

**"COGNITIVE IMPULSIVITY" IN MEXICAN-AMERICAN, NEGRO,
AND ANGLO-AMERICAN SCHOOL CHILDREN**

by

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ABSTRACT

Third grade boys' performance on a cognitive measure of "reflection-impulsivity" and level of aspiration was studied in relation to middle and lower socio-economic class status and to Anglo-American, Mexican-American and Negro ethnic background. In addition, the results of this study were compared and combined with a similar study made by Rosenblatt (1968).

The subjects, 134 third grade boys, were born in the United States. The Mexican-American boys had fathers or grandfathers who were born in Mexico. All of the subjects were administered Kagan's Matching Familiar Figures test and their level of aspiration on this test was ascertained.

Results show that the ethnic groups were significantly different from one another and that there are differences between the middle and lower socio-economic classes on the "reflection-impulsivity" variable. Also the third grade Anglo and Mexican-American boys followed the same pattern of "reflection-impulsivity" that was found to be significant in the Rosenblatt study (1968).

A comparison of this study of third grade children with the Rosenblatt study of first grade children indicates a slight change between the class-ethnic groups after two years of formal education. Class and ethnic group membership do determine differences in cognitive impulsivity which are less on the third grade level than on the first grade level.

INTRODUCTION

One of the more important dimensions of cognitive style investigated in recent years is that of "reflection-impulsivity." The principal studies in the area are those published by Jerome Kagan (Kagan 1965a, 1965b, 1965c; Kagan, Moss, and Sigel 1963; Kagan, Pearson, and Welch 1966; Kagan et al. 1964). Kagan's measures and ideas relating to cognitive style have developed through many studies and several different tests. He has investigated styles of conceptualization, analytic and reflective attitudes, response uncertainty, conceptual tempo, conceptual impulsivity, and "reflection-impulsivity." He has shown that these factors are stable over time and generalize across some tasks. He has also studied body build and cardiac and respiratory correlates of his concepts.

The concept of impulsivity as a personality dimension has been investigated by Barratt (1965) and Sutton-Smith and Rosenberg (1959). The Barratt Impulsivity Scale and the Sutton-Smith and Rosenberg Impulsivity Scale are the results of attempts to differentiate an impulsivity factor with a personality questionnaire. Other personality questionnaires such as Cattell's Early School Personality Questionnaire (ESPQ) have also been used to study impulse control (Rosenblatt 1968).

Rosenblatt (1968) in a recent study reported only a slight relationship between the personality and the cognitive dimensions of impulsivity. Rosenblatt studied Anglo-American and Mexican-American

middle and lower classes. She found that results for the Mexican-American lower class were contradictory. This group was identified as "impulsive" using Kagan's Matching Familiar Figures cognitive test, but on Cattell's ESPQ test few of the personality characteristics which are generally considered impulsive were demonstrated to be characteristic of the group.

The present research deals almost exclusively with the cognitive dimension of "reflection-impulsivity" and its relation to socioeconomic level, ethnic variables, and level of aspiration.

A Cognitive Measure of Impulsivity

Kagan (Lee, Kagan, and Rabson 1963) has worked with the initial step in the cognitive process (the initial categorization of external information) from several viewpoints. He found that there are individual differences in the cognitive products of children. These differences depend in part upon the children's preference in the initial processing of information and are independent of acknowledged differences in their knowledge repertoire (p. 441). For example, he found that the "analytic" boys (those who matched stimuli based on parts of the total stimuli) learned analytic concepts more readily than the nonanalytic boys.

Kagan's (Kagan, Moss, and Sigel 1963) interest in the interaction between perceptual organization of stimuli, the conceptual process, and the importance of stable individual differences in the mode of cognitive function was applied to research in "cognitive style." Cognitive style refers to an individual preference in the mode of perceptual organization and conceptual categorization of the external

environment. An example of this is a child's tendency to analyze and differentiate stimuli on the basis of their parts rather than on the basis of the stimuli as a whole. Kagan suggests that there are antecedents of the analytic style which may be found in parent-child interaction.

Hess and Shipman (1965) studied the interaction of Negro middle-class and lower-class preschool children and their mothers while they were doing learning tasks. They found that the middle-class mothers whose verbalizations were extensive and whose behavior was supportive and encouraging rather than restrictive and controlling had children who learned faster and better than the lower-class children. The lower-class children whose mothers were not as able to vocalize were more impulsive and passive and had fewer verbal abilities.

In a more recent study (Kagan et al. 1964) Kagan reports generality and stability in two basic cognitive dispositions: (1) the tendency to analyze visual arrays and (2) the tendency to reflect upon alternative solution hypotheses in situations where the alternative response possibilities are available simultaneously. At this time Kagan began using the Matching Familiar Figures Test (MFF). He found that analytical children made fewer recognition errors on this MFF task which requires complex perceptual discrimination.

Kagan (1965a, 1965b) then studied the relationships between reaction time and degrees of stimulus uncertainty. His studies showed "intraindividual consistency in speed of decision time across varied tasks and the stability of decision time over short and long periods" (1965a, p. 155). As a result of these observations a cognitive dimension called "reflection-impulsivity" was postulated.

Several important clarifications should be made at this time.

1. The generalized tendency toward reflection or impulsivity holds only for situations in which several alternatives are presented simultaneously and it is not immediately obvious which alternative is correct. "Conceptual tempo" can be present only in cases of response uncertainty (1965b). The "reflection-impulsivity" dimension describes the degree to which a child reflects upon the differential validity of the alternatives under these conditions.
2. A basic assumption in this research (Kagan 1965a, 1965b) is that response times to specific tasks (including the MFF test) are a faithful reflection of decision times. Kagan is working on the difficult task of providing objective and unambiguous support for the hypothesis that long response latency is an index of long decision time.

Children with fast conceptual tempos impulsively report the first hypothesis that occurs to them. This response is typically incorrect. The "reflective" child considers the alternatives available and evaluates their differential validity. He takes a long time to respond and typically makes fewer errors than the "impulsive" child (Kagan 1966). The "reflective" child wants to avoid making errors, whereas the "impulsive" child is not concerned about mistakes (Kagan, Pearson, and Welch 1966).

Work with the correlation of scores on intelligence subtests (Wechsler Intelligence Scale for Children) has shown little relationship between verbal skills and reaction time on the MFF test. Research

(Kagan 1965b) also suggests that a tendency for reflectivity increases with age, is stable over periods as long as twenty months, manifests pervasive generality across varied task situations, and is linked to some fundamental aspects of the child's personality organization. The most sensitive test for measuring the "reflection-impulsivity" variable is the MFF test (Kagan 1966; Kagan et al. 1966).

Socio-economic and Ethnic Variables in
The Conceptual-perceptual Dimension

Kagan's interest has been in individual differences and characteristics of his "reflection-impulsivity" postulates. He has studied children in several grade levels without concern for their socio-economic or ethnic backgrounds. Other researchers (Bruner 1961; Deutsch 1963 and 1965; Boney 1967; Freeberg and Payne 1967; Odom 1967) offer some indication of difficulties the socially and educationally deprived child has in problem-solving situations.

It is generally agreed that the lower socio-economic class children are at a disadvantage when presented with cognitive tasks. The factors attributed to this disadvantage vary with different authors. Jensen (Freeberg and Payne 1967) believes the disadvantage may be attributed to the verbal deficiency of the lower classes. Hess and Shipman (1965) add that the verbal quality of the mother-child interaction influences the child's readiness to learn new concepts.

