

DOCUMENT RESUME

ED 132 757

EC 092 057

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TITLE Outerdirectedness as a Function of State Anxiety and Experimentally Induced Success and Failure in the Educable Mentally Retarded.  
INSTITUTION California Univ., Riverside.  
SPONS AGENCY Office of Education (DHEW), Washington, D.C.  
PUB DATE [76 ]  
GRANT G00-75-00187  
NOTE 75p.; Best Available Copy

EDRS PRICE MF-\$0.83 HC-\$3.50 Plus Postage.  
DESCRIPTORS \*Anxiety; \*Cognitive Style; \*Educable Mentally Handicapped; Elementary Education; Exceptional Child Research; Males; Mentally Handicapped; Problem Solving; Psychological Patterns; \*Research Reviews (Publications); Task Performance  
IDENTIFIERS \*Outerdirectedness

ABSTRACT

Examined with 95 educable mentally retarded male Ss (9-10.5 years old) was the relationship between anxiety and outerdirectedness. Ss were given the Test Anxiety Scale for Children (TASC) and a measure of outerdirectedness involving a puzzle task. Zero correlation was found between anxiety and outerdirectedness; and the same results were found after a failure condition was imposed and the TASC was repeated to test for a change in anxiety level. Ss tested in a failure condition completed the puzzle task faster than controls; however, anxiety increased significantly after the failure condition was received. (The bulk of the document consists of a research review with approximately 90 references; and appended material including drawings of the puzzle tasks, a copy of the TASC, and parent consent forms.) (IM)

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OUTERDIRECTEDNESS AS A FUNCTION OF STATE ANXIETY AND EXPERIMENTALLY  
INDUCED SUCCESS AND FAILURE IN THE EDUCABLE MENTALLY RETARDED

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The research reported herein was supported by U. S. Office of Education  
Grant No. G00-75-00187.

ED132757

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## ABSTRACT

Ninety-five males from EMR classes were selected from school districts in the Southern California area. All subjects were given the Test Anxiety Scale for Children (TASC) and a measure of outerdirectedness. Contrary to the major hypothesis of the study, zero correlation was found between anxiety and outerdirectedness. However, subjects ranking in the upper and lower third of the anxiety scale distribution were randomly assigned to a success, failure or control group in order to measure the degree of outerdirectedness after interpolated success and failure treatments. The subjects were then given the TASC again to investigate the possibility of a change in anxiety.

The hypothesized effects of anxiety level and treatment conditions resulting in greater outerdirectedness did not receive support. In contradiction to previous studies, subjects in the failure condition took the least amount of time to complete the puzzles. The hypothesized effect of failure resulting in increased anxiety received support. A significant interaction between anxiety and treatment conditions was reported in that subjects with previously reported low anxiety increased significantly in anxiety after having received the failure condition. Possible problems in using the PUZZLE TASK as a measure of outerdirectedness were discussed.

## INTRODUCTION

This study was designed to investigate a problem-solving style of educable mentally retarded children in terms of the mode of outer-directedness and its relationship to state anxiety. The study was organized in two major sections. In the first, the concern was to determine the existence of a relationship between state anxiety and outerdirectedness and to describe its nature. In the second section, the focus was on the effects of interpolating a success, failure or control condition on the level of anxiety and the degree of outer-directedness exhibited by the EMR subject.

## REVIEW OF RESEARCH

### The Outerdirected Motivational Style

The view that retardates are more rigid in their thought processes than normals of the same mental age was advanced by Lewis (1936) and Kounin (1941) which is consistent with the gestalt or field theory constructs. An alternative explanation for the behavior observed was posited by Stevenson and Zigler (1957) in which the differences in performance of normal and retarded subjects reported by Lewin and Kounin were related to motivational differences between the groups rather than to differences in cognitive rigidity. The latter hypothesis was based on the assumption that institutionalized retarded children tend to be relatively deprived of adult contact and approval than do normal children. In addition, cultural familial retardates' performances were viewed as depressed by the effects of social deprivation and an expectancy for

failure according to the same dynamics discussed above. A retarded child, therefore, approaches a given task with a "negative reaction tendency" due to past failure experiences, as well as a "positive reaction tendency" or desire to interact with a reinforcing adult. Zigler (1961) stated that assuming retarded subjects have negative feelings toward an experimental situation, it may be hypothesized that such subjects begin the session with a relatively high positive tendency to respond due to a greater motivation to interact with and to gain the approval of an adult which, in turn, stems from the negative experiences, perhaps of a painful nature, which they have had at the hands of adults. If, however, the child learns during the experimental situation that the experimenter is not like other strange adults he encounters in his environment, then the subject meets the session with a positive tendency which is reduced much less than his negative tendency. The finding (Zigler, 1962) that retardates terminated an experimental game earlier than normals in compliance with the examiner's suggestion was seen to result from outerdirectedness where a child experiences failure in solving problems on his own and as a consequence becomes, wary of self-initiated actions. The child becomes, consequently, more sensitive to external cues and relies unduly upon them, in hopes that they are more reliable indicators of appropriate responses than are his own solutions. Further, the child is apparently more successful when doing so.

The findings of Green and Zigler (1962) and Zigler, Hodgden and Stevenson (1958) that retardates were more sensitive to cues given by an adult than are normal children of the same MA led Zigler and his associates to formulate a motivational style of problem-solving which they

termed "outerdirectedness" (Sanders, Zigler and Butterfield, 1968; Turnure and Zigler, 1964). This style was defined as the degree to which the subject uses external cues in his problem solving rather than relying on his own cognitive resources.

Green and Zigler (1962) employed institutionalized and noninstitutionalized retarded groups as well as normal control groups to test the hypothesis that the noninstitutionalized retardates and normals would choose to terminate a task more rapidly than would institutionalized retardates. In addition to their findings of no significant increase or decrease on Part Two as compared to Part One of the criterion task, a satiation exercise, nor any significant interaction effects, Green and Zigler found a tendency for the retarded subjects to terminate games at points where the examiner reminded them that they could stop, while normal subjects tended to terminate the monotonous game on their own initiative. Zigler, Hodgden and Stevenson (1958) interpreted the same findings as evidence of the greater compliance of retardates with instructions. The greater compliance stemmed from the greater social deprivation experienced by institutionalized retardates. Zigler, Hodgden and Stevenson (1958) defined this overt manifestation of outerdirectedness as a mechanism employed to gain desired social reinforcement. Another, more plausible, explanation is suggested by Green and Zigler (1962). They hypothesized that the child's compliance with adult suggestions or his sensitivity to the cues of adults is related to the relative amounts of success and failure that the child has experienced in dealing with problems with which he is confronted. If a child's self-initiated solutions result in a high percentage of failure experiences,

then he may be wary or come to distrust such self-initiated actions. The child would then be expected to evidence a greater sensitivity to external or environmental cues in the hope that such cues would be more reliable indicators of appropriate responses that are his internal ones. If it is assumed retardates encounter more failure experiences, for example, encounter more problems beyond their capacity to solve, then Green and Zigler's hypothesis generates the predictions that retardates would evidence a greater sensitivity to external cues than normal subjects and that non-institutionalized retardates live in a relatively protected environment, one that is adjusted to their intellectual limitations, they presumably experience less failure than expected to live up to expectations normal for a child of his chronological age. Hence, the noninstitutionalized retardate is more open to experience failure with a resultant increment in his sensitivity to and dependence upon external rather than internal cues.

One of the first tests of the outerdirected position was carried out by Turnure and Zigler (1964). They conducted two studies to test the hypothesis that the high incidence of failure experienced by retardates results in their employing an outerdirected style of problem-solving. In Study One noninstitutionalized familiar retarded and normal children matched on MA, experienced either success or failure treatments during three games and then were administered two imitation tasks. They found that retardates were more imitative than normals, and that all the children were more imitative following the failure than the success condition.

In Study Two normal and retarded subjects matched on MA and randomly divided into experimental and control groups performed two object assembly

and one block-board task. Twenty normal and twenty retardates were matched on MA and were assigned to control and experimental groups in which an equal number of boys and girls were placed in each group. The normal and noninstitutionalized retardates were instructed to assemble a simple puzzle of four pieces as fast as they could. While the subject was assembling his puzzle, the experimenter put together a second object-assembly item. They hypothesized that the outerdirectedness of the retarded child would lead him to attend to what the experimenter was doing rather than concentrate on his own task, thus interfering with his performance on the first puzzle. When the child completed his puzzle the experimenter took apart the puzzle he had assembled. He then gave the second puzzle to the child and told him to put it together as fast as he could. Turnure and Zigler found in Study Two that the retarded experimental group did poorer than the normal experimental group on the first object assembly task, a horse puzzle, but performed superior to the normals on the second object assembly task, an elephant puzzle. The retarded experimental group also showed a tendency to be more imitative on the block-board game and they made more glances toward the examiner. Significantly, Study Two demonstrated that outerdirectedness may be either detrimental or beneficial depending on the nature of the total situation. Heightened outerdirectedness therefore is not invariably detrimental to performance on problem solving tasks and may even be incorporated in learning situations as an aid.

The difference in the incidence of imitation between normals and retardates was more striking in Study Two than in Study One. Significantly, the imitation procedures of Study One and the block-board task

of Study Two differed greatly in the degree to which they would be expected to induce imitative responses. In Study One the child was told that he was to make some designs; then instructed to observe the adult experimenter make a design, and finally asked to make his own design. In Study Two the child was already drawing when the experimenter engaged in behavior which later could be imitated. Furthermore, the experimenter engaged in this behavior unobtrusively, giving no overt indication that the child would eventually be faced with the same task. This latter procedure required the child to shift his attention from his task to the experimenter's behavior in order for any imitation to take place. Turnure and Zigler stated that the observed tendency of the retardates to imitate under even these conditions indicates the pervasiveness of his reliance on external guidance.

Importantly, Turnure and Zigler cautioned that a retardate is not more outerdirected than a normal child simply because he has a lower IQ. The degree of outerdirectedness of any individual child depends rather on two factors: the level of cognition attained, or MA; and the degree of success experienced through employing whatever cognitive resources he has available.

The central question addressed in Sanders, Zigler and Butterfield's investigation (1968) was whether the outerdirectedness of retardates found on simple imitation and object assembly tasks also manifested itself in a standard discrimination learning situation. The finding that the retardates' outerdirectedness influences their performance on a simple three choice size discrimination would indicate that this style of problem-solving is not a task-specific problem-solving style but a

more pervasive phenomenon. High and low distractible retardates of mixed etiology and normals of comparable MA learned a three choice size discrimination with and without an additional cue. For half the subjects in the cue condition, the cue always indicated the correct stimulus, the positive condition; and for the other half the cue indicated an incorrect stimulus, the negative condition. The cue conditions were either the examiner's finger or a light. The primary hypothesis that retardates would manifest a more outerdirected style of learning was confirmed in the negative cue conditions only. The retardates relied upon the negative cue even though it led to errors whereas the normals did not.

Results did not support the subsidiary hypothesis that the finger cue would evoke more outerdirectedness than the light cue and that outerdirectedness would be found more commonly in the distractible than the nondistractible retardates. Sanders, Zigler and Butterfield (1968) concluded that the failure to find differences associated with the type of cue might have been due to the extreme potency of both cues "which would mask any differential effectiveness." Perhaps also the disembodied finger was not sufficiently human to be perceived as such. Since only one cue was presented to each subject, the authors posit that presenting the two types of cues simultaneously would enable the subject to demonstrate a preference between them.

The failure to find differences between high and low distractible retardates, Sanders, Zigler and Butterfield (1968) viewed as indicating that distractibility is not related to outerdirectedness. However, the procedures employed in the study may not provide a sensitive test of the distractibility hypothesis. The validity of the distractibility ratings

employed is questionable. Attendants were employed to rate the cottages and it was noted that analysis of the distributions of ratings from different cottages indicated that attendants in each cottage used their own group of children, rather than children in general, as their reference group, thereby introducing selection biases into the sample. Children are often assigned to cottages according to specific characteristics, as IQ, which could be related to distractibility thus rendering the ratings employed by Sanders, Zigler and Butterfield (1968) imprecise and questionable.

Finally, the finding of greater outerdirectedness among nonfamilials may be consistent with the outerdirectedness position and emphasizes the importance of attending more to the discrepancy between societal demands and intellectual capacity alone when looking at the behavior or retardates.

