRIER MINUS PENETRATION

Source	df	MS	F	p
Main Effects	17	1.714	1.543	.100
Grade	2	4.030	3.628	.031
Br-Pn	15	1.580	1.422	.157
Grade X Br-Pn	15	0.677	0.609	.859
Explained	32	1.228	1.105	.351
Residual	82	1.111		
Total	114	1.144		

A series of paired t-tests was then performed, in order to further examine the decline of scores with age. A suggestive difference was found between the mean number of ESP hits for grades one and three. The difference between mean hits for grades three and five was insignificant. There was a significant difference between the means for grades one and five, in the predicted direction.

TABLE 9

DIFFERENCE OF MEAN ESP HITS BETWEEN GRADES

Grade	Mean	df	t	p
1	1.697	71	1.68	0.097
3	1.250			
3	1.250	80	0.28	n.s.
5	1.191			
1	1.697	73	2.04	0.045
5	1.191			

An exploratory analysis was also done to determine if either Barrier or Penetration scores separately related to the ESP score. The results of the two analyses of variance performed (Tables 10 and 11) indicated that there was no significant relationship with hits when Br and Pn were used separately, rather than as a combined score (Br-Pn, Table 8).

TABLE 10

ANALYSIS OF VARIANCE:
HITS BY BARRIER WITH GRADE AND ARMENIAN

Source	df	MS	F	p
Covariates	2	2.324	2.083	0.130
Grade	1	4.531	4.060	0.047
Armenian	1	0.186	0.166	0.684
Main Effects	12	1.178	1.056	0.405
Barrier	12	1.178	1.056	0.405
Explained	14	1.342	1.202	0.286
Residual	100	1.116		
Total	114	1.144		

TABLE 11

ANALYSIS OF VARIANCE:
HITS BY PENETRATION WITH GRADE AND ARMENIAN

Source	df	MS	F	p
Covariates	2	2.324	2.035	0.136
Grade	1	4.531	3.968	0.049
Armenian	1	0.186	0.162	0.688
Main Effects	7	0.832	0.728	0.648
Penetration	7	0.832	0.728	0.648
Explained	9	1.164	1.019	0.430
Residual	105	1.142		
Total	114	1.144		

For exploratory purposes (see Discussion), the high scorers were looked at in terms of some identifying characteristics (see Table 12).

TABLE 12

HIGH SCORERS: PROBABILITY OF SCORE AND BREAKDOWN BY SEX, AGE DATE OF TESTING AND IF ARMENIAN

ESP Score	p of Score	#	Sex	Age	Date of Testing	Armenian?
3	0.093	9	M	6y9m17d	2/2/79	No
			M	6y9m	5/3/79	Yes
			M	6y9m13d	5/18/79	No
			M	9y1m11d	5/1/79	No
			M	8y4m27d	2/9/79	No
			M	11y4m15d	5/25/79	No
			M	11y8m	5/22/79	No
			F	7y4m 7d	2/9/79	No
			F	10y3m28d	3/6/79	No
4	0.025	5	M	7y3m 9d	5/15/79	No
			M	7y3m23d	2/9/79	No
			F	6y7m21d	5/9/79	No
			F	6y10m	2/8/79	No
			F	10y9m 8d	6/5/79	No
5	0.005	1	M	9y2n 3d	5/31/79	Yes

In order to explore the possibility of a decline effect over the course of the experiment, a two-tailed t-test was performed on the mean number of ESP hits of subjects seen between 2/2/79 and 3/23/79 and the mean for subjects seen between

4/26/79 and 6/7/79. There was no significant difference between the mean of the first group and that of the second (see Table 13).

TABLE 13

DIFFERENCE OF MEAN ESP HITS
BETWEEN EARLY AND LATE GROUPS

Group	n	Mean	t	df	p
Early	41	1.4390	0.61	113	n.s.
Late	74	1.3108			

For exploratory purposes (see Discussion) an additional breakdown was done for the high scorers by date (Table 14).