Boney (1967) and Deutsch (1963, 1965) feel that perceptual abilities handicap lower-class learning. Boney reports that Negro children from disadvantaged areas see little relevance in using comparisons

in their descriptions. He hypothesized that their environment is so depressing that close examination of their surroundings creates a discomfort so they do not acquire a facility for observing and describing objects carefully. Deutsch agrees and adds that learning deficiencies are attributed to inferior habits of hearing, seeing, and thinking. These children are deprived of sufficient variety of stimuli to which they are capable of responding. Stimulation that is available has poorer and less systematic sequential ordering and is less useful to the activation of cognitive potential. The sparsity of objects and the lack of diversity prohibit the children from perceptually organizing nuances of their environment. Lower-class children are relatively poorer in recognizing perceptual similarities. Since the MFF test is essentially a test of the recognition of perceptual similarities it is expected that these children will be handicapped.

Bruner (1961) in his studies of cognitive consequences of sensory deprivation found that the children of depressed areas are handicapped not only in constructive models in the environment but also in developing strategies for evaluating information. Odom (1967) in his study with 5-6 and 10 year olds confirms this finding and states that the decrease of differences in performance between socio-economic groups with increasing age may be due to an increase in the number of experiences being provided by schools.

The presentation of these studies is an attempt to provide some basis for the expectations of the Negro groups used in the present study. There has been no research with this group and the "reflection-impulsivity" dimension. It is expected that the Negro groups and lower

classes in this study will make more errors and take shorter time to respond than their respective middle-class ethnic groups. Their deficiencies in perception handicap their ability to recognize and identify similarities in the MFF items. There are subtle similarities in some of the items. The lower classes also have less experience than the middle class (who have more variety in their environment) in developing strategies of discrimination so they will take less time to consider the alternatives presented in the items.

There have been few studies concerning the personality characteristics and problem-solving techniques of the Mexican-American children. Most of the studies have investigated differences in intelligence. Stoker (1965) reported on the Spanish-American children from records in a Child Guidance Clinic. He found that Spanish-American boys were more hyperactive, impulsive, negative, and obstinate than were the Anglo-American boys. Rosenblatt (1968) has investigated impulse control in first-grade children of Anglo-American and Mexican-American middle-class and lower-class groups. In addition to personality and delay of gratification measurements, she also used Kagan's MFF test. She found that the lower-class Mexican-American children were more impulsive than the other three groups. There were no significant differences between the middle-class Anglo and Mexican-American and the lower-class Anglo Boys. The Rosenblatt study is closely related to the present study. The results of these two studies will be compared in order to give more meaning to the findings of both.

In the present investigation the Matching Familiar Figures test will be used, upon Kagan's personal suggestion, as the measure of

reflection-impulsivity. The measures of reflection include a long reaction time and a low number of errors. The measures of impulsivity include a short latency of response and a large number of errors. Negro and Mexican-American ethnic groups will be compared with the Anglo group and both middle-class and lower-class subjects are compared.

In addition to the "reflection-impulsivity" dimension, the level of aspiration of the three ethnic groups and the two socio-economic groups will be investigated. Research on the level of aspiration will be discussed and on the basis of the combined research sections the hypotheses of this study will be presented.

Level of Aspiration

There have been many studies which have investigated the level of aspiration as a dimension of personality. Lewin is the investigator initially associated with the aspiration concept. Rotter (1942) presented a critical review of past and "more recent" studies. He is concerned with the methodology used in these studies and gives several good suggestions for future studies. Frank (1941) also makes several good contributions. In his review of aspiration studies he redefines Lewin's level of aspiration. According to this author, the level of aspiration represents "the level of future performance in a familiar task which an individual explicitly undertakes to reach" (p. 236). In all the studies the subjects are given some familiarity with the material before they are asked to indicate their level of aspiration. Procedures include practice trials or statements about the task.

Gray (1944) studied the vocational preferences of Negro school children in grades one through six and found that the Negro male was more interested in professional occupations than the white males. Negro children were less realistic than the whites in that they were interested in jobs which they could not obtain. They had little opportunity for training for these occupations and they had little knowledge of the steps they would have to take to train for them. Anotonovsky and Lerner (1959) studied 16-20 year olds in a small city with a stable Negro population. They found that the lower-level Negroes had higher occupational aspirations than the lower-level whites. Anotonovsky (1967) studied the Negro, white, and Puerto Rican populations in a large city to see if he would find similar results. He reported (using his 1958 data) that the middle-class whites had the highest aspirations and the lower-class Negroes' aspirations were similar to those of the lower-class whites. He explained that the difference in environment (a large city in one study and the small, almost rural city in the other study) was the reason for the variance in the results of these studies. He emphasized the degree of stability of the middle-class white families in the large city and the degree of instability of the Negro and lower-class families in this area. He added that the Negro ethnic group was used as a negative reference group.

Henderson and the Ausubels (Henderson 1966, 1967; Ausubel and Ausubel 1963) have several ideas to offer about the dilemma of the Negro youth with high aspirations. These authors have written reviews of the literature on levels of aspiration and articles about education and the socially disadvantaged. Henderson asked his school children about

their vocational aspirations. He found that a large majority of the Negro children had little knowledge of the training involved in their voiced occupation or any knowledge of closely related occupations. Henderson says that the poverty stricken Negro, no matter what his pattern of adjustment, has been tempted to disavow all that is "Negro." For the Negro child the level of aspiration is contingent upon his frame of reference. "There are lower-income Negro students who maintain a high or low level of aspirations depending upon their social class conditioning" (1967, p. 43). Henderson believes that since lower-level Negro youth have high potentials of failure and the resulting ego involvement, they will display "atypical" aspirations for school achievement. "Levels of aspiration under stressful conditions become defense mechanisms" (1967, p. 43). Henderson also mentions the implications that the vocation which the Negro children voice in school is their ideal vocation, not their real aspiration.

There are many investigators who report that the Negro does not have high aspirations. The previous studies mentioned have investigated vocational aspirations. The present studies involve academic aspirations. Wylie (1963) found that Negroes and lower-class children make more modest estimations of their ability to do school work than the white and higher-class students. These students were 7th, 8th, and 9th graders. Goff (1954) studied both 6-8 and 12-14 year olds in upper and lower income groups. She found no significant differences in levels of confidence voiced by the 6-8 year old lower and upper income boys. The older upper income boys expressed greater aspiration in relation to school subjects than comparable lower income groups. She

concluded that the Negro and lower-income boys learned of their inferiority at school. As they advanced in the grades their confidence declined.

In summary, the literature which compares Negro and white upper and lower class populations seems to be of two kinds and presents two different sets of results. The literature on vocational studies indicates that the Negro youth have relatively high aspirations, often similar to and higher than the lower-class white's aspirations. The issue of whether this high level of vocational aspirations is ideal or real has been raised. The literature on school achievement and ability indicates that the Negro child learns about his restrictions and as he grows older he makes more modest estimations of his school ability. He comes to school without experiencing school failure. As he continues in school he loses his confidence.

There is little variance in the results of studies dealing with lower-class and middle-class whites. The socially disadvantaged children are found to be less highly motivated to have lower aspirations for academic achievement than are their middle-class and upper-class peers (Sewell, Haller, Straus-1957; Hieronymus 1951). High levels of aspiration and positive attitudes toward school were also shown to be more frequent in middle-class and upper-class children than in lower socio-economic groups. Sewell et al. also found that educational aspirations tended to be greatly influenced by class values in favor of the middle and upper classes.

On the basis of research presented, the general purposes of this study are to investigate:

1. Third grade boys' performance on Kagan's Matching Familiar Figures test and the relationship, if any, of this performance to socio-economic level and ethnic groups.
2. The level of aspiration of the boys and the relationship of aspiration, if any, to socio-economic level and ethnic background.

The hypotheses are:

1. Anglo-Americans will be more reflective than Mexican-Americans, and Mexican-Americans in turn will be more reflective than Negroes on the Kagan Matching Familiar Figures test.
2. On the same test the middle class will be more reflective than the lower class.
3. The middle-class Anglo children will have the highest aspirations. The middle-class Mexican-American, the middle-class Negro children, and the lower-class Anglo children will have similar and lower aspirations. The lower-class Mexican-American and Negro children will have the lowest aspirations.