Drawing from Sanders, Zigler and Butterfield's (1968) finding that children responded equally to the light and finger cue, Achenbach and Zigler (1968) proposed a distinction between the two degrees of reliance upon situational cues in problem-solving. The distinction was formulated in terms of two contrasting learning strategies: 1) a cue-learning strategy involving heavy reliance upon situational cues and 2) the problem-learning strategy involving "active attempts to educe abstract relationships among problem element." Using both an institutionalized and noninstitutionalized retarded and normal sample, Achenbach and Zigler (1968) demonstrated in experiment one that retardates could learn a three choice relative-size discrimination as quickly as normals of the same MA. Results indicated that retardates relied more on the more

obvious, but somewhat misleading, cues than did normals. Noninstitutionalized retardates relied on the cue significantly longer than institutionalized retardates which supported Green and Zigler's (1962) position regarding the hypothesized history of extensive failure experienced by non-institutionalized retardates.

The second experiment demonstrated that reliance on the cue by retardates involves an inhibition of learning rather than caution in responding. They had subjects do the sticker imitation task, but allowed for a more differentiated scoring that was employed by Turnure and Zigler. An overall comparison showed that the imitation scores for retardates were not significantly greater than those for the normals. However, when imitation was rescored by the Turnure-Zigler method the difference became significant. This suggests that retardates imitate in a "gross all-or-none" manner more than do normals, who tend to be influenced more subtly by the adult model. Further analysis of the data revealed that one special class of sixteen retardates performed better than normals. Although the results were not significant, Achenbach and Zigler (1968) stated that the particular teacher's methods demonstrate that "persistent success experiences and reinforcement for independent thought could lead retardates to give up reliance on the cue as quickly as normals of the same MA." The teacher's reported methods focused on long-term manipulation of the same variables considered important in the study. The failure of the success/failure manipulations in experiment two to produce a significant effect of cue learning could be attributable either to the fact that the learning strategies were so set as to remain virtually unaffected by the short term experiences, or that the manipulations were too weak to

produce the hypothesized effect.

Finally, in a third experiment, Achenbach and Zigler (1968) found a significant correlation between imitativeness and cue learning in retardates but not in normals. The lack of a significant correlation might indicate that the construct, outerdirectedness, is not as valid for normals such as those included in the study.

Turnure (1970 and 1971) found that the non-orienting behavior evidenced in retardates reflected an information seeking strategy rather than a short attention span or distractibility. In Study I Turnure (1971) compared the glancing behavior of young and old retardates with normal children, some whom had similar MA's, others who were rough MA matches for the young retardates. The retardates were mainly familial, but each group had one emotionally discurbed child and one Down's Syndrome child. These subjects' behavior were reported indistinguishable from the others in the test situation. The apparatus was a light-proof booth which housed the response recording equipment, the projector used to present the learning problem stimuli and the observers who would closely observe the subjects through a one-way mirror. In the control condition, the mirror was covered with a white screen which eliminated reflection but still allowed observation. The task presented was an oddity problem in which the subjects picked the odd object in order to be reinforced by a red reward light. Unlike Zigler and Turnure (1964) a glance was recorded each time the subject's eyes left the stimulus panel. Turnure's comparison groups found retardates less inattentive and distractible than previous research has suggested (Cruse, 1961). However, Turnure noted that before concluding that the retarded are not distractible, further con-

sideration would be given to the task difficulty and the specific situation in which the task is administered. The total time glancing scores showed that younger subjects spent more time in nontask orientation than did older subjects; and that the normal subjects spent more time glancing in the mirror condition while the retardate glanced longer in the control condition. Significantly, Turnure did obtain reliability ratings of observations by using a second observer intermittently throughout the study. Correlations of .94 and .92 were obtained for inter-rater agreement on the number of glances observed and the time of the glances, respectively. An analysis of the number of glances of the eight MA comparison groups over the five minutes showed that younger subjects glanced significantly more often than older subjects; and that the mirror condition subjects glanced significantly more often than controls; and interestingly, the normal subjects glanced more than the retardates, although none of the interactions approached statistical significance. The total time glancing scores showed that younger subjects spent more time in non-task orientation than did older subjects; and that the normal subjects spent more time glancing in the mirror condition; while the retardates glanced longer in the control condition. In general, most of the subjects, even if young or mentally retarded, were non-task oriented for only a small percentage of the total time. The group with the highest glancing scores was the four and one-half year old normals-mirror group, where the subjects spent almost one minute out of five glancing. Turnure (1971) found that, in situations where normal and retardates of the same CA are given an age-appropriate task or assignment to perform, the normal children apparently could orient themselves to the task, with only occa-

sional brief glances away, until it was solved or completed. The retardates, however, would not direct themselves toward the task to the same degree, thereby evidencing more prolonged non-task orientation. Turnure (1970) states, "the assignment of a task that is appropriate for the normal child and so is inappropriate for the same CA retarded child brings into question the logic of concluding that the retarded child is attentively deficient, unless it can be demonstrated that the normal child will attend as diligently to a task which is an inappropriate for his MA as the original task was for the retarded," (Turnure, 1970).

In Turnure's (1970) study, however, the above findings appear to be biased against the normals through inclusion of post-criterion glances. Glancing up and around the room seems a natural behavior after one has completed a task. However, Turnure noted that an analysis of pre-criterion time glancing scores resulted in retardates glancing scores being three times that of the normal subjects in both the mirror and the screened mirror condition.

The results of this study and others (Ellis, Hawkins and Pryer, 1963; Baumeister and Ellis, 1963; and Sen and Clarke, 1968) did not support the distractible description of retarded children. However, it should be noted that this study was concerned with overt, observable, orienting responses, only one aspect of attending, and should not therefore be generalized to include all aspects of attending such as those discussed by House and Zeaman (1963). Further, in discussing the nature of distractors, Turnure (1970a) noted that stimuli, whether social or physical, cannot be considered homogeneous in their salience or potency as distractors. The age of the child and nature of the distractors are merely two conditions limiting generalization.

In Study II Turnure (1970b) investigated the extent to which non-orientation toward a task is influenced by the presence of an adult examiner. Also, two conditions were employed to determine if glancing toward the experimenter was simply for purposes of social interaction or other task irrelevant purposes, or whether these glances represented information seeking behavior. A relevant-cue condition was presented in which the experimenter engaged in behaviors which would help the subject on the task, while similar behaviors in a irrelevant-cue condition would not be helpful to the subject. The finding that the subjects showed marked increases in glancing over Study I is confounded by sampling biases in that subjects from Study I were used as subjects. Therefore, the generalization that the adult experimenter was a highly attractive stimuli is questionable since it is possible that the greater glancing behavior evidenced was influenced by prior experience in Study I.

Turnure and Zigler (1964) devised a third study using naive subjects and again found greater glancing behavior and superior learning under the relevant cue condition as compared to the irrelevant cue condition. However, the final sample was very small thus making statistical comparisons and general conclusions limited due to unknown sampling errors. Turnure and Zigler concluded that comparison of results in Studies I and II indicated that the greater glancing of the repeated subjects in Study II was due to the failure they experienced in Study I, since failure has been shown to induce greater outerdirectedness in the retarded.

Turnure and Larsen (1971) did a study which considered these possible confounding variables. They further criticized the third study with the naive subjects for its small sample and for the non-inclusion of a con-

trast condition in which subjects would perform without an experimenter present. Since such a control was not employed it is impossible to make direct comparisons of subjects' behavior with and without an adult present. Turnure and Larsen's study sought to clarify the relationship between learning and glancing and the presence or absence of the experimenter and in addition, to the differential effects of having the experimenter giving or not giving cues. Finally, possible sex differences in learning or glancing under the experimental conditions was investigated for the first time. The three experimental conditions were: 1) experimenter not present, 2) experimenter present and providing relevant cues and 3) experimenter present and providing irrelevant cues. The results were consistent with previous findings (Turnure, 1971), and by the inclusion of a contrast control condition, substantiated the data and conclusions of previous research. Sex differences were found which indicated that mentally retarded girls might not be as outerdirected as mentally retarded boys. Learning data revealed significant treatment effects only for boys. However, Turnure and Larsen (1971) suggested that the results for the girls may be situation specific in some way. They cited subjective impressions of the adult examiner which indicated certain differences in the general behavior of the male and female subjects. The examiner noted that male subjects showed "extreme and active interest in the experimenter (an adult male) while girls were more sedate and withdrawn." The effects of this difference in pre-experimental interaction behaviors might have carried over into the experimental situation. Turnure and Larsen interpreted this condition in terms of social deprivation theory since all teachers of the subjects were women. They cited

a need for a sex of subject x sex of examiner x sex of teacher study to further clarify this relationship.

Performance was better in the relevant cue condition than in the irrelevant cue condition for both sexes. The finding that subjects in the irrelevant cue condition performed no poorer than subjects in the experimenter not present condition suggests that the retarded children in the study were not grossly distractible.

Results of the glancing data confirmed the hypothesis that subjects would show greater non-task orienting in the experimenter present condition than in the experimenter not present condition. This non-task behavior is evidence of an information seeking strategy rather than any heightened distractibility. Results of the reversal trials also confirmed these findings and further revealed a significant positive correlation in the relevant cue condition and a significant negative correlation in the irrelevant cue condition thereby substantiating the outerdirected hypothesis, by providing data on the relationship of glancing and learning.

Yando and Zigler (1971) found several inconsistencies with regard to the genesis of the outerdirected style of problem-solving. They found in two studies (Achenbach and Zigler, 1968; Turnure and Zigler, 1964) differences were reported in outerdirectedness between two groups of normal and familial retardates, yet in Sanders, Zigler and Butterfield's (1968) study differences were found between groups of normals and organic retardates but not between groups of normals and familial retardates. Sanders, Zigler and Butterfield (1968) concluded that "parental expectancies result in phenomenologically more failure in the

organic than in the familial retarded and, therefore, lead to greater outerdirectedness in the organic group." Turnure and Zigler (1964) and Green and Zigler (1962) suggested that an outerdirected style of learning is not simply a direct product of low intelligence, but it arises because of an inability, due to low IQ, to meet the demands of parents and society. They stated that it is well documented that non-familial retardates come from typically more middle class backgrounds than do familials, who generally come from more deprived and lower class homes. They posited that there is a greater discrepancy between the non-familial's parents' expectations and his ability to meet their expectations than for the familials. The greater outerdirectedness evidenced among non-familials "suggest the importance of attending more to the discrepancy between social demands and intellectual capacity than intellectual capacity alone," (Turnure and Zigler, 1964). Yando and Zigler (1971) criticized the Sanders, Zigler and Butterfield (1968) study for failing to employ etiology as a dimension in their design. Their groups of organic and familial retardates were not equated on MA or IQ. Consequently, Sanders, Zigler, and Butterfield's (1968) finding might be the result of comparing lower IQ and lower MA organic children and higher IQ and higher MA familial children with a group of normal children whose MA falls between the two groups of retardates.

Another point Yando and Zigler (1971) sought to clarify in their study concerned the salience of different classes of external cues. Turnure and Zigler's (1964) study concluded that young children first employ cues provided by adults and peers, and that children who continue to rely heavily on external cues, those who have met success in employing this strategy, eventually generalize to a wide variety of cues in problem-solving situa-

tions. Citing Sanders, Zigler and Butterfield's (1968) finding of no differential sensitivity between human and nonhuman cues among outerdirected subjects, and Achenbach and Zigler's (1968) failure to verify that there is less dependence on external cues at higher than at lower cognitive levels, Yando and Zigler (1971) focused their study on whether human cues possess greater salience than nonhuman cues.

Eight groups of twenty-four children, institutionalized and non-institutionalized familial and organic retardates and younger normal children were given a three choice discrimination learning task in which a light cued one of two incorrect stimuli and a sticker imitation task used by Turnure and Zigler (1964) in which the subject could imitate designs made by an adult or presented by a machine. Results indicated that all four retarded groups compared to the four normal groups were more outerdirected as measured by selection of more erroneously cued stimuli and imitating more often on the sticker game. Furthermore, retarded subjects were found to select persistently the incorrect cued stimulus even though their responses were not reinforced. This indicated that outerdirectedness reflects a learning strategy versus an inherent inability to learn, since retardates learned as well as non-retardates in the control condition where no cue was presented.

Support for the general developmental aspect of the outerdirected construct was found in the imitation data. Younger normal children imitated significantly more than older normal children. An interesting finding was that with the exception of the CA normals, the subjects exhibited more nonhuman than human imitation. It may be that this was not a valid test of the human-nonhuman cue hypothesis since Yando and

Zigler (1971) found that more institutionalized nonretardates than noninstitutionalized nonretardates made more noncued than cued errors. Retarded subjects did not evidence this. The finding that the institutionalized younger nonretardates imitated less than the noninstitutionalized nonretardates may be related to Zigler's discussion of the negative reaction tendency (Zigler, 1961). He concluded that the early negative life experiences of the nonretarded institutionalized children resulted in a wariness in reacting to erroneous cues given by adults. Yando and Zigler (1971) concluded that the failure to find this attenuated imitation in the institutionalized as compared to the noninstitutionalized older nonretarded subjects may be due to overall general tendency not to imitate found in the older children.