TABLE 14

HIGH SCORERS BY DATE WITH TOTALS BY TIME PERIOD

Time Period	High Scorers	Total	1st Grade	3rd Grade	5th Grade
2/2/79-2/9/79	5	29	14	6	9
2/13/79-3/23/79	1	13	6	3	4
4/26/79-5/16/79	3	22	7	8	7
5/18/79-6/7/79	6	51	6	23	22

An exploratory analysis was done to see if the number of hits related to various other factors recorded during the course of the experiment. There were no significant correlations found, as can be seen by examining Table 15. The only apparently suggestive relationship (between tester mood and hits) did not hold up when further analyzed by chi square. The chi square value of 6.6616, df=10, was not significant.

TABLE 15

PEARSON CORRELATION COEFFICIENTS FOR HITS AGAINST OTHER FACTORS RELATING TO EXPERIMENTAL CONDITIONS

Factor	Corr. Coeff.	p
Order of testing	0.0907	n.s.
Time of testing	-0.0115	n.s.
Child's reaction	0.0515	n.s.
Tester mood	0.1207	0.099
Tester state	0.0327	n.s.
Tester interest	-0.0509	n.s.
Tester rapport	-0.0385	n.s.
Target preparer mood	0.0032	n.s.
Target preparer state	0.1057	n.s.
Targer preparer interest	-0.0511	n.s.

Examination of the data did not indicate any other relationships worthy of further statistical analysis.

DISCUSSION

Age and ESP

The results presented in Table 8 confirm the major hypothesis, that there is a significant decline in ESP scores (mean number of hits) with increasing age in the elementary school children studied. The subsidiary to this hypothesis was a) there would be a significant decline in ESP scores between grades one and three; b) a significant decline between grades three and five; and c) grade five would score significantly lower than grade one. This received partial confirmation (see Table 9). Third grade children had a mean ESP score suggestively lower than that of the first graders. The difference between mean hits for grades three and five was insignificant. The mean for grade five was significantly lower than that for grade one.

Examination of the data (Table 7) showed that first graders scored significantly above chance as a group, while the means for third and fifth graders were not significantly different from chance. So, not only do the youngest children in this sample demonstrate more ESP ability than the older children, they also demonstrate the ability to make more "hits" than could be expected by chance alone. Also noteworthy, of the fifteen high scorers (Table 12), eight were first graders while three were in third grade and four were in fifth grade.

Clearly, the 6-7 year olds did better on the ESP test than did the 8-9 and 10-11 year olds.

Accounting for this decline in ESP ability was not within the scope of this investigation, but it is important to consider some possible explanations for this trend. At this point it seems that the reason might be "nature" (an inborn developmental trend), "nurture" (socialization effects), or some degree of interaction between the two. Some previous researchers (Peterson, 1975; Spinelli, 1977) suggested that the sort of cognitive development described by Piaget may be associated with a decline in ESP ability. It is unclear whether they are suggesting this means that there is an inborn "program" in which development of logical thinking is necessarily associated with loss of ESP.

There is an explicit refutation of the theory that cognitive development is totally pre-determined in Piaget's own work, however (Inhelder and Piaget, 1958, p. 337)

> In sum, far from being a source of fully elaborated "innate ideas," the maturation of the nervous system can do no more than determine the totality of possibilities and impossibilities at a given stage. A particular social environment remains indispensible for the realization of these possibilities. It follows that their realization can be accelerated or retarded as a function of cultural and educational conditions.

The authors also note (Piaget and Inhelder, 1969, p. 117)

> The process of socialization is progressive rather than regressive. In spite of the appearance of individuality tending toward autonomy, the child of seven and over is more socialized than the self of early childhood which is in interdependence with others. The initial social interdependencies before seven actually attest to a minimum of socialization, because they are insufficiently structured.

In summary (Richmond, 1970, p. 83)

> The following social factors are regarded by Piaget as having an effect upon structure formation:
>
> 1. The language used in society.
> 2. The beliefs and values held by society.
> 3. The forms of reasoning which a society accepts as valid.
> 4. The kind of relationships between members of a society.