The Rosenblatt study indicates that the Anglo groups are more reflective than the Mexican-American groups. It is expected that the present study will support the Rosenblatt findings. It is also expected that the more impulsive Mexican lower class, combined with the Mexican middle class, will place the Mexican group in a more impulsive position when it is compared to the Anglo group.

The Negro group presents a problem since there have been no studies relating their ethnic and social variables to cognitive impulsivity. It is expected from the various studies of the socially disadvantaged children that the Negro group will have difficulty on a test of perceptual

discrimination and will respond even less adequately than the lower class Mexican-American group in the Rosenblatt study. The Negroes are a minority group as are the Mexican-Americans. Social discrimination has also prevented the middle-class Negro from enjoying the advantages which are available to the middle-class Anglo children. The weight of the minority group discrimination of the Negro and his socially disadvantaged status influence the expectation that the Negro group will be more impulsive.

The expectation of the distinction between the social classes in the direction of a more reflective middle class and a more impulsive lower class within each ethnic group is also influenced by the Rosenblatt data and the literature on the socially and educationally disadvantaged.

The third hypothesis is related to level of aspiration. The cognitive test used in this study is more closely related to the studies of academic aspirations than to the studies of vocational aspiration. The academic aspiration literature (and to some extent the vocational literature) indicates that the upper-income white children have the highest aspiration. The minority groups generally have lower aspiration than the middle-class Anglos. The Anglo lower class also has lower expectations than the middle class (Anotonovsky 1967 and Goff 1954). The combination of minority group and lower social class status is therefore expected to influence aspiration in a downward direction. The lower-class Mexican-Americans and Negroes are expected to have the lowest aspirations.

METHOD

Subjects

The subjects for this study were 134 third grade boys enrolled in 18 elementary schools in Tucson's School District One. They were selected on the basis of ethnic background and socio-economic status. An attempt was made to include only those boys whose parents were both living and whose father was living in the home. All the subjects were born in the United States. The Anglo group consisted of boys of non-Mexican, non-Negro, or non-oriental parentage. The Mexican-American ethnic group included boys whose father or grandfathers were of Mexican descent. Last names were used as the criterion. These boys were all second or third generation Mexican-American.

The socio-economic status criterion used was occupation, as classified by Hollingshead and Redlich (1958). The father's occupation was used for this classification since information about income and educational level and location of the home was not available. Middle-class occupations included: independent businessmen, managers, skilled workers, salesmen, teachers, and service men. Lower-class occupations included: unskilled and semiskilled workers such as repairmen, miners, janitors, gardeners, and the unemployed and odd-job workers.

The six groups of boys included: 25 middle-class Anglo-Americans, 25 lower-class Anglo-Americans, 25 middle-class Mexican-Americans, 25 lower-class Mexican-Americans, 9 middle-class Negroes, and 25 lower-class Negroes.

Although the subjects were all third graders, their ages varied as follows:

<u>Group</u>	<u>Range</u> <u>years - months</u>		<u>Mean</u> <u>years - months</u>
Anglo middle class	8-5	9-6	8-11
Anglo lower class	8-5	10-4	9-1
Mexican-American middle class	8-8	10-3	9-4
Mexican-American lower class	8-3	10-6	9-1
Negro middle class (9)	8-4	10-1	9-2
Negro lower class	8-5	10-9	9-1

Instrument

The Matching Familiar Figures Test (developed by Kagan) was used. Kagan has developed several different tests to investigate cognitive impulsivity. He suggested that this test was the more preferred one. The MFF tests consist of two examples and twelve items (see Appendix C). For each item there is a standard picture and six choices of figures similar to the standard. The child is asked to select one of the six pictures that looks just like the standard figure. Both the standard and choices are presented at the same time. These characteristics fulfill the requirements that the task be one in which the alternatives are presented simultaneously and it is not immediately obvious which alternative is correct.

Measurements are recorded for each item. The child is timed from the time of exposure to the standard figure to the time of his first response. Each choice the child gives until he chooses the correct figure is recorded. The total number of errors made by each child is then

calculated. Dependent variables include: (1) reaction time or latency of response and (2) number of errors made.

According to Kagan, the impulsive child is one who will have a rapid reaction time and will make more errors than the reflective child who will take longer, consider the alternatives, and make fewer errors.

Measurements of aspiration and achievement were also recorded. The aspiration index was the number of times the child thought he could point to the correct figure on the first try. The achievement index was the actual number of correct first responses the child made. These measurements will be discussed at greater length below.

Procedure

Each boy was seen individually during school hours. The testing rooms varied from nurses' offices to the reading specialist's room. Care was taken to have the children sit in the position in which they would be subjected to the least amount of distraction. The testing time was short, from ten to fifteen minutes, so attention was held throughout the period. Before the test began there was a brief discussion. The boys were asked their age, how they liked school and their father's occupation. When there was any doubt or the child could not answer the specific questions, the school records were consulted. The boys were then given the following instructions as specified by Kagan:

"I am going to show you a picture of something you know and then some pictures that look like it. You will have to point to the picture on this bottom page (points) that is just like this one on the top page (point). Let's do some for practice." The practice items are

shown to the boy and he is helped to find the correct answer.

If he is successful with both examples he is praised with, "good, you got them both on the first try." No child in this study had to be helped twice so each child was praised for pointing to the correct picture on the first try. The boy is then told that he will be shown 12 more pictures that are a little bit harder. The child is asked how many of these 12 he thinks he can pick out correctly on the first try as he has just done, even though the pictures are a bit harder. His response is recorded as his aspiration level. If he is reluctant to answer or if he says he does not know, he is encouraged by suggestions which cover numbers from 1 to 12.

The MFF test was then continued. "Now we are going to do some that are a little bit harder. You will see a picture on top and six pictures on the bottom. Find the one that is just like the one on the top and point to it."

A record was made of the latency to the first response to the half second, the total number of errors for each time, and the order in which the errors were made. If the subject was correct he was praised; if wrong, he is told, "no, that is not the right one." And sometimes the instructions were repeated, "point to the one that looks just like the one on the top."

The test is in booklet form and the booklet was placed on a stand so both the stimulus figure and the alternative figures were clearly visible to the subject at the same time.

The boys were told to keep the session a secret. Not more than nine and usually only two to four boys were taken from one classroom.

Since most of the testing of a classroom took place in one day, there was little chance that responses were contaminated by previous knowledge of the test items.

RESULTS

The measures of impulsivity and reflectivity in this study include the number of errors a child makes on the Matching Familiar Figures test and his response latency on this test. Response latency is the amount of time it takes the child from the initial exposure to the item to give his first response to each item of the test. For each child the total number of errors he made and the total response time he took for the twelve items were calculated. Then the average errors and latency for the group were calculated. These two measures can be studied individually, or they can be studied as a combined criterion of cognitive impulsivity. The present author has investigated the measures both individually and as a double criterion of impulsivity.

Kagan has described the impulsive child as the child who responds quickly and makes many errors. The reflective child has a slower response latency and makes fewer errors. The more valid criterion for cognitively impulsivity is the combination of the two measures. This part of the results will be presented shortly.

An analysis of variance using Winer's unweighted mean formula was calculated for the two independent variables of ethnic group and socio-economic level for the following dependent variables: average response latency, number of errors, level of aspiration, achievement, and the discrepancy between aspiration and achievement. This information is presented in Appendix B.

The data of the present study, both individual and the combined criterion, will be discussed in relationship to the results of the Rosenblatt study (1968). It should be recalled that the Rosenblatt subjects were first grade boys with an age range of six years to six years, nine months. The present subjects are third grade boys with an age range from eight years to ten and one-half years. In regard to the Rosenblatt ethnic and socio-economic groups, the present study will consider: the Mexican-American middle and lower class Catholic, public school children, the Anglo-American lower class Protestant public school children; and for the purposes of comparison, the Anglo middle class Protestant public school and the Anglo middle class parochial school children will be combined. Rosenblatt studied children in parochial schools as well as those in public schools. The present study investigates only public school children and includes Negro subjects.