Like Sanders, Zigler and Butterfield (1968), Yando and Zigler (1971) found the performance of noninstitutionalized organics was more outerdirected than that of institutionalized familials was less outerdirected than institutionalized familials. It appears that the noninstitutionalized organically retarded child faces greater societal and parental demands, and consequently encounters more failure which results in a more outerdirectedness than his counterpart in an institutionalized setting which is adjusted to his lowered intellectual development.

The performance of the institutionalized and noninstitutionalized organics supported Turnure and Zigler's (1964) finding that the observed distractibility in retardates reflected a problem-solving strategy rather than an inherent cognitive characteristic.

Yando and Zigler's data (1971) failed to confirm Achenbach and Zigler's finding (1968) that noninstitutionalized familials were more

outerdirected than institutionalized familials. Importantly, differences in the Yando and Zigler study approached significance. Caution is indicated, however, in generalizing from these findings and in comparing these two studies since particular institutional settings vary and are not comparable. Also, neither article described in detail the nature of the particular institutions in which the subjects resided so that generalizations of findings can be made to subjects in similar environments. Another point of variability in the two studies concerns the age of the subjects. The institutionalized familials in the Achenbach and Zigler (1968) study were older than the noninstitutionalized familials and both the institutionalized and noninstitutionalized familial groups in this study were older than the familials used by Yando and Zigler. A developmental phenomena might therefore, explain the differences in findings. Also, there are procedural differences in the two studies. Yando and Zigler (1971) necessarily paired responding to the cue with an incorrect response while Achenbach and Zigler (1968) reinforced responding to the cue with a correct response. Comparisons between the two studies is difficult since their findings may be due to procedural differences.

### Anxiety

The investigation of state-anxiety as a transitory emotional state that can vary in intensity and fluctuates over time is based on Freud's original conception and formalization of it (1936) and as a part of psychoanalytic theory. He described the three criteria of an anxious reaction as being 1) it is unpleasant, 2) there are physiological concomitants and 3) there is an awareness that anxiety is a conscious experience including dread, fear, worry and their physiological concomi-

tants (Sarason, Davidson, Lighthall & Waite, 1958). The presence of the reaction is conceived to be a conscious danger signal associated, not only with external danger but also with unconscious contents and motives developed from the relationships between present and past experiences of the individual. The development of anxiety takes place in the family setting from the earliest years of life according to psychoanalytic theory (Gaudry & Spielberger, 1972). Gaudry and Spielberger describe the emergence of anxiety as being a result of constant evaluation of the child by parents in a wide variety of settings. Adverse evaluation by parents who were depended upon by the child for approval, direction and support, would create hostility which could not be expressed. Investigation into present situations may reveal a connection between a present danger and unconscious processes from previously unresolved conflicts.

The focus on the evaluative nature of the original antecedent of state-anxiety restricts the situation in which it will occur. Phillips describes state-anxiety as being focused on a specific class of situations, for example, test or test-like situations in school. Such a situation became the direction of study of Sarason (1958) and the Text Anxiety Scale for Children was developed as a result. Sarason (1958) concluded that fear of school failure was one of the most common worries or fears among children and that the discernment of this anxiety would have very practical and clinical value in school. Since failure or success is usually the result of having been tested or evaluated in some manner, Sarason focused his investigation on this situation. In addition, Sarason describes the test situation as frequently working the anxious response at a strength which would allow evaluations of theoretical con-

ceptions about significances of anxiety in the organization and development of personality. He concludes his justification for the study of test anxiety by saying that if test anxiety is an important and frequent response to the test situation, then there is a need for a methodology for its assessment which would have relevance for the general problem of the nature and effects of test-taking attitudes and reactions.

According to psychoanalytic theory (Sarason, 1960), anxiety evolves from a reaction that occurs automatically to a dangerous or painful situation which is already present to a reaction which occurs before the beginning of the painful stimulation. It becomes a signaling device which warns the organism and enables it to take preventive measures to avoid the experience of pain. The organism learns to react to the danger signals which are both constitutionally and environmentally determined, in ways that may be flexible or rigid. Sarason describes these early-learned reactions as being the basic determinants of personality and character in later life. If the defense processes are flexible, they will probably be adaptive in most situations. If, however, they are rigid, they may be maladaptive and may interfere with adaptive functioning (Sarason, 1960). Phillips (1966) also describes two basic styles of coping with anxiety-producing situations. The approach oriented response is more reactive to the initial experiences of a threatening situation and shows greater adaptation to subsequent experiences in the threatening situation than the avoidance oriented response. Ruebush (1963) describes another response to anxiety as defensiveness. Defensiveness is a result of unconscious anxiety which enables the highly defensive person to experience anxiety only occasionally, and then only when he is in an especially threatening

threatening situation and his defenses are inadequate or break down and expose him to conflicts.

Phillips (1966) applies the psychoanalytic explanation for the development of anxiety to the school setting. He describes the child who experiences anxiety in school situations in which he is evaluated by teacher, peers and parents (either explicitly, as in test situations, or implicitly, as in peer relations), as reacting with hostility to the evaluator who he believes will judge him. As described before, the hostility clashes with the depending needs and is thus not openly expressed but is, instead, turned inward against the self in the form of self-derogatory attitude, although it may be directed toward others. This strengthens the expectations of failure and his desire to escape such school situations. The basis for the hostility, therefore, is the comparison of the failure to meet parental expectations to the school setting where the teacher fulfills essentially the same role as a parent. Sarason (1960) concurs with this explanation by saying that once the anxious reaction becomes a distinctive aspect of the child's personality it can be transferred from the interpersonal situation in which it was reinforced to other situations and relationships. This discounts the hypothesis that test anxiety would be found in many children from backgrounds where intellectual and academic achievement is not stressed but who are placed in situations where these values are important.

Gaudry and Spielberger (1971) describe quite thoroughly basic personality correlates of anxiety or coping or defensive styles of handling anxiety. They describe anxious children as developing self-derogatory attitudes which lead to over-concern with bodily adequacy. They summarize

Sarason et al.'s findings about high-anxious children by saying that they tend to blame themselves for their failures, to be dependent on others and to have difficulty expressing hostility in an appropriate manner. Hill and Sarason (1966) confirmed earlier findings by Lighthall (1961, 1963) that a child with high anxiety admitted to universal worry as well as to hostility, feelings of inadequacy and negative effect in general. Studies investigating ways to express anger and hostility (Penney, 1965) concluded that anxious children are less prone to explore unknown and unfamiliar situations. Penney extrapolates further and suggests that this child would prefer a stable, well-defined school routine, not one with a great deal of change or where children are given a great deal of freedom. Behaviors exhibited by subjects have been identified by objective trained observers as being typical of anxiety reactions. Sarason et al. (1958) observed high and low anxious children for one hour and concluded that high anxious children, especially the boys, were less secure, less task-oriented and less academically oriented than the low anxiety subjects. A follow-up study of Davidson and Sarason (1961) reaffirmed the previous findings and included such behaviors as hiding emotions, difficulty in communications, submissiveness, caution, lack of ambition, underactivity, underachievement, lack of attention and lack of responsibility.

The affects of anxiety upon performance and relationship of task complexity, instructions, and worth have been of great interest to investigators of test anxiety. Paul & Eriksen (1964) investigated the effects of telling the subjects the purpose and value of the test they were taking. They concluded that high-anxious students did better on examinations given under the non-stressful condition and the low-anxious

students did better under the more stressful condition. Gaudry and Bradshaw (1970) also found significant interaction between anxiety and examination procedures supporting a tentative conclusion that reducing the testlike characteristics of examination situations will facilitate the performance of high-anxious students.

Lunneborg (1964) investigated the possibility of a correlation between various measures of classroom performance and anxiety level. Using the results of their anxiety scales, the TASC, the Children's Manifest Anxiety Scale and the General Anxiety Scale for Children and reading and arithmetic achievement scores, he obtained significant negative correlations of  $-.18$  and  $-.32$ . Sarason et al. (1960) substantiated these findings that correlations between anxiety level and achievement are negative and tend to become higher with each grade. Frost (1968) also concurs with a study correlating scores from a "School Anxiety" scale and a "General Anxiety" scale with four performance measures: Vocabulary, Reading Comprehension, Mechanical Arithmetic, and Problem Arithmetic.

Of additional interest is whether the effects of anxiety have long term consequences reflected in school performance. Hill and Sarason (1966) found a clear relationship between change in anxiety level and several measures of achievement during the elementary school years. Most significant was the increase in performance of those children who dropped from high levels of anxiety to a lower level over those who increased in anxiety level from low to high. In addition, Keys & Whiteside (1930) revealed the finding that those children characterized as anxious tended to average more than one year retarded in age-grade standing, and nearly two years lower in mental and educational age. Sarason (1960), however, cau-

tions against generalization of these previous results because of the complexity of the relation between test anxiety and achievement and that there is a greater need to consider the possibility that test anxiety will have different effects in different kinds of situations.

Sarason (1960) has two hypotheses about the relation between test anxiety and intellectual performance. First, he conjectures that when the test anxious child has to function independently in a problem-solving situation his performance will be affected adversely. His second hypothesis is that when the problem-solving situation is structured to allow the strong dependency needs of the test anxious subject to be satisfied, his performance will not show the adverse effects of anxiety. He describes the basis for these hypotheses as the assumption that the reaction of anxiety in a problem-solving situation prevents awareness and responsiveness to the external task. However, according to Sarason, there are no data to evaluate and test these hypotheses. The majority of studies that investigate this relationship, however, have shown that anxiety can interfere with intelligence. Studies by Granich (1955) and Kent and Davis (1957) show evidence of the specific nature of the interference in that they show that anxiety is particularly interfering in tasks such as block design, reproduction of designs from memory, and the Performance subtests of the Wechsler Intelligence Scale for Children. Lightfoot (1951) also reported that test anxiety can impair intelligence test performance but of boys, not girls. Montag et al. (1955) concurs but also provides evidence of the fact that anxiety has long-range effects and that certain systematic and dynamic personality factors underlie the development of the anxiety.

Further investigation into the relationship between anxiety and intelli-

gence has encouraged studies of anxiety and mentally retarded subjects. Tymchuch (1972) suggested that anxiety, as a situational tendency manifested when the child feels threatened, is a prevalent personality characteristic of the EMR child from an impoverished background. As a result of limited language models (Deutsch, 1965) and lowered levels of parental motivation and expectations for success (Rosen, 1956, 1959), this child may not be adequately prepared to compete with his middle-class peers especially in testing or evaluative situations which are too incongruous to his previous experiences. As a result, the child experiences a high degree of anxiety. Studies by Cochran & Cleland (1963), Feldhusen & Klaumeier (1962), Mandler & Sarason (1952), and Reger (1964) support this conclusion with their evidence that low SES groups score significantly higher on manifest anxiety and avoidance scales than do the high SES group and that this anxiety results in poor test and scholastic performance. The findings of McCandless and Castenada (1956) and Hafner & Kaplan (1959), also suggest that anxiety is debilitating among populations that include subjects who are likely to be threatened by intelligence tests as a result of a lack of familiarization with the testing situation.

The Test Anxiety Scale for Children consists of items concerned with attitudes toward and experiences in test and test-like situations. Sarason et al. (1958) report a test-re-test reliability at 2 months at .71 and split-half reliability at .79 and .886. The scores increase significantly with grade but the increase is not regular or steady. Silverstein et al. report the use of the TASC with the mentally retarded with scores being negatively related to intellectual performance. Retarded children score higher than normal children but institutionalized and non-institutionalized

did not differ on the TASC. Silverstein identified four factors in the TASC: Test anxiety, general school anxiety, recitation anxiety and physiological arousal. For retardates, the factor structure is more complex with the order being general school anxiety, recitatorial anxiety, test anxiety and one unidentified factor.