My own inclination is to look at the effects of socialization rather than assuming the decline in ESP is due to neurological maturation. (Some suggestions for exploring this will be found in the section on Future Research.) It is possible that a temporary loss of ESP abilities may be necessary in order for logical abilities to develop and be exercised, but it seems that the abilities are never recovered (Palmer, in press; Spinelli, 1977). I believe this is due to living in a society and undergoing an educational process which rewards rational deductive thinking but gives little encouragement to the development of intuition and sensitivity. Although "development of the individual" is articulated as the goal, in practice the successful ones are those who make the highest

achievements in acceptable endeavors. Along with this general trend, the derogation as "superstition," "fuzzy-mindedness," and "mysticism" of belief in phenomena which are still controversial in the scientific community serves to discourage talents in this area. Perhaps if ESP abilities were not so weak, they would not be so subject to external influences.

Comparison with previous research on age and ESP

These results are similar to the ones obtained by Spinelli (1977) and Van Busschbach (1959) which also demonstrated a decline of ESP score with age. The other studies which involved an ESP test administered to normal children of different ages (Anderson and McConnell, 1961; Musso, 1965; Van Busschbach, 1961; White and Angstadt, 1961, 1963) did not obtain any significant difference with age. All experiments in this second division used group administrations of the ESP test, as did the 1959 Van Busschbach study of Dutch schoolchildren.

Spinelli tested children in pairs and children were tested individually in the experiment reported here. It seems possible that the individual attention may enhance the performance of the children on the ESP test. Alternatively, the group administration may have a negative effect on ESP scoring which is stronger than the decline effect associated with age. It is difficult to account for the significant results obtained

by Van Busschbach (1959) with a group administration to first and second grade Dutch children. Perhaps the atmosphere in the Dutch schools and the class size were sufficiently different from that in American schools to account for the different results Van Busschbach obtained. On the other hand, the results of my study would not incline me to predict a significant difference between first and second graders unless the sample size is larger than mine was. Unfortunately, Spinelli (1977) included the 5-8 year olds in one group, so comparison on this point with his study is not possible.

Alternate explanations of the ESP score decline

The experimental arrangement here was designed within the bounds of room and personnel limitations and to facilitate rapport with the children. As a result, there was two-way visual and auditory communication potential between me and the children.

It is possible that an unconscious nonverbal cuing occurred which guided the children's responses. It is likely that the youngest children would have been most responsive to such subtle cues according to Piaget's theory of moral development, since they are most invested in conforming to adults' expectations. This is hard to dismiss since if it had occurred, I would not have been aware of it! I think it unlikely, however, for two reasons. The first is that while the child

was circling a response, I kept my eyes on the target and only rarely looked up before the child was finished. In fact, some children went on to the next target while I walked back to my desk and I had my back to them while they responded. The second reason is that the children were far enough away and the angle of viewing was such that I could not see which target was circled until I walked over to them, which only occurred after the response had been made.

There is one alternate explanation that remains for consideration. Although I made a strenuous effort to concentrate equally on each target and for each child, it is possible that if experimenter ESP was involved it was affected by knowledge of the child's age. Thus, the results could be seen as indicating that experimenter telepathy is more effective with younger children and declines in line with the experimenter's expectation. Some evidence against this as an explanation, however, comes from Spinelli's (1977) study which had results of greater statistical significance using children as both "senders" and "receivers." While that study did not report on the children's expectations, the conversations I had with my subjects indicated that children generally think that "big kids" do just about everything better than "little kids." On the other hand, Spinelli expected a decline with age, as I did. A study by Jacobs, Michels, and Verbraak (1978) tested the effect of experimenter expectancy on PK. One group of

experimenters (the investigators) expected that children would obtain the highest scores, adults the lowest scores, and aged subjects in-between scores. A second group of experimenters was induced to expect that adults would obtain the highest scores, children the lowest, and aged subjects in-between scores. In addition, the first group expected female subjects to score higher than males, while the second group expected the opposite. The results did not confirm the hypothesis that the subject's scores are in accordance with the experimenter's expectancies with regard to them. This is additional evidence against expectation as the cause of the decline.