Combined Criterion for Cognitive Impulsivity

When the combined criterion for cognitive impulsivity is used, the subjects are divided into two groups, "impulsive" and "reflective." The "impulsive subjects are those who have a short response latency (below the median of the entire group) and a high error score (at or above the median for the entire group). The "reflective" subjects are those who have a long response latency (at or above the median) and a low error score (below the median). The subjects who did not fit into the impulsive and reflective categories were eliminated. Table 1 presents the frequency and percent within each ethnic-class group of reflective and impulsive subjects on the MFF test for the present study.

TABLE 1
 NUMBER AND PERCENT WITHIN EACH ETHNIC-CLASS GROUP OF REFLECTIVE
 AND IMPULSIVE SUBJECTS IN THE SIX GROUPS ON THE MFF TEST

	Group 1 Anglo- American Middle Class	Group 2 Anglo- American Low Class	Group 3 Mexican- American Middle Class	Group 4 Mexican- American Low Class	Group 5 Negro Middle Class (N=9)	Group 6 Negro Low Class	N
Impulsive*							
number of S	5	7	7	10	5	14	48
percent	20	24	24	40	55	56	
Reflective**							
number of S	15	10	9	7	3	5	49
percent	60	40	36	24	33	20	
Below Median on both measures							
number	2	4	6	6	0	1	19
percent	8	16	25	25	0	4	
Above Median on both measures							
number	3	4	3	2	1	5	18
percent	12	16	12	8	11	20	
N	25	25	25	25	9	25	134

*Subjects are at or above the median for average number of errors and below the median for latency of response.

**Subjects are at or below the median for number of errors and below the median for latency of response.

Table 2 presents the percent of reflective and impulsive subjects within each class-ethnic group in both the present study (Carrillo) and the Rosenblatt study. Table 2 also gives the number of subjects in the class-ethnic groups who are in the impulsive and reflective categories for the Rosenblatt study. Rosenblatt used a χ^2 with a Yates correction to find that her Mexican-American lower class was significantly more impulsive than each of the three other groups: the Anglo middle and lower classes and the Mexican-American middle class.

In the present study (Table 1) there were 48 boys in the impulsive category, 49 boys in the reflective category, and 37 boys who were not in either category. Visual inspection of the frequencies of the subjects within each ethnic-class group in each of the categories indicates a continuum from impulsive to reflective. On the impulsive end of the continuum are the Negro lower class and the Negro middle class. The Mexican-American lower class and the Mexican-American middle class are the middle groups. The Anglo lower class and the Anglo middle class are on the reflective end of the continuum.

Several χ^2 's were computed with the data from this study, using the Yates correction. Each class ethnic group was compared with each of the other groups (not presented in the tables). The only significant ratio is the ratio between the Anglo middle class and the Negro lower class. The Anglo middle class boys are significantly more reflective than the Negro lower-class boys ($\chi^2 = 6.72, p < .01$).

The frequencies of the members in the six class-ethnic groups were combined in two ways. One contingency table consists of middle and lower classes (Table 3A). The χ^2 ratio between the socio-economic

TABLE 2

PERCENT WITHIN EACH ETHNIC-CLASS GROUP OF REFLECTIVE AND IMPULSIVE
SUBJECTS ON THE MFF TEST IN CARRILLO AND ROSENBLATT STUDIES

	Group I Anglo- American Middle Class	Group II Anglo- American Lower Class	Group III Mexican- American Middle Class	Group IV Mexican- American Lower Class	Group V Negro Middle Class	Group VI Negro Lower Class
Rosenblatt	15	35	24	76		
IMPULSIVE						
Carrillo	20	24	24	40	55	56
Rosenblatt	44	29	59	00		
REFLECTIVE						
Carrillo	60	40	36	24	33	20

TABLE 3

χ^2 COMPARISONS OF ETHNIC AND SOCIAL CLASS GROUPS
ON THE REFLECTION-IMPULSIVITY VARIABLE FOR
THE CARRILLO STUDIES

A

Carrillo
(Anglo, Mexican-American, Negro)

SOCIAL CLASS

Middle Lower

Impulsive

17	31
----	----

Reflective

27	22
----	----

($\chi^2 = 3.791$ $p < .06$)

B

Carrillo

ETHNIC GROUP

Anglo Mexican Negro

Impulsive

12	17	19
----	----	----

Reflective

25	16	8
----	----	---

($\chi^2 = 9.354$ $p < .025$)

TABLE 4

χ^2 COMPARISONS OF COMBINED ETHNIC AND SOCIAL CLASS
GROUPS ON THE REFLECTION-IMPULSIVITY VARIABLE
FOR THE CARRILLO AND ROSENBLATT STUDIES

A

Carrillo Combined Ethnic-class Groups

	Anglo Middle	Anglo Lower	Mexican Middle	Mexican Lower
Impulsive	5	7	7	10
Reflective	15	10	9	7

$$(\chi^2 = 2.256 \quad p < .50)$$

B

Rosenblatt Combined Ethnic-class Groups

	Anglo Middle	Anglo Lower	Mexican Middle	Mexican Lower
Impulsive	5	6	4	13
Reflective	15	5	10	0

$$(\chi^2 = 18.444 \quad p < .001)$$

classes is at the 6 percent probability level. The contingency table for the ethnic groups, Anglo, Mexican-American, and Negro, is also presented in Table 3B. The χ^2 ratio between ethnic groups was significant ($\chi^2 = 9.354, p < .025$). Inspection of the Carrillo study contingency Tables 3A and 3B indicates that both the class variable and the ethnic background are important variables in the cognitive dimension of impulsivity. The lower class tends to be more impulsive and the middle class more reflective. The Negro groups tend to be more impulsive, the Anglo groups tend to be more reflective, and the Mexican-Americans tend to be the middle group. The latter differences (ethnic background) are clearer than the class differences.

Tables 3 and 4 present several ways of combining the data from the Carrillo study (Table 1) and the Rosenblatt study. It should be recalled the Carrillo data are only the data from the Anglo and Mexican-American groups. They do not include the data from the Negro groups. This is why the above results from the present study alone should be distinguished from the results obtained by combining the data from the two studies.

The results of the combined Carrillo and Rosenblatt data are:

1. A χ^2 was computed for the contingency tables of Carrillo Combined Ethnic-class Groups and Rosenblatt Combined Ethnic-class Groups (Table 4A and 4B). The Carrillo χ^2 was not significant. The Rosenblatt χ^2 was significant beyond the probability of .001 ($\chi^2 = 18.444$). The two χ^2 's were combined (Siegel 1956, p. 64). The results were significant with a probability less than .01 with 6 degrees of freedom ($\chi^2 = 20.700$).

TABLE 5

χ^2 COMPARISONS OF ETHNIC AND SOCIAL CLASS GROUPS
ON THE REFLECTION-IMPULSIVITY VARIABLE FOR
THE CARRILLO AND ROSENBLATT STUDIES

		A		B	
		Carrillo		Rosenblatt	
		ETHNIC GROUP		ETHNIC GROUP	
		Anglo	Mexican	Anglo	Mexican
Impulsive		12	17	11	17
Reflective		25	16	20	10
		$(\chi^2 = 2.624 \text{ p} < .11)$		$(\chi^2 = 3.332 \text{ p} < .075)$	
		C		D	
		Carrillo (Anglo - Mexican)		Rosenblatt (Anglo - Mexican)	
		CLASS STATUS		CLASS STATUS	
		Middle	Lower	Middle	Lower
Impulsive		12	17	9	19
Reflective		24	17	25	5
		$(\chi^2 = 2.000 \text{ p} < .16)$		$(\chi^2 = 15.645 \text{ p} < .001)$	

This χ^2 is the "over-all" combined ratio.