#### RATIONALE

Substantial evidence may be interpreted to suggest that educable mentally retarded children who encounter excessive failure have a problem-solving style characterized by a reliance on concrete situational cues. The substitution of environmental cues for the individual's own cognitive resources has been referred to as outerdirectedness (Turnure & Zigler, 1964). The degree of outerdirectedness is thought to depend on two factors: the level of cognition attained by the child, or mental age (MA) and the degree of success experienced through employing whatever cognitive resources a child has available (Turnure & Zigler, 1964). With the increase of greater cognitive resources and increased successful experiences, the child should become more inner directed since such cognitive development and motivating experiences frees the child from his dependence on external cues. However, the current evidence on the role of the MA (Achenbach & Zigler, 1968; Massari & Mansfield, 1973) is inconclusive but the role of failure has been well documented (Green & Zigler, 1962; Turnure, 1970(a); 1970(b); 1970(c)).

The role of failure as manifested by outerdirectedness and its relationship to the level of anxiety experienced by the educable mentally retarded child provides the central question to be investigated in the present study. In comparison with normals of middle socio-economic status,

the EMR child, particularly of low socio-economic status, experiences more anxiety during threatening situations (Tymchuch, 1972). Silverstein (1964) also reports that anxiety has a negative relationship with intelligence and, in particular, that retarded children score higher on anxiety measures than normal children. The nature of the retarded child's anxiety and how it interferes with academic performance remains unclear, however. An important component of the retarded child's history of failure may be his anxiety level. As a means of investigating this question, this study focused on whether increased anxiety increases the child's tendency to attend to environmental cues rather than to the task and, therefore, encourages the child to become outerdirected in his style of problem-solving.

#### METHOD

##### Subjects

Ninety-five male subjects from intermediate classes for the Educable Mentally Retarded were selected from seven public school districts in the Southern California area. The children ranged in age from nine years zero months to ten years six months and were from school districts serving primarily lower-middle class families. No children were used who displayed any gross motor, perceptual, or sensory impairments. All children had been enrolled in a special class for EMR children for at least one academic year prior to the beginning of testing. Since a variety of intelligence tests had been used by the various school districts to determine each subject's IQ, enrollment in the special class for one year was decided upon as testing criteria for inclusion in the study. All

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Insert Table 1 about here

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subjects were administered the Test Anxiety Scale for Children. The number of questions answered yes were totaled for each subject. All subjects were then given the PUZZLE TASK after Turnure & Zigler (1964) as a measure of outerdirectedness. Those subjects in the upper one-third of the anxiety scale rankings and those in the lower one-third were randomly assigned to success, failure and control groups in order to measure the degree of outerdirectedness exhibited after interpolated success and failure treatments. The TASC was then re-administered to all subjects. A 2 x 3 factorial experiment with six subjects in each cell yielded 36 subjects for the measures of outerdirectedness.

#### Procedures

All subjects were taken individually to a room containing a table and three chairs. Two experimenters were used who were unaware of the hypotheses being tested. The TASC was read to the subject and he was asked to answer yes or no. The experimenter recorded the answers. The number answered yes was totaled for each subject. The subjects were then given the PUZZLE TASK. It consisted of two puzzles (adapted from the horse and elephant from the WISC Object Assembly test). The experimenter explained, "Here are some pieces of a puzzle. When you put them together they will make something you know. I want you to put them together as quickly as you can. While you are putting your together, I will put one together too. Any questions? Okay, here's your puzzle. Begin." As soon as the subject began working the other experimenter

started the stop watch. While the subject assembled the first puzzle the experimenter assembled the other puzzle. The experimenter left the completed puzzle in view for ten seconds, then disassembled it and left it in view for thirty seconds. If the subject had not completed the first puzzle, the experimenter repeated the cycle with the puzzle. Upon completion of his puzzle or the end of three minutes, the experimenter covered his puzzle and recorded the subject's score.

The subject was then given the first experimenter's puzzle to assemble and was told, "Here is another puzzle to put together as quickly as you can. Do it as fast as you can. Any questions?" During both sessions with the puzzles, an experimenter recorded the time of completion and glances of the subject. Glancing scores were recorded by tabulating the frequency of glances at the experimenter or experimenter's puzzle.

Two weeks later, the second part of the study was conducted. Those subjects in the upper and lower one-third of the anxiety scale were given the interpolated success and failure treatment.

Interpolated Success. Three pictures (a duck, a sailboat, and an airplane) were divided into three pieces which were found to be easily recognized and easily assembled for children of this age. Under the success condition, the experimenter allowed the subject to complete the assembly of the puzzle and then clicked the stop watch. The experimenter removed the puzzle and said, "That was very good. You're good at putting puzzles together." The second puzzle was then given to the subject and he was allowed to finish it, whereupon the examiner said, "You did very well on this puzzle also, could you put another one together for me?" When the third puzzle was finished, the child was told, "You put this

puzzle together better than anyone I have asked. You're very good at this."

Interpolated Failure. Those subjects selected to receive the failure treatment were not allowed to complete any of the three puzzles. Puzzles with this group were divided into 20 pieces, thus providing greater feelings of failure since it was impossible for them to be assembled in one minute by children of this age. After the subject was stopped on the first puzzle the examiner said, "You did not finish the puzzle. You should have been able to finish it before the time was up. Since you didn't finish, I'll give you another puzzle." When the child was stopped again, he was told, "Well, I see you did not finish it before the time was up. You didn't finish this one either." Finally, the third puzzle was given to the child and again the child was stopped prior to completing the puzzle and told, "You did not do very well on these puzzles. You must not be very good at putting puzzles together. All the other children I asked to put these together did them correctly before the time was up."

Dependent Measures. Following the administration of success or failure tasks, each subject was then given two tasks: PUZZLE TASKS after Turnure and Zigler (1964).

The puzzle task consisted of two puzzles (adapted from the man and apple from the WISC Object Assembly). The experimenter explained, "Here are some pieces of a puzzle. When you put them together they will make something you know. I want you to put them together as quickly as you can. While you are putting yours together, I will put one together, too. But you put yours together as fast as you can. Any questions. Okay,

here's your puzzle. Begin."

As soon as the subject began working the other experimenter started the stopwatch. While the subject assembled the first puzzle the experimenter assembled another puzzle. The experimenter left the completed puzzle in view of the subject for ten seconds. If the subject had not completed the first puzzle, the experimenter repeated the cycle with the puzzle. Time required to complete the puzzle correctly and glancing scores were recorded by the second experimenter. The subject was then given the experimenter's puzzle to assemble and was told, "Here is another puzzle to put together as quickly as you can. Any questions? Begin." Time and glancing scores were again recorded.

Those subjects in the control group were given the puzzles to complete but were not given the instructions of either the success or failure group.

At completion, the TASC was given again to each subject. Following the completion of the testing, all subjects were debriefed and told that the interpolated success and failure were not a true reflection of their performance on the puzzles.

#### RESULTS

Product moment coefficients of correlation computed to examine relationships between anxiety and measures of outerdirectedness and relationships between the glancing and time scores are reported in Table 2. The number of yes responses from the first administration of the TASC failed

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Insert Table 2 about here

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to have a significant relationship with either the glancing scores or the time required to complete the puzzle. However, the number of glances and seconds to completion correlated significantly at the .001 level. Examination of these values of  $r$  suggests that the child who glanced more often took longer to complete the task. The hypothesized correlation between anxiety scores and measures of outerdirectedness was not supported.

Each dependent measure was analyzed separately in order to evaluate differences due to anxiety levels and treatment and the interaction thereof. Data for the first measure, glancing, was subjected to a two-factor analysis of variance. The second measure, time spent on puzzles was subjected to a three-factor analysis of variance with repeated measures on the third factor, puzzles. The third measure, anxiety scores, was subjected to a two-factor analysis of covariance with the first anxiety scores as the covariate. The .05 level of significance was adopted for all statistical tests.

The hypothesized effect of high anxiety and interpolated failure resulting in increased reliance on environmental cues was not supported by the first dependent measure, glancing. Neither main effect was significant ( $F = .0808$  and  $.7767$  for main effects of anxiety and treatments, respectively), nor were any significant trends among the groups identified.

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Insert Table 3 about here

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The hypothesized effect of anxiety treatment conditions, and puzzles averaged across the two puzzles, however, was partially supported. The effect of anxiety levels failed to reach statistical significance but a significant effect for treatments was found (time,  $F = 4.6083$ ,  $df = 2$ ,

$p < .01$ ). The main effect of puzzles also failed to reach significance as did any interaction among the factors. With respect to the main effect of treatments, those subjects in the control condition were found to have taken the greatest amount of time to complete the puzzles and that subjects in the failure condition took the least amount of time.

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Insert Table 4 about here

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The hypothesis that interpolated failure would have a greater effect on anxiety scores was supported when an adjustment was made for the effect of variation due to differences in prior levels of anxiety. It was found that subjects in the failure condition had higher anxiety scores than those in either the success or control conditions. Those subjects in the success group had lower anxiety scores than the control condition (anxiety scores,  $F = 8.618$ ,  $df = 2$ ,  $p < .001$ ). A significant interaction was also found between anxiety levels and treatment conditions. Those subjects in the low anxiety group had higher anxiety scores after interpolated failure than after either the success or control condition, and those in the failure group had higher anxiety scores if they were previously classified as being in the low anxiety group.

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Insert Table 5 about here

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#### DISCUSSION

The present study was designed to investigate the possibility of a relationship between levels of anxiety and measures of outerdirectedness

and the role of failure in this relationship. The investigation of outer-directedness was extended to state anxiety since it had been identified as interfering with performance and identified as a possible component of the retarded child's history of failure.

The major assumption that a positive relationship exists between anxiety and outerdirectedness was not supported by the correlational procedures that were used. Instead, negative correlations were reported that were not close to significance but could be interpreted as zero correlation. Such findings could be explained by the restricted range of scores on the anxiety test limiting the amount of variance. In addition, the subjects might have been too old to have been sensitive to the measures of outerdirectedness since it is a developmental trait and will decrease with age or the initial testing situation might have had little value to the subjects and the typically high-anxious subjects may have felt little pressure. An alternative explanation has been offered by MacMillan & Wright (1974) that measures of the PUZZLE TASK may be measures of distractibility rather than of outerdirectedness. The TASC may have been subject to the effects of distractibility as the EMR subjects may have lost interest in participating and may have given the most expedient answer rather than the most accurate. A test of split-half reliability on the TASC should be conducted to test this hypothesis. A lie and defensiveness scale should also be administered with the TASC to account for any discrepant scores. The findings of the study regarding the relationship between glancing and time scores, however, were supportive of those reported by Keogh et al. (1972). Those subjects who glance a great deal are also those who spend more time completing the puzzle.

In addition to the lack of correlational evidence of a relationship between anxiety and outerdirectedness, no effect of anxiety levels or treatment condition on glancing scores were found. Interpolation of success, failure or control conditions had no significant effect on the degree of outerdirectedness as measured by glancing scores. Since puzzles were used in both the interpolated conditions and as dependent measures, this procedure may be criticized for using tasks of such similarity. Butterfield & Zigler (1965) make this point and use it as an explanation for inconsistent findings among studies which experimentally induce success and failure. MacMillan & Wright (1974) suggest that greater attention should be given to differing methods of inducing failure, transference effects to various dependent tasks, and the possibility that populations may differ in the potency of failure experiences as a result of differing histories of failure (MacMillan & Cauffman, 1973).

The inconsistency of interpolated success and failure condition to have an effect is also demonstrated when time spent on the puzzles was used as the dependent measure. Results were found which contradicted previous studies (MacMillan & Wright, 1974). Instead of subjects in the failure condition taking the greatest amount of time to complete the puzzles, failure subjects in this study took the least amount of time. Since the results did not account for successful or unsuccessful completion the failure group may not have been accurate in their performance. Interpolated failure may have had the effect of causing subjects to work quickly in order to terminate a stressful situation. This explanation may be supported by the fact that subjects in the failure condition

manifested more anxiety than those in either the success or control condition.

As previously reported, no initial relationship was identified between anxiety and measures of outerdirectedness. However, when the initial anxiety score was controlled for, significant differences were noted with those subjects in the failure condition and in the low-anxiety groups becoming more anxious after the interpolated failure. This suggests anxiety may be more situation specific than a general state of being. It might also suggest that the TASC may be more reflective of anxiety when the situation is clearly defined to the subject, and not a good measure of hypothetical anxiety-producing situation.

The preliminary results indicate that anxiety levels do not have any direct relationship with measures of outerdirectedness. It is suggested, however, that anxiety levels of retarded children as measured by the TASC should be investigated further as should the appropriateness of this measure with children in special vs. regular classes. It was reported that failure situations do increase anxiety, as hypothesized, and that subjects with previously reported low-anxiety are most susceptible to an increase when experiencing failure.