Sex Differences with Barrier and Penetration Scoring

Unlike previous findings (Morton, 1965; Gordon, 1964) this study did not find a significant difference between boys and girls on Barrier and Penetration scores (Table 4). The Morton study was of older children, but the Gordon research covered two of the same age groups (six and nine year olds). The major difference was that Gordon used the complete 45 card Holtzman Inkblot Test. For this research, only 20 selected cards were used. It is possible that the cards that were not used are the ones which are most sensitive to sex differences and so this effect was wiped out in this study. Since there was no difference, the sexes were pooled for

analysis of the relationship of Barrier minus Penetration with ESP scores.

ESP and Barrier minus Penetration

Unlike the research with college students (Schmeidler and LeShan, 1970), this study found no relationship between Barrier minus Penetration scores and ESP. The secondary hypothesis, that the subjects with higher Boundary (Br-Pn) scores would score significantly lower on the ESP test than the subjects with lower Boundary scores was not confirmed. There was no significant interaction effect between age and Boundary scores (Table 8).

It is possible that the age effect was strong enough to overcome any effect associated with this personality measure and a study of a larger number of children in one age group might obtain different results. More likely, however, is that this is not a good personality measure to use in ESP studies with children. Although previous research has demonstrated associations with personality and ESP in both adults and children, these generally have been more global types of measures. Attempts at using more specific measures than "anxiety," "defensiveness," "neuroticism," "extroversion," etc. have generally been, like this one, unsuccessful.

Although it was not part of the original hypothesis, Barrier and Penetration scores were also looked at separately to

see if there was a relationship with the ESP scores. It seems that future studies of the relationship of ESP and personality in children would do better to employ other personality measures than Barrier and Penetration scores.

Experimenter effect

Despite the growing evidence of experimenter effect in ESP research, none of the measures in this experiment were associated with a significant difference in ESP scores (Table 15). No analysis was done for correlations associated with the second ESP scorer because he claimed to maintain the same mood, interest and state during his scoring sessions.

One possibility is that this lack of relationship is due to the lack of variation in some of the measures and if finer distinctions had been made some differences might have been found. The child's reaction score was extremely unreliable since different teachers obtained it at varying intervals after the children were seen, including one teacher who did not do it at all so that a substitute queried all the children in that class on the last day of the experiment. For the present, it is reasonable to conclude that the ESP scores were not affected by any of the experimenter-related aspects measured.

There was also no significant difference between ESP scores of the children seen toward the beginning of the experiment and those seen at the end. It had seemed possible

that an "experimenter-fatigue" effect might exist, but this was not the case (Table 13).

If there was any association with the time when subjects were seen, it might be more of a U-shaped curve, with an increase of high scorers as the end of the research came into view (Tables 12 and 14). The confounding factors of total number of the subjects and grade distribution make this hard to determine, but it might be worth investigation.

Effect of feedback

The difference between subjective impressions and statistical analysis is demonstrated by the lack of significant relationship of ESP scores to immediate versus delayed feedback (Table 6). It had been my impression that the children were being affected by the feedback they were given, but this did not prove true here. It is possible, of course, that there were not enough trials per subject for a learning effect to show up.

Performance style of high scorers

In general, the high scorers were not distinguished objectively or behaviorally from the rest of the children except for the predominance of first graders in this group. The one exception was the third grade boy who was the only child to get five hits on the ESP test ($p=.005$, Table 12). This child

was outstanding for the amount of time he deliberated over each response, both on the ESP test and on the Holtzman Inkblot. The session with him took nearly twice as long as the average experimental session. This raises the question of whether the instructions should encourage children to "take your time and consider each answer" rather than "just guess." It is also possible that this child's response style developed from his access to additional, paranormal sources of information rather than being the cause of enhanced ability. It is also possible, of course, that this performance was a fluke rather than a demonstration of generally high ESP ability.

Suggestions for Future Research

The most obvious follow-up to this study would be an exact replication of this procedure using kindergarten, second, fourth, and sixth graders. The results obtained in the study reported here would lead to a prediction of a decline effect across these age groups as well but it is possible that the decline is not a steady one.