2. The ethnic group and social class variables were separated and computed. The Carrillo Mexican-American and Anglo ethnic-group data were not significant. The Rosenblatt ethnic-group data were also not significant. The combined χ^2 for the ethnic groups was also not significant (Table 5A and 5B).
3. The social class χ^2 distributions were computed. The Carrillo class data were not significant. The Rosenblatt class data were significant ($\chi^2 = 15.645$, $p < .001$). The combined χ^2 was also significant ($\chi^2 = 17.656$, $p < .001$, with 2 degrees of freedom) (Table 5C and 5D).

In summary, when the frequency data for the two studies are combined through combined χ^2 , the trends which are evident in the Carrillo study become significant. The "over-all" combined χ^2 indicates there is some difference among the class-ethnic groups. This difference is accounted for when the combined socio-economic χ^2 indicates that socio-economic class makes a difference. The lower-class children are more impulsive and the middle-class children are more reflective. The combined χ^2 of the ethnic groups was not significant.

The significance of the data from the Carrillo study change as they are combined with the Rosenblatt data. When the Negro subjects are included there is a greater distinction between the ethnic groups on the "reflection-impulsivity" dimension than the distinction between the social classes on this dimension. When the Negroes are eliminated and the data are combined with the Rosenblatt data, there is a greater

distinction made between the classes in favor of the middle class as the more reflective group. So it can be said that both ethnic background and social class status make a difference, the significance of the difference changes as function of the specific comparison groups used.

Level of Aspiration

The children in this study were asked how many of the 12 picture items they thought they could point to correctly on the first try. This number (1 to 12) was the index of aspiration. The number of items which the children responded to correctly on the first try was their achievement. This score also ranged from 1 to 12. The difference between the aspiration and achievement scores was computed to form a discrepancy score. A low discrepancy score would indicate greater success in attempting to attain the aspired level of correctness. A high discrepancy score indicates a failure to reach the aspired level of correctness.

Table 6 (in Appendix A) presents the means of the aspiration, achievement and discrepancy measures for the six class-ethnic groups. The results of the analysis of variance for class and ethnic variables on these measures are presented in Table 7. Inspection of the table indicates that for the ethnic variable a significant F ratio was obtained in the discrepancy score between aspiration and achievement on the Matching Familiar Figures test. For the class variable there were no significant F's obtained.

All interactions were not significant with the exception of the interaction ratio for the discrepancy measure. The meaning of this latter difference may be explicated by inspection of Figure 1. The figure

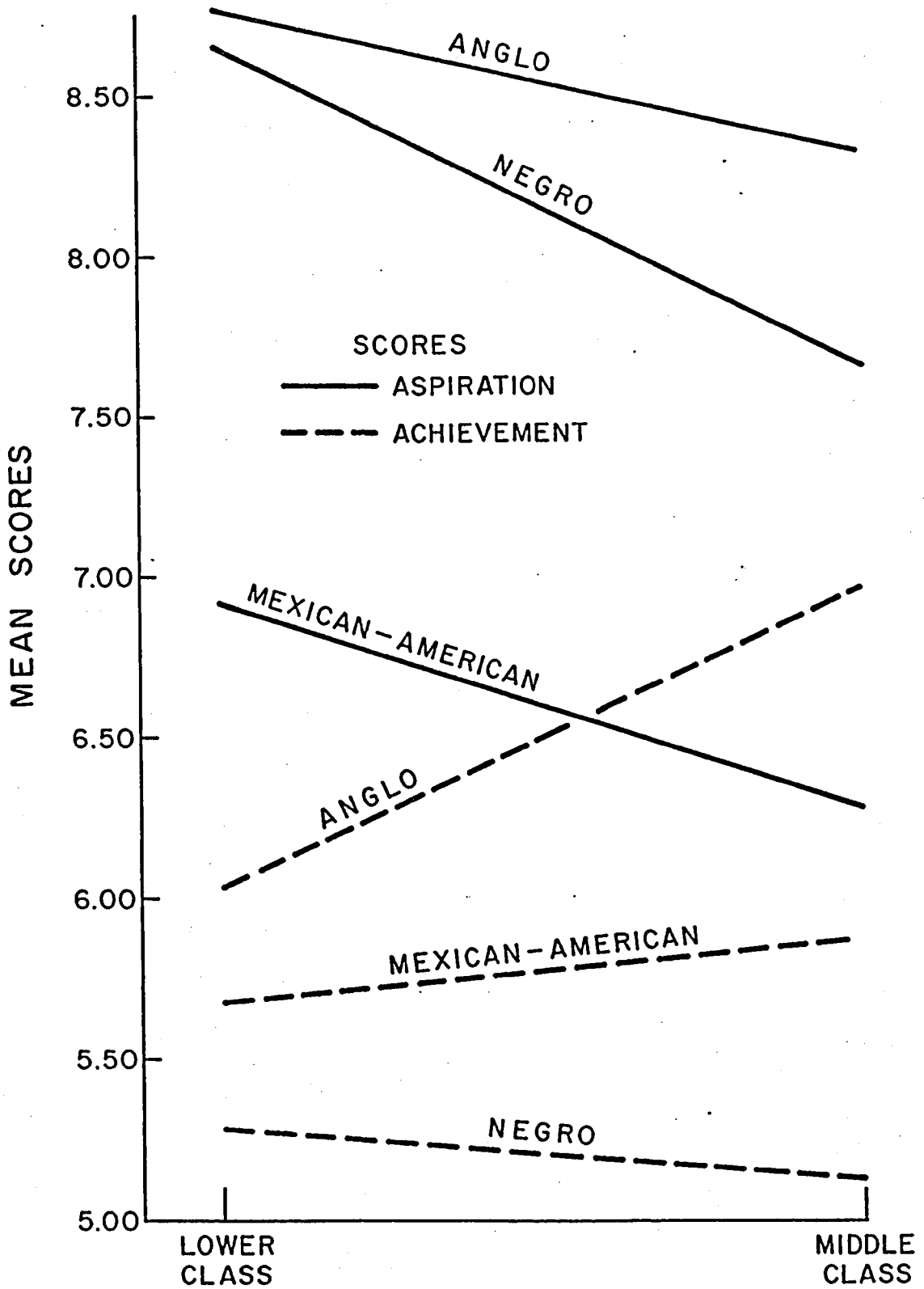


Figure 1. Mean aspiration scores and mean achievement scores for each class-ethnic group. for

indicates that the difference on the discrepancy score between the lower and middle-class Anglo groups is much greater than the same difference for the Mexican-American group. The Negro difference approximates that of the Mexican-American group.

The trend for the level of aspiration (Table 6, Appendix A) reflects some of the findings of the Negro aspiration studies mentioned previously. The lower classes have a higher aspiration than the middle classes. It is possible that this reflects an unrealistic aspiration. It also seemed, during the individual testing, that some of the children were saying "all of them" in order to avoid the difficulty of making a more definitive decision. Others were rigid in their response. Their comments, "all twelve," reflected an "I don't care" attitude.

The achievement scores were lower than the aspiration score for each group. This may reflect the children's expectation that the test items would be as easy as the examples were. A consideration of the alternative hypothesis that the items would be harder (as was mentioned during the session) would have lowered the levels of expectation and decreased the discrepancy scores.