The tentative findings of the present study supports the suggestion of more systematic investigation into the interpolation of success and failure experiences and into the measure of outerdirectedness. Lack of substantial evidence in the areas of interest in this study should not deter the researcher who is interested in problem-solving styles of EMR children but should serve as a catalyst for future research.

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Table 1  
Summary Table of Subjects Characteristics

N	CA	MA
36	$\bar{x}$ 122 months sd 9.76	90.70 months 25.34

Table 2

Pearson  $r$  for TASC Scores, Time, and Glances  
on Puzzle 1 for Total N

Puzzle	Total N N = 95
TASC Scores - Total Time	-.0124
TASC Scores - Total Glances	-.0931
Total Time - Total Glances	.5111*

\*  $p < .01$

Table 3

Analysis of Variance of WISC Puzzle Task for  
Anxiety Levels X Treatments on Glancing

Source of Variation	df	MS	F
A (Anxiety)	1	.44444	.0808
B (Treatments)	2	4.19445	.7767
AB	2	9.19432	1.7025
Within Replicates	30	5.40000	
Total	35		

Table 4  
 Analysis of Variance of Time  
 Measures in 2 Puzzle Trials

Source	df	MS	F
Between-subjects	1	171697.5000	71.96231
Anxiety (A)	1	924.4375	.3874
Treatment (B)	2	10995.0312	4.6083*
AB	2	1398.2500	.5860 <sup>a</sup>
Error	30	2385.9062	
Within-subjects			
Puzzles (C)	1	8191.8750	3.5495
A x C	1	234.6875	.1016
B x C	2	1560.0625	.6759
A x B x C	2	2909.6250	1.2607
Error	30	2307.8833	

\*  $p < .01$

**Table 5**  
**Analysis of Covariance on TASC Scores:**  
**Final Scores Adjusted by Initial Scores**

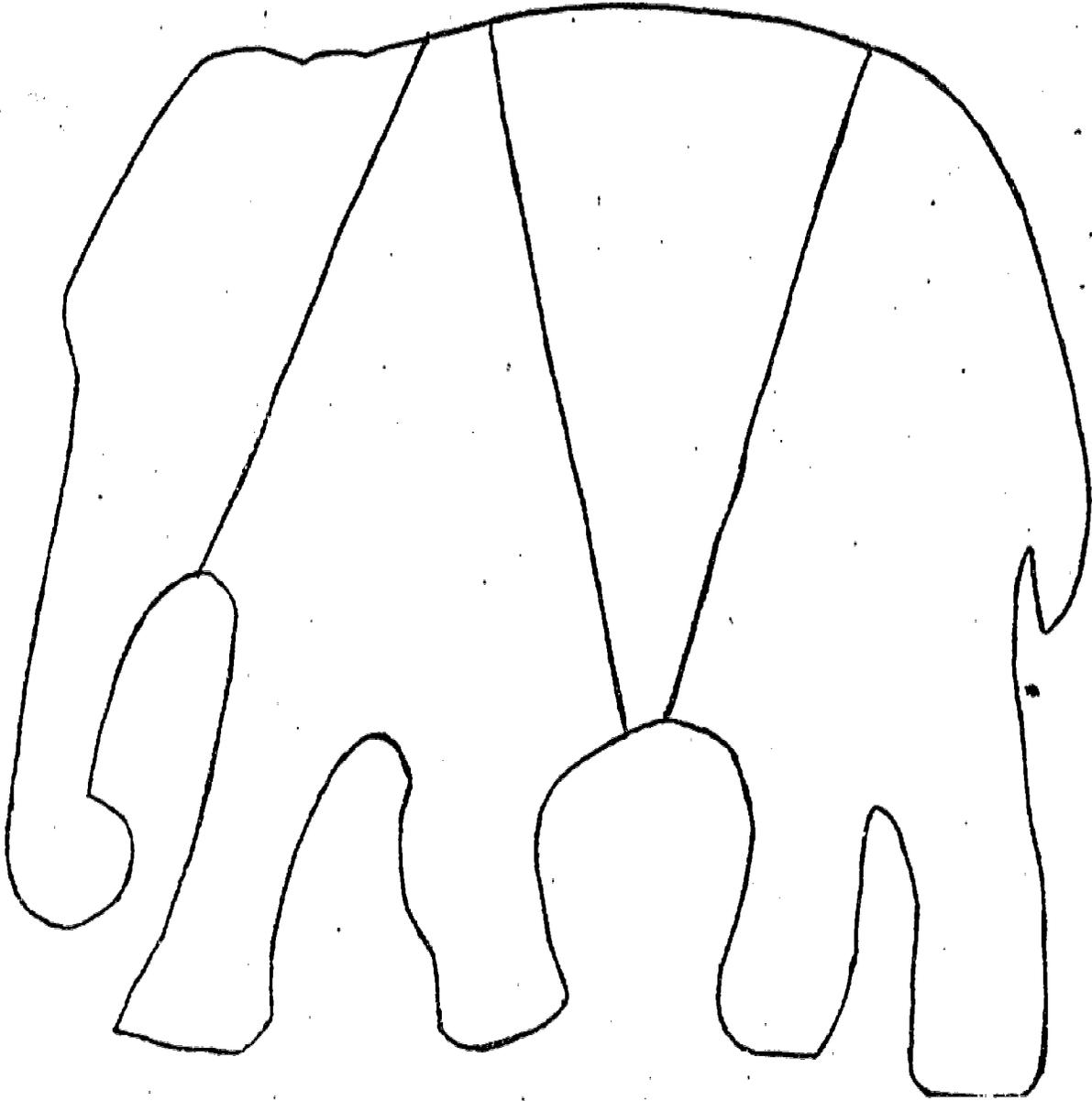
Source	df	MS	F
Mean	1	26.57788	2.66403
Anxiety (A)	1	41.08765	4.11841
Treatments (B)	2	85.97998	8.61819**
A x B	2	34.01965	3.40995*
Covariate	1	691.01294	69.26357
Error	29	9.97657	