Another important follow-up would be a replication with the same age sample by a different experimenter. A variation of this might be to compare the results of two experimenters who were pre-selected so that one demonstrated ESP ability and the other did not. With all other aspects of the design

equivalent, the results of such a study might help to clarify the amount contributed by experimenter ESP.

A different approach to the same issue would also provide safeguards against accusations of intentional or unintentional cuing of subjects. Such a design would require two adults, one of whom would act as agent while the other accompanied the child. The agent would have to be in a separate room or behind a partition so that neither the child nor the agent would see the other. The assistant would have no knowledge of the targets and so could not give any information to the subject. The agent would be blind to the age of the child at each session. The presence of a second person and the hidden agent would introduce enough variation so that this could not be considered a replication, but it would be a study that was better controlled than this one in terms of preventing both normal and paranormal experimenter effect.

For further investigation of the mechanism of ESP, a variant of the above procedure might be used in which the children acted as agents, with the hidden adult acting as percipient. The adult percipient should be pre-selected for ESP ability, although it might be interesting to have an additional percipient pre-selected for lack of ability and compare the results. In this, as well as the other studies suggested, only "sheep" (those who allow for the possibility of ESP) should be included unless the design incorporates a way

of factoring out the "sheep-goat" effect.

Another variant might be to use emotionally stimulating targets or a more active, game-like procedure. Either of these might be useful in obtaining results of greater statistical significance. It might also be possible to incorporate into any of the above studies (except for a replication) an investigation as to whether encouragement for a quick or a considered response makes a difference, or whether there is a correlation with the child's preferred response style as determined before the child is given the results.

It might also be interesting to further investigate the effect of agent interest/fatigue over the course of the experiment. For this purpose, it might be best to use just first-graders and keep the agent blind as to the real purpose of the experiment. Both mean scores and occurrence of high scorers should be tracked against various measures related to both the agent and the experimenter, as well as when the subjects are seen.

The most important aspect for future research is probably the determination of underlying causes for the decline of ESP with age in children. The ideal solution would be to replicate this study with samples of children from societies which support and value the development of ESP abilities. Unfortunately, most such societies have succumbed to the educational systems of the dominant Western culture. While there is some

current anthropological evidence of acceptance of ESP among Austrialian aborigines, this does not seem to be a practical alternative. There may be, however, small groups of children being raised in communities which emphasize spiritual and mystical growth. While ESP abilities may not be actively encouraged, they are less likely to be discouraged than in ordinary schools and communities. At least one of these communities operates a school which is open to children from the surrounding area. It would be particularly interesting to compare these two groups of children (the residents and non-residents) with other children in the area who attend regular schools.

Another approach might be to compare children who attend special schools, such as those based on the teachings of Rudolph Steiner, with children from similar backgrounds who attend other kinds of schools. I would expect that to the extent children are exposed to the values of the larger society, they will show the decline of ESP with age found here.