Figures 1 and 2 may help clarify the relationships discussed. Both aspiration and achievement are represented on Figure 2. The levels of aspiration are generally much higher than the levels of achievement. In every case the lower class has a higher aspiration than its respective ethnic middle class. The achievement scores of the middle class were generally higher than the scores of the lower class. Figure 2 presents the discrepancy scores (aspiration minus achievement). The high scores indicate that the children were not successful in trying to attain their

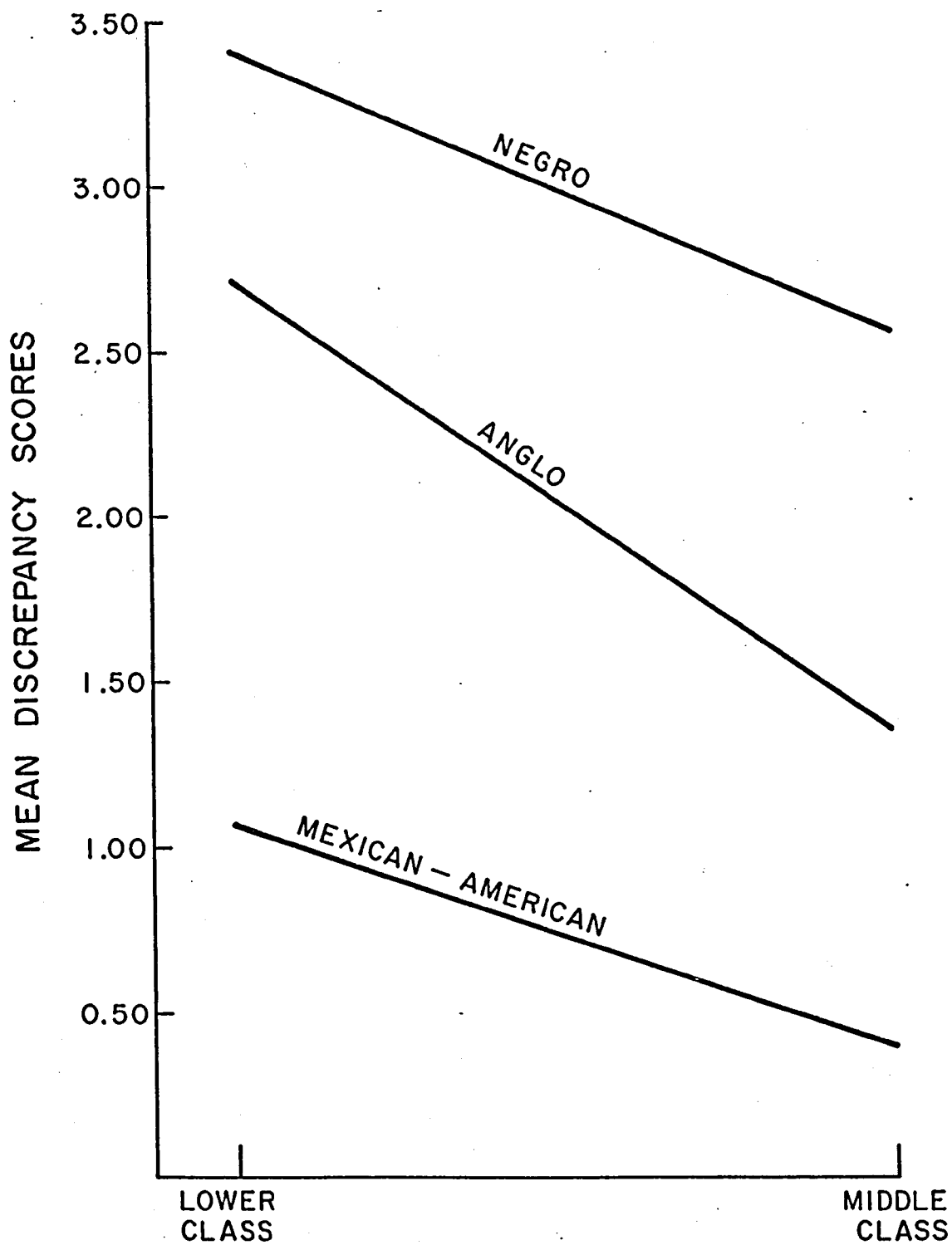


Figure 2. Mean discrepancy scores between aspiration and achievement for each class-ethnic group.

level of aspiration. The Mexican-American middle-class boys came the closest to their aspiration. The Negro lower-class boys were furthest away. The Mexican-American middle-class group was more realistic or more conservative. The Negro group was less realistic. Within each ethnic group, the middle classes came closer to their aspirations than did the lower classes. At the same time the middle classes had more conservative aspiration than did the lower classes (Figure 2).

In summary the lower-class children had higher aspirations than the middle-class children. Negroes and Anglos had higher aspirations than the Mexican-Americans. The achievement scores from high to low were: Anglo, Mexican-American, and Negro. The highest discrepancy scores were in the Negro groups. The Anglo groups had lower discrepancy scores, and the Mexican-American groups had the lowest discrepancy scores. The six class-ethnic groups are ranked according to the above variables. This rank order of groups is presented in Table 8 in Appendix A.

Correlation between Results and Hypotheses

1. As expected, Anglo-Americans are more reflective than Mexican-Americans, and Mexican-Americans in turn are more reflective than Negroes on the Kagan Matching Familiar Figures test.
2. On the same test, the middle class tends to be more reflective than the lower class. These hypotheses are confirmed.
3. It was expected that the middle-class Anglo children would have the highest aspirations. The lowest aspirations were expected to be associated with the Mexican-American and Negro

lower classes. The other ethnic-class groups were expected to be the middle groups. Almost the opposite was true. The lower-class Anglo and Negro children had the highest aspirations. The middle-class Anglo and Negro children had the next highest aspirations. The Mexican-American children had the lowest aspirations. There were no significant differences found among the children on this variable. This hypothesis is not supported.

SUMMARY AND CONCLUSIONS

The most important measures of the "reflection-impulsivity" dimension are the combined measures of high response latency, low errors, and low response latency, high errors. These combined measures have been referred to as the "reflective" category and the "impulsive" category. This discussion will focus upon the relationships of these categories with ethnic and social class variables.

The results of a comparison of the frequencies of middle and lower-class subjects in the impulsive and reflective categories indicates a trend in the direction of class as an important variable in the cognitive dimension. The middle classes tend to be more "reflective" and the lower classes tend to be more "impulsive."

A comparison between the number of subjects of each of the three ethnic groups in the two categories resulted in a significant χ^2 ratio. It is concluded that the Anglo groups are more reflective and the Negro groups are more impulsive. The Mexican-American children are the middle groups. Both ethnic background and social class status are important variables in cognitive impulsivity. The discrimination between the ethnic variable is more distinct than the discrimination between the class variable.

When only the Anglo and Mexican-American groups in this study are considered, there is a class difference and an ethnic difference which only approach significance (class $p = .16$; ethnic $p < .11$)

The presence of the Negro children produces the major significance in the data.

The Mexican-American and Anglo data do indicate an important trend. The Mexican-American lower class tends to be more impulsive than the other three groups. The importance of this trend is magnified by the results of the Rosenblatt study. In her study the Mexican-American lower class was significantly more impulsive than the other three groups. When the Anglo and Mexican-American data from the Carrillo and Rosenblatt studies are combined the trends in the former study become significant. Thus social class and ethnic variables are both important determinants of cognitive impulsivity. There is a clearer distinction between the class variable in the direction of a more impulsive lower class than there is between the ethnic variable in the direction of a more impulsive Mexican-American class.

A question may be raised about the Anglos and Mexican-Americans. If social class is of significant importance, why is this not even more apparent in the Carrillo study? More specifically, why are there fewer third grade Mexican-American lower-class boys in the impulsive category than there were in the first grade? Why are there more of these third graders in the reflective category than there were first graders?

A visual comparison of the contingency tables labeled Carrillo and Rosenblatt which include all four ethnic class groups (Table 4A and 4B) suggests that the greater differences in frequencies are between the Anglo lower class and the Mexican-American lower class. The greatest difference may also be in the reflective category. There are more Mexican lower-class children in the reflective category in the third grade

study than there are in the first grade study (Rosenblatt). It would seem, then, that while the lower class is becoming somewhat less impulsive in two years of education, a greater difference is reflected in more lower-class children becoming reflective.