\*\*  $p < .001$

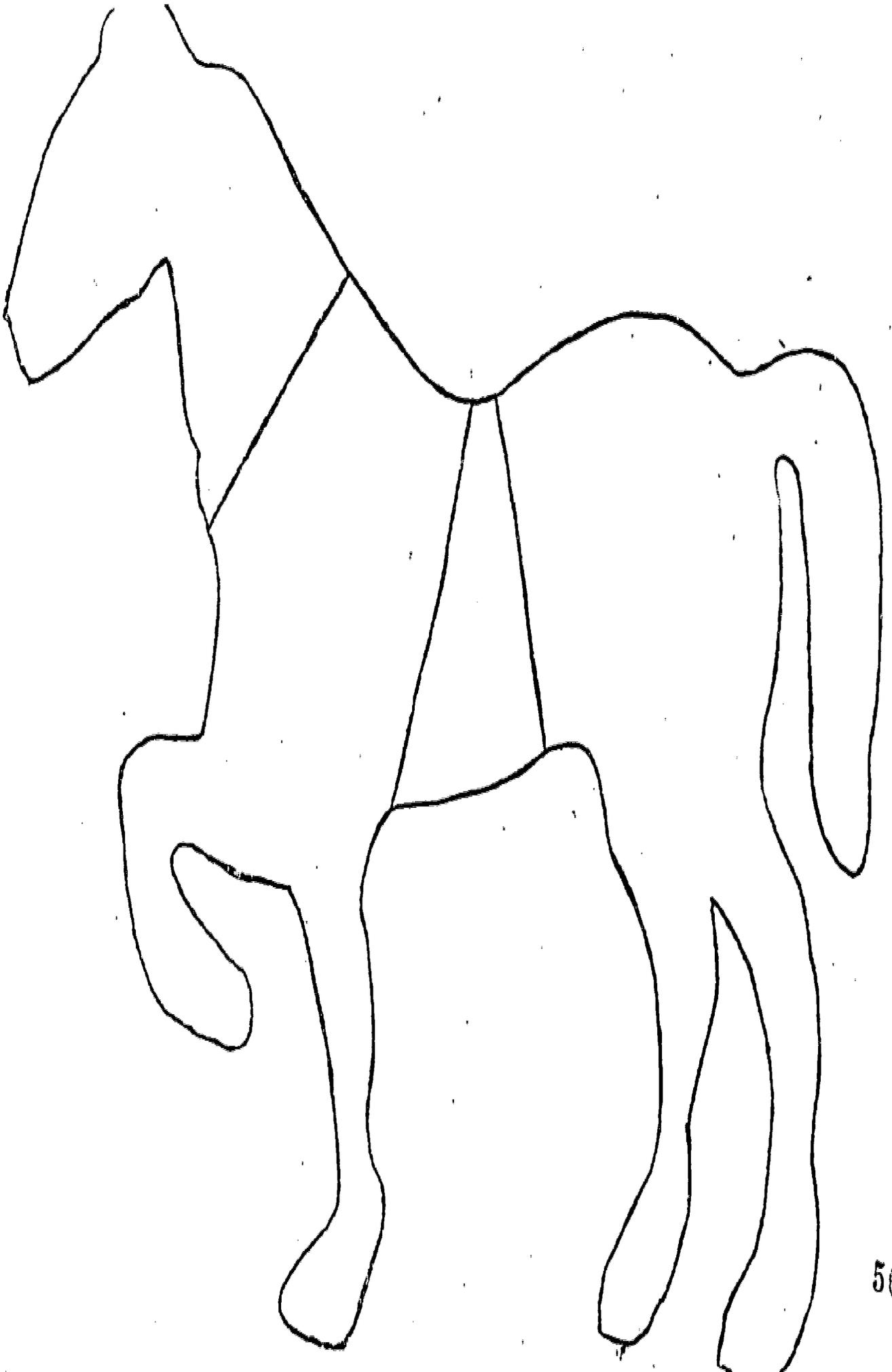
\*  $p < .05$

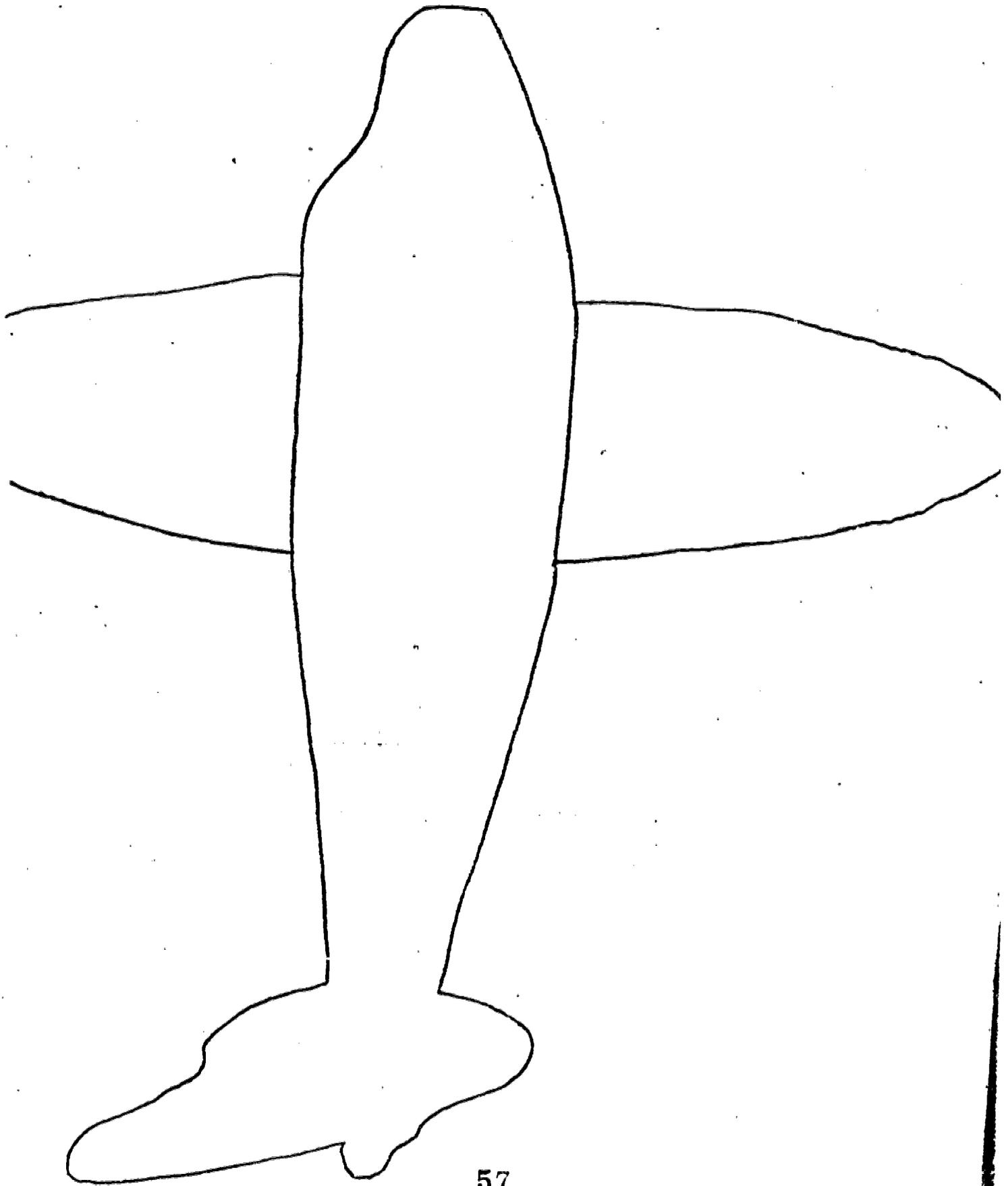
**APPENDIX A**

Elephant puzzle



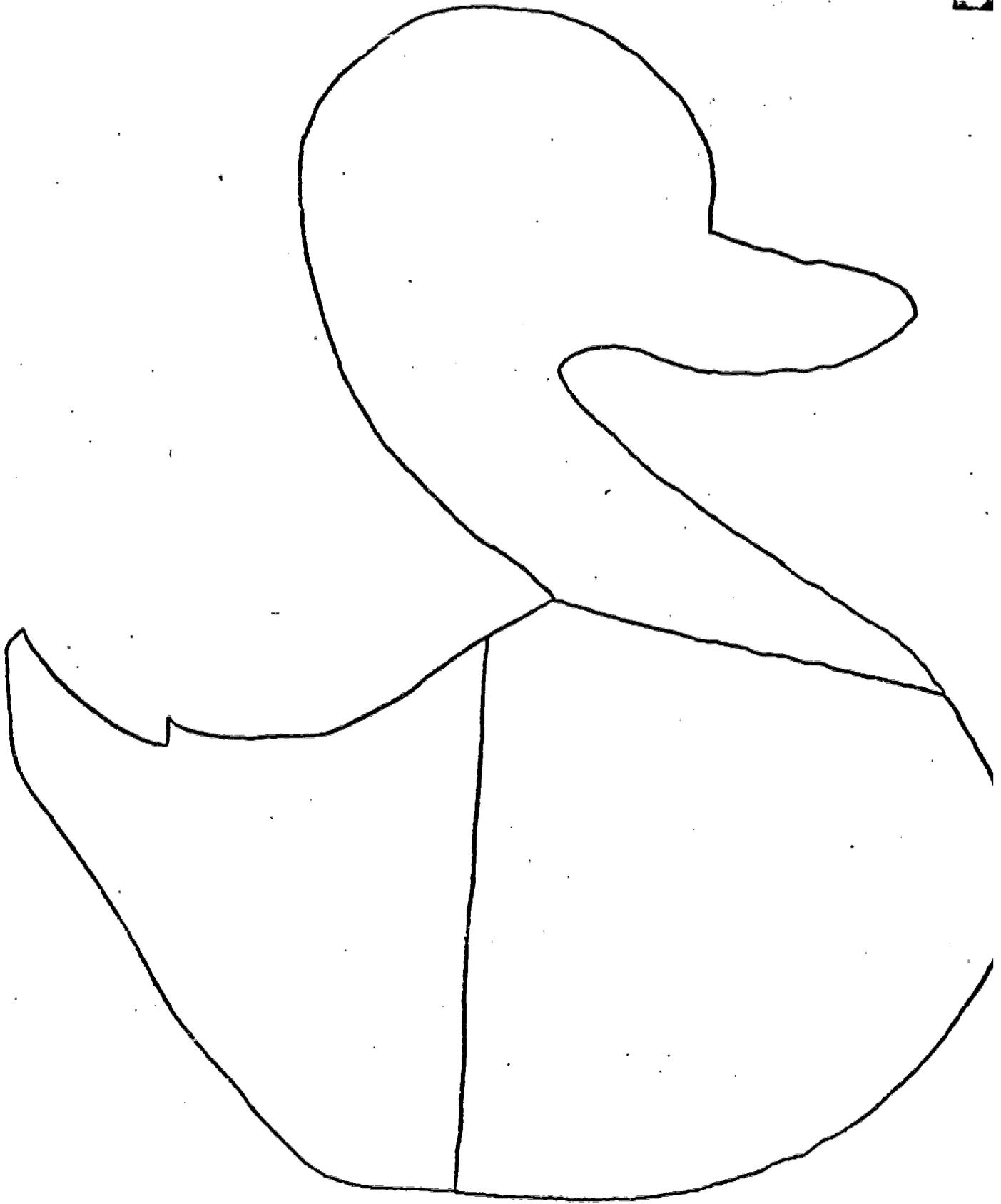
Horse Puzzle



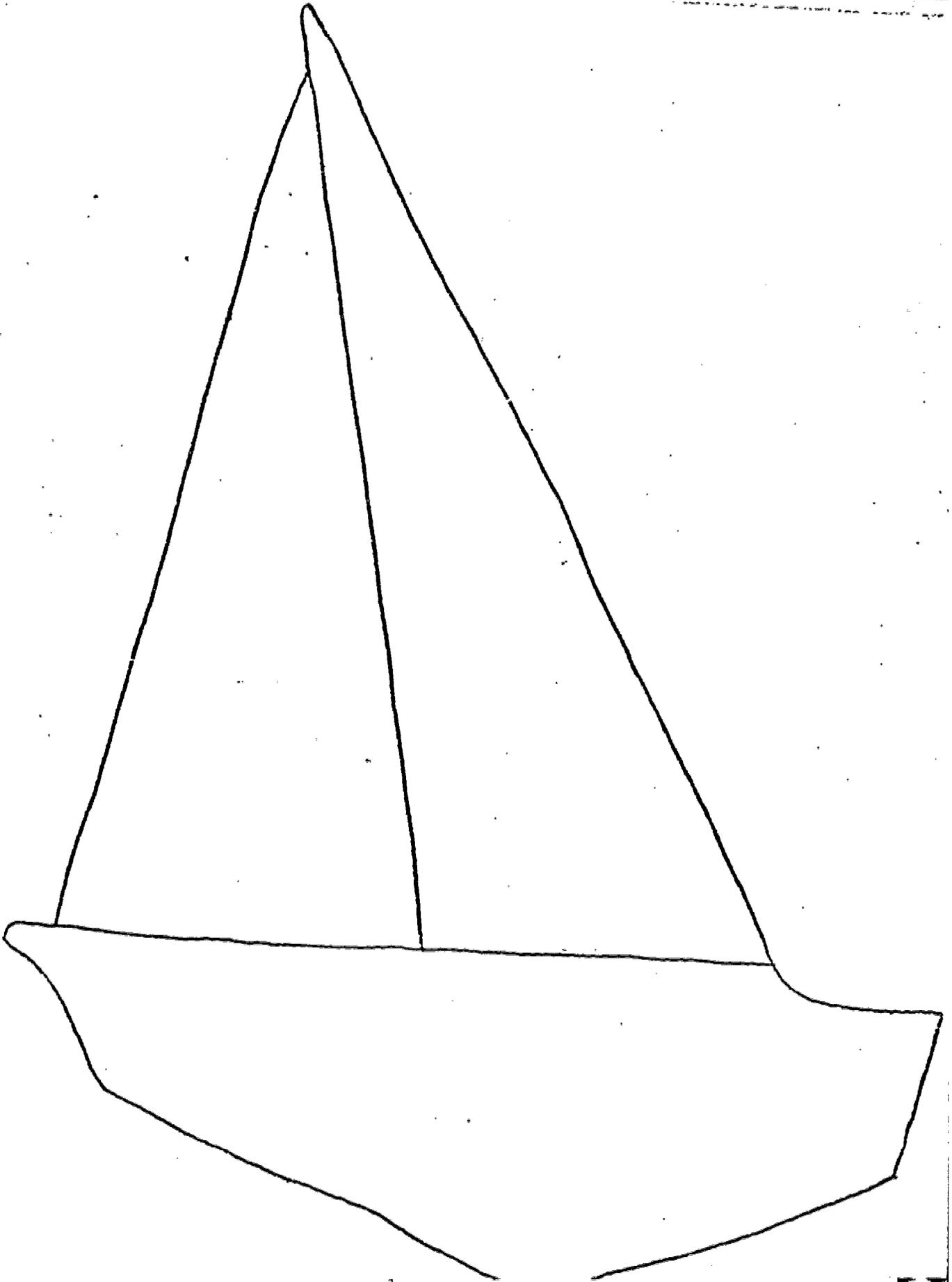


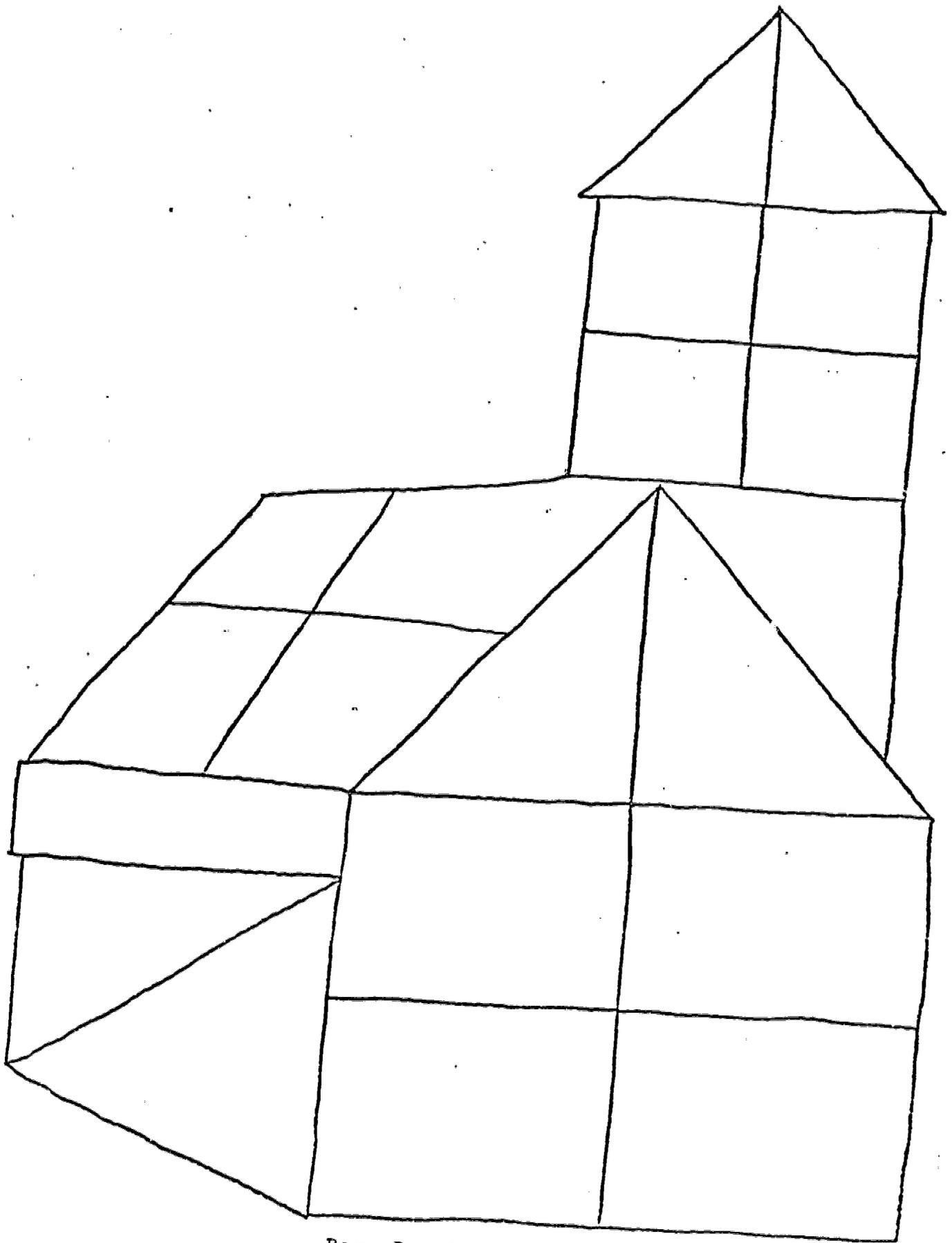
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Airplane Puzzle