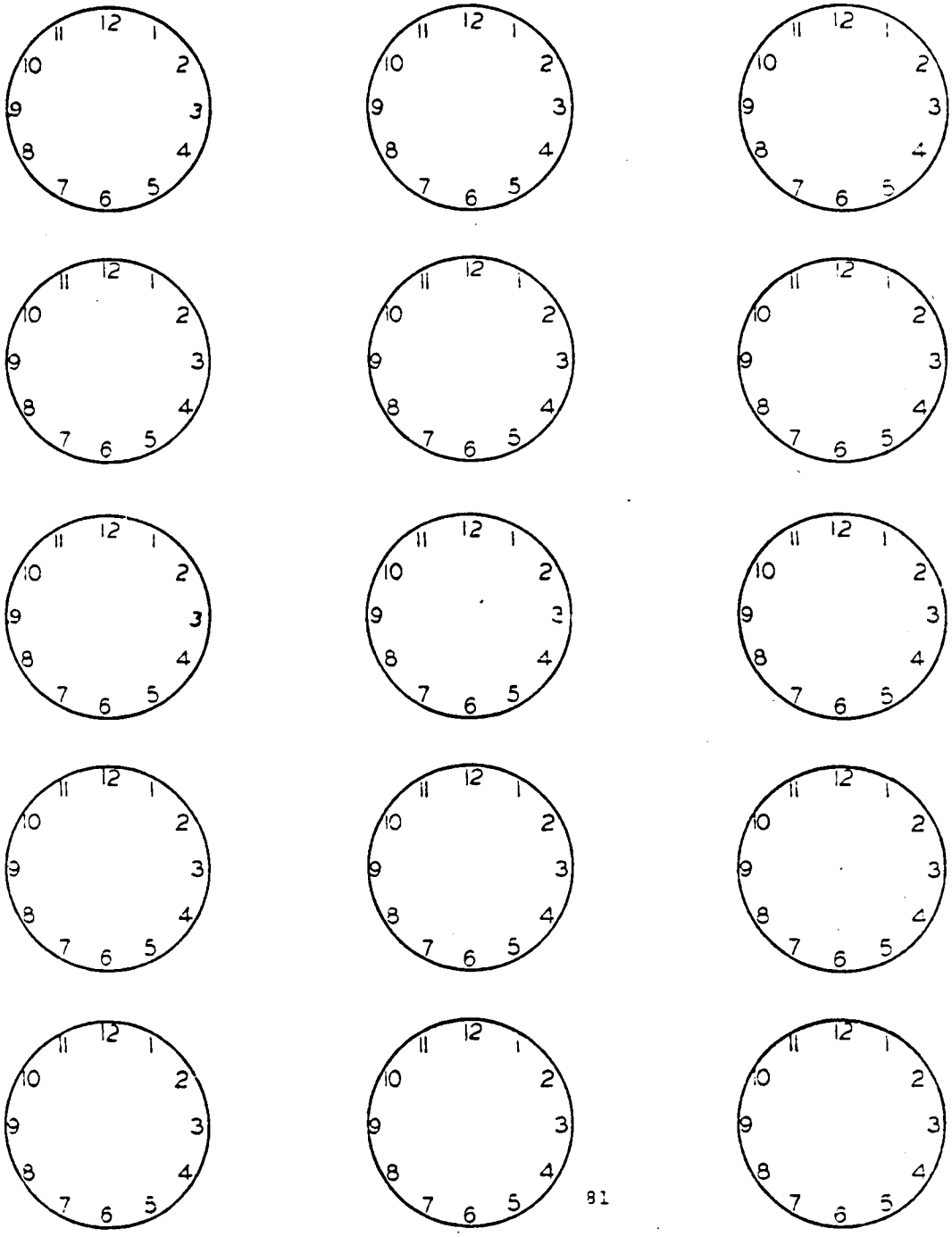
A totally different approach would be to study a group of adults who are not only supported in the development of intuitive abilities but whose success depends in part on their ability in this area: i.e., psychotherapists. The ideal comparison group would be adults with equivalent amounts of psychological knowledge and personal psychotherapy, but such a control group might be difficult to obtain. Just to compare

the mean for a group of psychotherapists against chance would be interesting, and I would expect above-chance results. In order to investigate the question of the effects of self-selection versus training, it might be useful to compare trainees against experienced therapists, perhaps with comparison groups of the same ages from other segments of the adult population. This study might well use both verbal and visual targets and would be most likely to be significant with emotionally arousing materials.

The area of parapsychology is presently characterized by studies remaining to be done, facts to be determined, and the lack of theory to account for the phenomena, rather than being an area that is flooded by research. It is psychology's equivalent of pioneer territory and may be an area which requires the joint efforts of many disciplines in order to obtain conclusive answers.