The Mexican-American lower-class child appears to be the clearest example of a tendency toward change. He seems to have become more reflective after two years of school. This group of children has the lowest average latency of response (Table 7, Appendix B), so in that respect it is more impulsive than the other groups. These boys have also made fewer errors than their first grade counterparts. They have achieved almost as well as the lower-class Anglos and the middle-class Mexican-Americans. It may be speculated then that the lower-class child, in particular the Mexican-American lower-class child, has learned to make fewer errors and thereby has become more reflective. As a first grader he brought few problem-solving skills from home. He seems to have learned more strategies which he can apply to cognitive tasks. He may also have learned the values of success and failure because he has had more school experience than the first grade children.

There is some indication that the lower-class child has learned to consider the alternative solution hypotheses before making his decisions on problem-solving tasks. The middle-class child was more reflective than the lower-class child when he came to school. By the third grade this position has not changed, but the gap between the reflective middle class and impulsive lower class seems to be smaller.

It might be interesting to investigate this speculation using the longitudinal method. The children could be tested in the first grade

in the beginning of the year and again in the third grade. Kagan has made longitudinal studies of children over a period of two years, but there are no investigations of the differences in cognitive impulsivity of the child just before he enters school and that child in the third grade.

The Negro groups are an important part of this study. They represent a significant addition to the research on the "impulsivity-reflectivity" dimension. At present there are no first grade groups to compare to the Negro. The Negro children present a different situation since they seem to have less fear of failure. The investigator observed that when the Anglo child made errors he was often visibly disturbed. In contrast, the Negro child, when he made an error, did not give any indication of concern. The Negro groups made the most errors and had the lowest achievement. Yet the Negro groups responded as quickly as the Mexican-American groups. This fast response may reflect anxiety caused by the testing situation.

The Negroes were different from the Mexican-Americans and Anglos in another way. The Negro children were the only subjects who would point to any figure on the MFF test without hesitation and ask "Is it this one?" The directions were repeated, and they would continue to ask while pointing randomly "Is it this?" "This one?" "This?" This action may reflect a feeling of external control which Battle and Rotter (1963) investigated. They found that the lower-class Negroes were more "external" in relation to their feelings of personal control than middle-class Anglos and Negroes, who were more "internal."

Ethnic background and social class status variables tend to influence cognitive impulsivity in children. The Hess and Shipman study

(1965) and the Deutsch studies (1963, 1965) among others indicate that the middle-class home environment is different from the lower-class environment in several ways. The middle-class mothers are more verbal than the lower-class mothers. They often have had more education and are able to express themselves more elaborately. They have more time and patience to explain their environment to their children. The lower-class mother is often busy away from the home and has less time to spend with her children. She has difficulty expressing herself and may have less patience for explaining things. The middle-class mother perceives more alternatives in her environment and gives her children choices. The lower-class mothers tend to be more demanding and to have a more restricted view of their children's abilities.

The physical environment of the homes are also different. The Anglo middle-class family is generally considered to have the most enriched environment. Minority groups such as the Mexican-American and Negro tend to have a more sparse environment than the Anglo, and the lower classes have a more depressed environment than the middle classes. The sparse environment of the depressed areas inhibits the development of perceptual abilities and of strategies for attacking cognitive problem-solving situations (Deutsch 1963, 1965).

The reflective child has parents who offer alternatives and who have the patience to allow the child the time to consider the alternatives. The variety of experience this child has also enhances his ability to perceive nuances in his environment. The impulsive child generally has not had these advantages. His parents have not had as many opportunities in life as the middle-class parents, and they are not aware of the many

alternatives. They also tend to do the decision making for the child. They are more authoritarian.

It appears that membership in certain minority groups and in a lower socio-economic class are factors which inhibit the development of reflective thinking. It is not just culture which influences cognitive style, it is culture in addition to social class standing. In some ethnic groups, the ethnic factors present in the environment tend to intensify the lower-class factors which make for poorer thinking.

The Anglo group middle-class group have more of the advantages which enhance the development of reflective thinking. The Anglo low-class and Mexican-American and Negro middle-class groups each have a handicap. It might be said that the discrimination against the Negro is greater than that against the lower-class whites. The Negro's handicap may be a more detrimental one. The Mexican-American and Negro lower classes have two "social points" against them. Both the ethnic background and social economic forces prohibit their development of reflective thinking.

The issue of the role intelligence plays in cognitive impulsivity raises the question of the possibility that the results presented might be primarily a function of cognitive ability rather than of cognitive style. There has been research (Kagan 1965a; Kagan et al. 1963; Kagan et al. 1964) which has correlated subtests of the Wechsler Intelligence Scale for Children. This research indicates that intelligence is only mildly related to scores on the Matching Familiar Figures test.

The measure of level of aspiration in this study leaves much to be desired. It is possible that the high aspirations obtained were

based upon the children's successful completion of the two simple examples on the MFF test. The consideration of an alternative hypothesis that the test items would be more difficult than the examples (as was the verbal warning given to each child) would have lowered the levels of aspiration.

It might be interesting, if this study were replicated, to tell the children after they had completed the test that they would have another chance to take it. Then, one could ask them how many items they think they can point to correctly on the first try. It would be interesting to see how their success or failure on the items affects their aspiration.

It would also be interesting to study the "reflection-impulsivity" characteristics of the Negro first grade children of both socio-economic levels to see if they are more like the Anglo or the Mexican-American middle or lower class when they first come to school.

More research is needed in the area of evaluating the preschool and early school child. Measures are needed which reflect important variables such as values, experiences and other ideas the child brings to school from home so these sources can be built upon at school. It is also important to have some knowledge of the child's mode of learning. Does he give answers without thinking or does he take longer and give a well thought out answer?

Kagan's measure has advantages over verbal tests, but it has the disadvantage of being an individual's test. If it is administered to a group, the response latency is eliminated. Yet a critical analysis of the errors made by the children would make even a group administration an

important source of knowledge for the teacher. The greatest challenge in the field of impulsivity and reflectivity may be the development of special tasks and skills which would be a part of the school training. This training would enhance the reflective abilities of school children in tasks such as reading, where the ability to consider alternatives is important.

APPENDIX A

ANALYSIS OF VARIANCE

ANALYSIS OF VARIANCE

In this section the analysis of variance of the two measures of impulsivity will be presented. These measures are the number of errors a child makes on the MFF test and his response latency during the test. In review, the number of errors is the number of times the child points to an incorrect figure on the test. (Total possible errors is 60.)

Response latency is the time (in seconds) the child takes from initial exposure to each item until his first response to that item.

Table 6 presents the means of the measures of impulsivity, the levels of aspiration, achievement, and the discrepancy scores for the six ethnic-class groups. The results of the analysis of variance for ethnic and class variables on these measures are presented in Table 7. Inspection of the table indicates that for the ethnic variable a significant F ratio was obtained in the MFF test number of errors, and the MFF Latency. For the class variable, there were no significant F's obtained. There were also no significant interactions for the measures of errors and response latency.