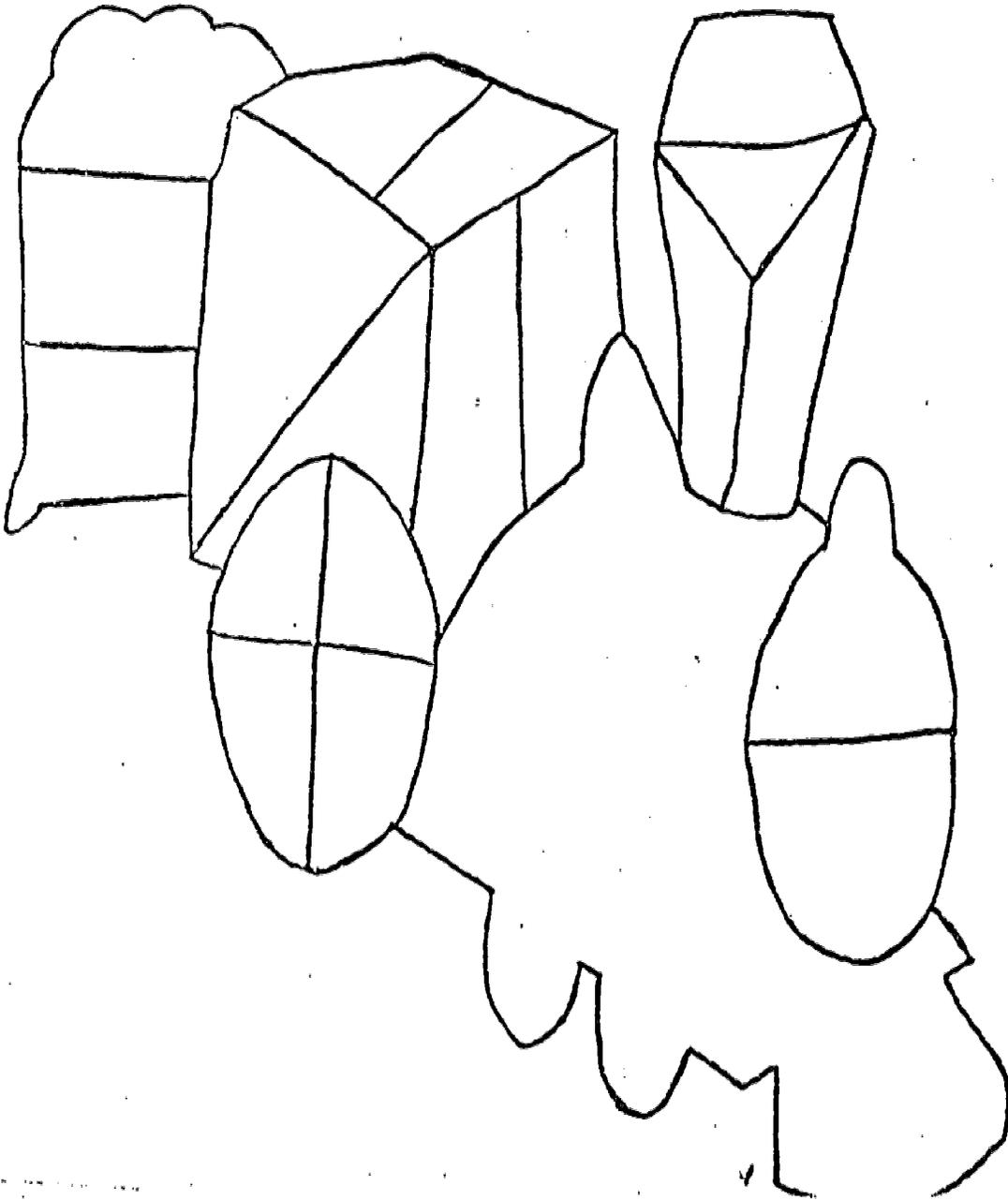


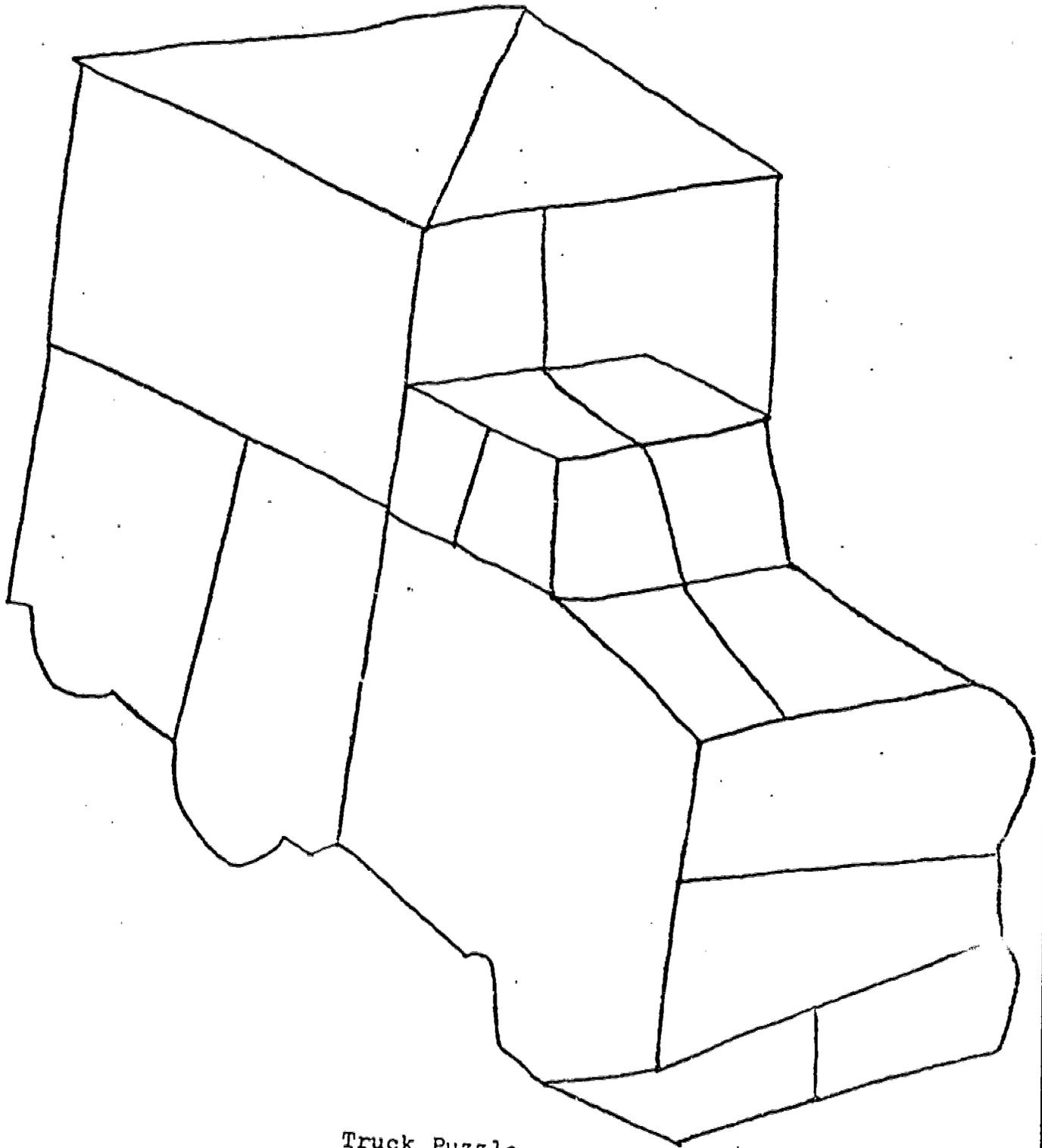
Duck Puzzle



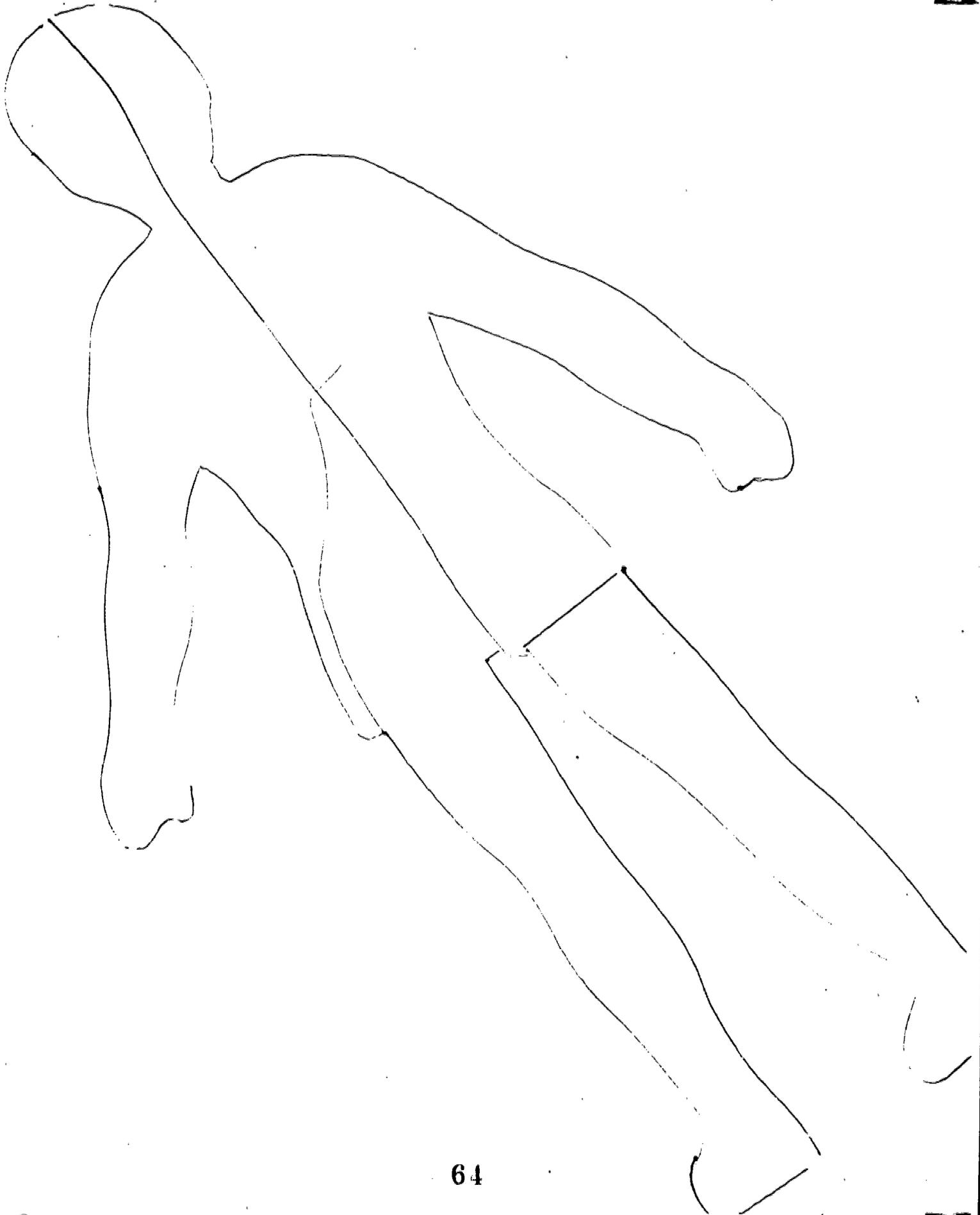


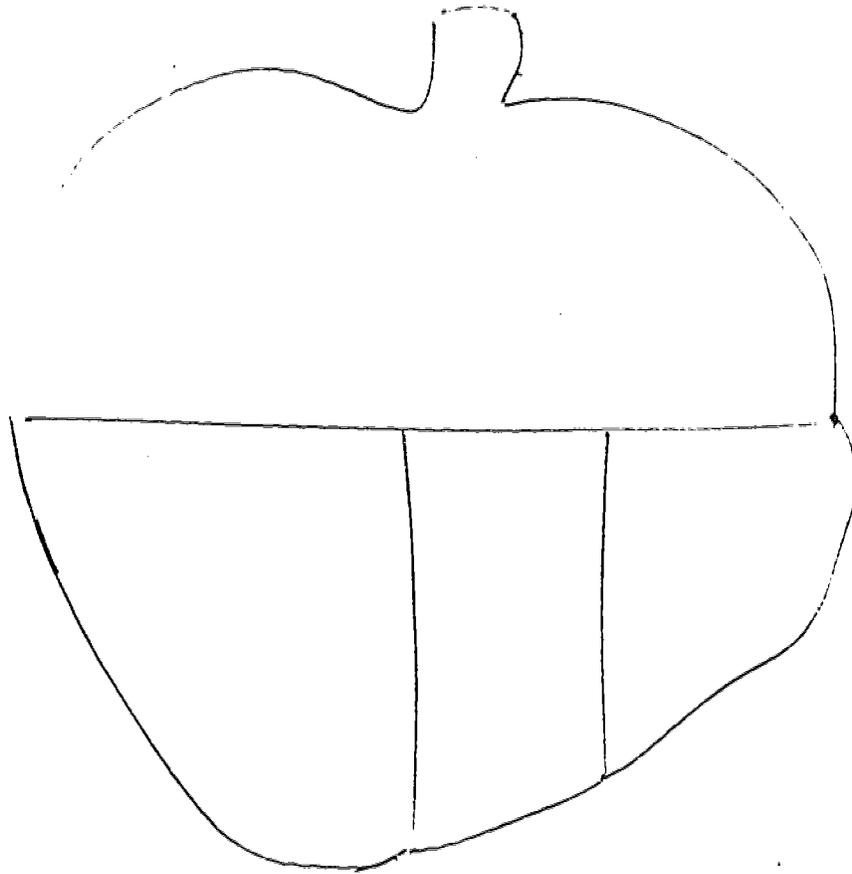
Barn Puzzle





Truck Puzzle





**APPENDIX B**

## Instructions for Pilot Test

1. Take the subject individually to a room containing a table and three chairs. Direct the subject to the chair on the right and then you sit to the left of the subject.
2. Introduce yourself and begin reading instructions to the test.