TARGET CODE _____ SUBJECT CODE _____

APPENDIX I



APPENDIX II

Card No.	Barrier 1	Penetration 1
1A	15	10
2A	11	8
3A	11	15
4A	11	9
5A	12	4
6A	17	14
7A	14	22
8A	17	11
9A	17	14
10A	11	9
11A	12	12
12A	15	11
13A	3	4
14A	11	19
15A	21	10
16A	11	9
17A	17	6
18A	24	9
19A	10	3
20A	13	9
21A	27	4
22A	18	5
23A	29	15
24A	16	6
25A	13	2
26A	17	18
27A	21	3
28A	17	8
29A	21	15
30A	34	12
31A	8	13
32A	9	8
33A	28	9
34A	13	17
35A	15	11
36A	11	6
37A	12	8
38A	20	9
39A	9	9
40A	24	9
41A	30	12
42A	3	7
43A	6	5
44A	17	4
45A	7	7

Taken from Table E-1 (Holtzman, 1961)

APPENDIX III

CRITERIA FOR BARRIER SCORING

Score the following as Barrier:

1. All reference to clothing, whether mentioned as separate articles (e.g., dress, girdle, sweater); whether described as worn by a person (e.g., He has a tie on); or whether indirectly referred to (e.g., There are pleats; It has a pocket).

This category embraces all forms of jewelry and body adornment (e.g., earrings, bracelet, comb in her hair, ring, wig, false eyelashes). It does not include special hairdos, beards, or long hair.

It pertains to all forms of body protection and camouflage, e.g., gas mask, armor, helmet, umbrella, shield, mask, halo, catcher's mask, disguise, false nose, cast, arm sling, bandage, sheet (wrapped around), veil.

It includes all mechanical attachments to the body (e.g., glasses, hearing aid, wax wings, scuba tank, flippers, skates, skis, badge).

2. All references to buildings and similar enclosing structures. Examples:

arch	closet	merry-go-round	store
barracks	cottage	mine	subway
basement	fence (also hedges)	mineshaft	tent
bomb shelter	hall	monument	tower
bridge	house	porch	tunnel
catwalk	hut	shelter	warehouse
church	kitchen	skyscraper	

It embraces images which indirectly connote the existence of such structures (e.g., city, metropolis, village, town, colony, airport).

Also, it includes parts of buildings and structures (e.g., chimney, roof, stairway, walls, ceiling) and adornments within or upon them (e.g., gargoyles, door knockers, wallpaper).

Further, it involves structures which delimit or organize an area (e.g., road, sidewalk, street, curb, alley, playground, backyard, football field).

3. All references to vehicles with some containing or "holding" qualities. Examples:

airplane	boat	motorcycle	ski lift	wagon
automobile	elevator	rocket ship	sled	
bicycle	magic carpet	scooter	train	

4. All references to that which contains, covers, or conceals. This may be subdivided into the following categories:

A. Container (or container-like shapes)

Examples:	ant hill	box	freezer	pouch
	bag	bubble	glass	radio
	bagpipes	cage	globe	sheath
	ball	candleholder	hammock	spoon
	balloon	chair	lamp	stove
	bed	couch	nest	tank
	bee hive	cup	net	throne
	bell	dish	oil well	toaster
	billfold	drawer	pillow	trap
	book	envelope	pipe	TV set
	book ends	flask	pocketbook	vat
	bottle	folder	pot	well

Includes living things with special container qualities (e.g., pregnant woman, kangaroo, camel).

B. Coverings

Examples:	bear rug	mountain with snow on it
	blanket	moss on a log
	rug	bowl overgrown by a plant
	table cloth	donkey with load covering his back

C. Concealment

(Includes references to hiding or being in a concealed position. Also includes references to objects with concealing functions.)

Examples:	behind a rock	peeking out	shutters
	behind a tree	screen	smoke screen
	curtains	shades	

5. All living things (except human) described as having special surface qualities (e.g., fuzzy, rough, hard, smooth, striped, spotted, bristly, feathered, long-haired). Does not include reference to the surface being light, dark, or possessed of specific hues (e.g., red, yellow).

This category also embraces a series of animals, listed below, considered to possess distinctive or unusual skins.

alligator	goat	mountain goat	Siamese cat
badger	hippo	peacock	skunk
beaver	hyena	penguin	tiger
bobcat	leopard	porcupine	walrus
buffalo	lion	prairie dog	weasel
chameleon	lizard	rhinosceros	wildcat
coyote	lynx	sea lion	wolverine
crocodile	minx	seal	zebra
fox	mole	sheep or lamb	

[These animals are scored Barrier only if more than the head is seen.]

6. All creatures possessed of shells or similar protective structures, e.g., snail, lobster, shrimp, clam, oyster, mussel, bug with shell, crab, cactus, scorpion, turtle.

7. All references to geographic or natural formations with delimiting or container-like qualities. Examples:

abyss	harbor	river
banks of river	island	spring
canal	lake	valley
cave	pathway in woods	volcano
	ravine	

When scoring a record, give a credit of 1 to each response which contains any of the above images. But no more than 1 credit can be assigned to any given response, no matter how many Barrier images it contains.

CRITERIA FOR PENETRATION SCORING

Score the following for Penetration:

1. All references to the fact of disruption, penetration, damage, or destruction of any object or living thing. Examples:

amputated arm	man being shot
autopsy	man sick
body cut open	man wasted away
bombed building	operating on patient
bullet entering flesh	saw cutting wood
cancer	scar

deteriorated old house	squashed bug
diseased flesh	stabbing a person
diseased flower	tooth pulled
dog run over	torn muscle
hurt	ulcer
house burning	wilted flower
killed	worn out shirt
killing woman	wound bleeding
	wounded

[Includes instances of body distortion exemplified by responses like cripple, hunchback, paralyzed, cross-eyed, midget, blind, deaf.]

2. All references to body openings or to acts involving body openings. Examples:

anus	defecating	spitting
being born	drink	stick tongue out
bite	eat	vagina
chew	looking down someone's throat	vomiting
chicken pecking	mouth (separately)	yawn
	nostril (separately)	

[Do not score references to singing or talking or making sounds.]

3. All references to perceptions which involve a perspective of bypassing or evading the usual boundaries of the body or other objects. Examples:

can see through it	inside of body*
cross section of an organ	transparant gown
fluoroscope of chest	X-ray

[*Does not include references to the inside of objects which can ordinarily be entered without disrupting the boundaries, e.g., inside of house, inside of flower.]

4. All references to the process of entering or leaving structures and also the means for doing so. Examples:

came out the window	exit
climbed out the chimney	jet exhaust
door	rocket exhaust
doorway	smoke coming out of a pipe
entrance	walked through the doow
	window

5. All references to natural contexts that involve intake or expulsion. Examples:

geyser
oil spurting out of ground
volcano erupting

6. All images that are insubstantial or vague in their definition. Examples:

ghost shadow spirit

Each response that contains one or more Penetration images is given a value of 1. No more than a credit of 1 can be assigned by any response, no matter how many Penetration images it contains.

APPENDIX IV

Dear Parent,

I have been given permission by the Superintendent's Office to do research for my doctoral dissertation in psychology in the Watertown Public Schools. The study is on intuitive thinking in children and how this ability relates to age and personality. I hope you will allow your child to participate.

Each child in the study will be seen one at a time, individually, for about a half-hour. During that session, he or she will be give a task designed to measure intuitive thinking. A personality measure will also be given. Both are presented as guessing games. As well as providing important information about how children think, this should be a learning experience for the children who participate.

All results will be kept confidential and only the researcher will see them. Any material scored by others will have a code number and not the child's name. If you have any questions or want more information, please call me at 323-3098.

After all the material is analyzed (probably some time in the Spring) I will let you know the results of the research.

I hope you will permit your child to take part. Please return the bottom section of this slip.

Thank you,

Susan Shargal

Please circle "give" if your child has permission to be involved.

I give do not give permission for my child to become a participant in the study described above.

Name of child _____ Date of birth_____

Parent's signature _____ Date _____

APPENDIX V

Scales of Affect

Mood:	Good	1	2	3	4	5	6	Bad
State:	Rested/ Healthy	1	2	3	4	5	6	Tired/ Sick
Interest:	Involved	1	2	3	4	5	6	Bored
Rapport:	Good	1	2	3	4	5	6	Poor
Child's Reaction:	Liked	1	2	3	4	5	6	Disliked

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