My name is Mrs ~~Smith~~. I'm going to be asking you some questions - questions different from the usual school questions, for these are about how you feel and so have no right or wrong answers. People think and feel differently. For example, if I asked you this question: "Do you like to play ball?", some of you would put ~~a circle~~ around "yes" and some of you would put ~~a circle~~ around "no". Your answer depends on how you think and feel.

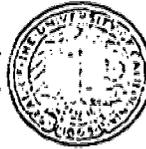
No one but myself will know your answers to these questions, not your teacher, nor your principal nor your parents. If you don't understand a question, ask me about it. Now, let's start.

Test Anxiety Scale for Children

1. Do you worry when the teacher says that she is going to ask you questions to find out how much you know?
2. Do you worry about being promoted, that is, passing from one grade to the next?
3. When the teacher asks you to get up in front of the class and read aloud, are you afraid that you are going to make some bad mistakes?
4. When the teacher says she is going to call on some boys in the class to do arithmetic problems, do you hope she will call on someone else and not on you?
5. Do you sometimes dream at night that you are in school and cannot answer the teacher's questions?
6. When the teacher says she is going to find out how much you have learned, does your heart begin to beat faster?
7. When the teacher is teaching you about arithmetic do you feel that other children in the class understand her better than you?
8. When you are in bed at night, do you sometimes worry about how you are going to do in class the next day?
9. When the teacher asks you to write on the blackboard in front of the class does your hand sometimes shake?
10. When the teacher is teaching you about reading, do you feel that other children in the class understand her better than you do?
11. Do you think you worry more about school than other children?

12. When you are at home and you are thinking about your arithmetic lesson for the next day, do you become afraid that you will get the answers wrong when the teacher calls on you?
13. If you are sick and miss school, do you worry that you will do more poorly in your schoolwork than other children when you return to school?
14. Do you sometimes dream at night that other boys and girls in your classroom can do things that you cannot do?
15. When you are home and you are thinking about your reading lesson for the next day, do you worry that you will do poorly?
16. When the teacher says that she is going to find out how much you have learned, do you get a funny feeling in your stomach?
17. If you did very poorly when the teacher called on you, would you probably feel like crying even though you would try not to cry?
18. Do you sometimes dream at night that the teacher is angry because you do not know your lessons?
19. Are you afraid of school tests?
20. Do you worry a lot before you take a test?
21. Do you worry a lot while you are taking a test?
22. After you have taken a test, do you worry about how well you did on the test?
23. Do you sometimes dream at night that you did poorly on a test you had in school that day?
24. When you are taking a test, does your hand shake a little?
25. When the teacher says she is going to give the class a test, do you become afraid that you won't do well?
26. When you are taking a hard test, do you forget some things you knew very well before you started taking the test?
27. Do you wish a lot of times that you didn't worry so much about tests?
28. When the teacher says she is going to give the class a test, do you get a nervous or funny feeling?
29. While you are taking a test, do you usually think you are doing poorly?
30. While you are on your way to school, do you sometimes worry that the class may have a test?

**APPENDIX C**



DEPARTMENT OF EDUCATION

RIVERSIDE, CALIFORNIA 92502

January 19, 1976

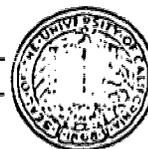
Dear Parents:

I am a Doctoral student in Special Education (University of California, Riverside) and have been given a federally funded grant to study how children are motivated and how this motivation influences the way they solve problems. Specifically, I am interested in studying how levels of anxiety are related to outdirectedness, an identified problem-solving style of educable mentally retarded children. By means of this letter, I am asking your cooperation and permission to allow your child to participate in my study. The consent form which follows this letter will explain the details of my study and will give you an opportunity to decide whether you would like your child to be in my study. I feel that this is a worthwhile study and will benefit children by attempting to improve future teaching techniques. If you have any questions after reading the consent form, please feel free to call me at (213) 825-0159.

Sincerely,

A handwritten signature in cursive script that reads "Victoria L. Graf".

Victoria L. Graf, M.A.



DEPARTMENT OF EDUCATION

RIVERSIDE, CALIFORNIA 92502

## CONSENT FORM FOR MOTIVATIONAL CHARACTERISTICS STUDY

We, the undersigned, parents of \_\_\_\_\_, hereby agree to allow our child to participate in a study investigating the possible relationship of levels of anxiety and outerdirectedness, a characteristic problem-solving style of educable mentally retarded children. We understand that this study will consist of collecting information by way of a questionnaire which requires a yes or no response to items concerned with attitudes toward and experience in test and test-like situations and the completion of simple puzzle tasks. This information will be gathered by trained representatives working under the supervision of Victoria L. Graf, M.A., Doctoral Student in Special Education (University of California, Riverside). The amount of time necessary for the participation of our child will be a total of one hour which will be divided into two ½ hour sessions within a period of two weeks.

We understand that the purpose of this study is to begin the investigation of the possible relationship between motivational characteristics such as anxiety and the manner in which children solve problems. This information is for the purpose of improving future teaching techniques, and we understand that our child will receive no direct benefit from this investigation at the present time. This investigation serves as a basis for future research in this area which hopefully will result in improved methods of teaching and increased learning for children.

We also agree that the data gathered may be used in such manner as may be desirable for teaching, publications or research purposes, but that all information will be coded and reported as group averages and that at no time will our child be named in any reports or presentations. We also understand that the giving of our permission to allow the gathering of information from school records such as intelligence test scores, length of time in program, chronological age, etc. to be used in a confidential manner for the reporting of group averages is optional. Our approval or disapproval is indicated in the box below. We also understand that our child will have the procedures of the study explained to him/her at the termination of the study to prevent any misunderstandings. The importance of confidentiality will be stressed to all project staff and to our child's teacher.

We understand that any inquiries we have concerning project procedures will be welcome at any time and that we may call the investigator named above at (714) 835-0159 for questions regarding project procedures. We are also aware that we may withdraw our child from this study whenever we wish.

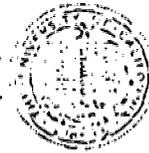
\_\_\_\_\_ We approve the recording of information from school records such as intelligence test scores, length of time in program, chronological age, etc., if used in a confidential manner for the reporting of group averages and if our child will not be named in any reports or presentations.

\_\_\_\_\_ We do not approve the recording of information from school records.

_____	_____	_____	_____
Mother	Date	Guardian or Other (Specify)	Date

_____	_____	_____	_____
Father		Guardian or Other (Specify)	Date

January/1976



NEURO-PSYCHIATRIC INSTITUTE  
THE CENTER FOR THE HEALTH SCIENCES  
760 WESTWOOD PLAZA  
LOS ANGELES, CALIFORNIA 90024

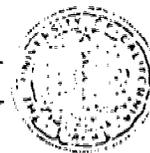
26 de Enero de 1976

Estimados padres:

Soy una estudiante preparando mi doctorado en Educación Especial (Universidad de California, Riverside) y he recibido una donación otorgada por el gobierno federal con el objeto de estudiar como los niños son motivados y como esta motivación influye la manera de como solucionan ellos sus problemas. Específicamente estoy interesada en estudiar como los niveles de ansiedad estan relacionados con la externalización, lo cual se ha identificado como un estilo utilizado por los niños retardados mentales pero educables en la solución de sus problemas. Por medio de esta carta solicito su cooperación y permiso para que permita a su hijo(a) participar en este estudio. El Consentimiento que acompaña esta carta le explicará los detalles de mi estudio y le dará una oportunidad para decidir si le gustaría o no que su hijo(a) participe en mi estudio. Estimo que este es un estudio de valor y que beneficiará a los niños al tratar de mejorar las futuras técnicas de enseñanza. Si despues de leer el consentimiento usted tiene alguna pregunta por favor llámeme al teléfono (213) 825-0159.

Sinceramente,

*Victoria L. Graf*  
Victoria L. Graf, M.A.



NEURO-PSYCHIATRIC INSTITUTE  
THE CENTER FOR THE HEALTH SCIENCES  
760 WESTWOOD PLAZA  
LOS ANGELES, CALIFORNIA 90024

### CONSENTIMIENTO PARA EL ESTUDIO DE LAS CARACTERISTICAS DE LA MOTIVACION

Nosotros, que al final firmamos, padres de \_\_\_\_\_ por medio de la presente aceptamos que nuestro(a) hijo(a) participe en un estudio destinado a investigar la posible relacion que existe entre los niveles de ansiedad y la externalización, un estilo característico de como los niños retardados mentales pero educables solucionan sus problemas. Comprendemos que este estudio consiste en coleccionar informacion por medio de un cuestionario el cual requiere respuestas si o no concernientes a preguntas relacionadas con actitudes hacia los tests, experiencias en tests y situaciones similares y la terminación de tareas relacionadas con rompecabezas. Esta informacion será recopilada por medio de personal entrenado que trabaja bajo la supervisión de Victoria L. Graf, M.A., Estudiante Doctoral en Educacion Especial (Universidad de California, Riverside). El tiempo necesario para la participacion de nuestro(a) hijo(a) será de un total de una hora la cual será dividida en dos sesiones de media hora cada una, en un período de dos semanas.

Comprendemos que el propósito de este estudio es iniciar una investigación de la posible relacion que existe entre las características de la motivación, tales como la ansiedad, y la manera por medio de la cual los niños resuelven sus problemas. El propósito de esta informacion es mejorar las futuras técnicas de enseñanza y comprendemos que nuestro(a) hijo(a) no se beneficiará en el presente de esta investigación. Este estudio servirá como base para futuras investigaciones en esta area, lo cual es de esperar resulte en mejores métodos de enseñanza para aumentar el aprendizaje de los niños.

Tambien aceptamos que la informacion obtenida sea utilizada de tal manera como se estime conveniente ya sea en enseñanza, publicaciones o investigaciones, pero que toda informacion sea presentada en clave y reportada como un promedio de grupo y que en ningun momento se mencione el nombre de nuestro hijo ya sea en reportes o presentaciones. Tambien comprendemos que nuestro permiso es opcional de permitir la recopilación de informacion de los archivos de la escuela tales como puntajes de tests de inteligencia, período de tiempo en el programa, edad cronológica, etc. los cuales seran utilizados en forma confidencial y reportados como promedio de grupo. Al final del presente consentimiento, hemos indicado nuestra aceptación o negativa para la recopilación de informacion, de los archivos de la escuela. Tambien comprendemos que al final se le explicará a nuestro(a) hijo(a) los procedimientos empleados en el estudio para evitar malentendidos. Tanto los funcionarios que participan en este proyecto como la profesora de nuestro(a) hijo(a) seran instruidos en mantener estricta confidencia.

Comprendemos que cualquier pregunta que tengamos referente a los procedimientos empleados en el proyecto será contestada con prontitud y que podemos llamar a la persona que dirige esta investigación (Victoria L. Graf) al teléfono (213) 825-0159 cuando tengamos alguna pregunta referente a los procedimientos que se utilizaran en el proyecto. Tambien entendemos que podemos retirar a nuestro(a) hijo(a) del estudio en el momento que deseemos.