The Rosenblatt data on the MFF test are included in Table 6. A comparison of these data with the measures of the present study show that the trends of the means of errors for each group fall in a similar pattern. Rosenblatt found that the Mexican-American lower class was significantly more "impulsive" than the other three groups in her study on the errors measure. In the present study the only significant difference found among the Anglos and Mexican-Americans is that the Mexican-

TABLE 6
 MEANS OF COGNITIVE MEASURES OF IMPULSIVITY, LEVEL OF ASPIRATION,
 ACHIEVEMENT AND THE DISCREPANCY SCORES FOR THE SIX GROUPS

	Group 1 Anglo- American Middle Class	Group 2 Anglo- American Lower Class	Group 3 Mexican- American Middle Class	Group 4 Mexican- American Lower Class	Group 5 Negro Middle Class	Group 6 Negro Lower Class
Carrillo MFF number of errors	8.08	10.20	10.00	12.25	13.00	13.56
Rosenblatt MFF number of errors	18.94	23.24	20.18	28.00		
Carrillo MFF response latency	249.32	200.00	174.14	152.60	172.90	160.26
Rosenblatt MFF response latency	34.59	66.00	51.27			
Level of aspiration	8.32	8.76	6.28	6.92	7.67	8.65
Achievement	6.96	6.04	5.88	5.68	5.11	5.28
Discrepancy v. aspiration achievement	1.36	2.72	0.40	1.08	2.56	3.40

TABLE 7
ANALYSIS OF VARIANCE AMONG CLASS AND ETHNIC GROUPS

	F Number of Errors	F Response Latency	F Aspiration	F Achievement	F Discrepancy Aspiration - Achievement
Between Class Variance	2.816	2.644	.948	,169	2.148
Between Ethnic group Variance	5.983**	4.554*	2.742	1.999	3.939*
Interaction	.618	.930	.108	1.810	10.058***

* Significant at the 5 percent level of confidence (2, 128 degrees of freedom).

** Significant at the 1 percent level of confidence (2, 128 degrees of freedom).

*** Significant at the .1 percent level of confidence (2, 128 degrees of freedom).

American lower class is more "impulsive" (made more errors) than the Anglo middle class ($t = 2.06, p < .025$). In addition, in the present study, the Negro lower class is more "impulsive" (made more errors) than both groups of Anglo children and the middle-class Mexican children. (Mexican-American middle class and Negro lower class: $t = 2.41, p < .01$). There are no other significant relationships within the measures of the number of errors made on the MFF test. In summary, the Anglo middle class is the most "reflective" group and the Negro lower class is the most "impulsive" group. The other ethnic-class groups have a position on the continuum within these two points.

A visual comparison of the mean MFF number of errors made by the children in the Rosenblatt study with the mean errors made by the children in the present study, and a similar comparison of the average response latencies of the two studies, confirms Kagan's (1965) observations that as children grow older they tend to become more reflective. The older children (Carrillo study) have made fewer errors and have taken a longer time to respond than the younger children.

The children in the Rosenblatt study were not significantly different from each other in response latency (Table 6). In the present study inspection of the analysis of variance on Table 7 indicates that there are ethnic differences on the response latency measure. A t-distribution was computed between several of the groups and the following relationships were found: the Anglo middle children took longer to respond than the Mexican-American middle class ($t = 2.232, p < .05$), longer than the Mexican-American lower class ($t = 2.990, p < .01$), and longer than the Negro lower class ($t = 2.627, p < .02$); the Anglo lower class took

longer to respond than the Mexican-American lower class ($t = 2.251$, $p < .05$). The Anglo middle, and to some extent the Anglo lower class are more "reflective" in reference to the response latency measure. The Mexican-American lower class is the most "impulsive" in this regard.

Figures 3 and 4 may help clarify the relationships discussed. Figure 3 presents the distribution of the means of the number of errors made by each ethnic-class group. Inspection of this figure indicates that there is a distinction between ethnic groups. The Anglo groups made the least number of errors. The Negro groups made the most errors. Within each ethnic group, the lower class made more errors than the middle class.

Figure 3 also presents a comparison of the Rosenblatt study with the Carrillo study on the number of errors measure. The Rosenblatt lower-class Mexican-American children had made significantly more errors than the middle-class Mexican-American and Anglo children. This distinction is reduced at the third grade level (Carrillo study). This figure may help to clarify the issue of third grade and first grade changes in the direction of the third grader becoming more reflective. This issue has been discussed in the summary and conclusions.

Figure 4 presents the distribution of the means of the response latency for each group. The distinction between the groups is not as clear as it was in the previous figure. The Anglo boys delayed longest before making their responses. The Mexican-American and Negro children had similar response latencies.

Each of the six groups of boys has been ranged according to its scores on the five individual measures dealt with in this study (errors,

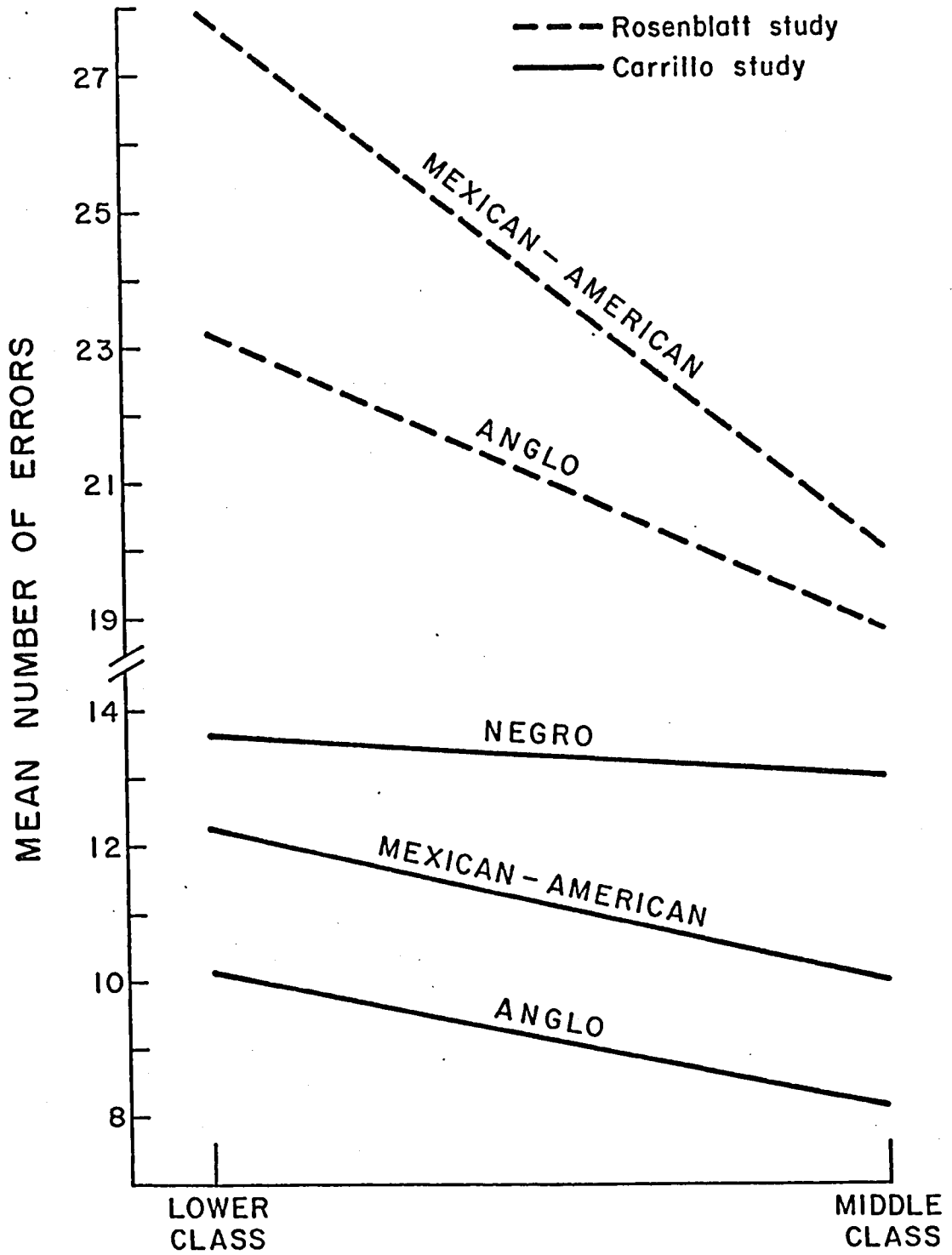


Figure 3. Mean number of errors made on the MFF test by each class-ethnic group in the Carrillo and Rosenblatt studies.

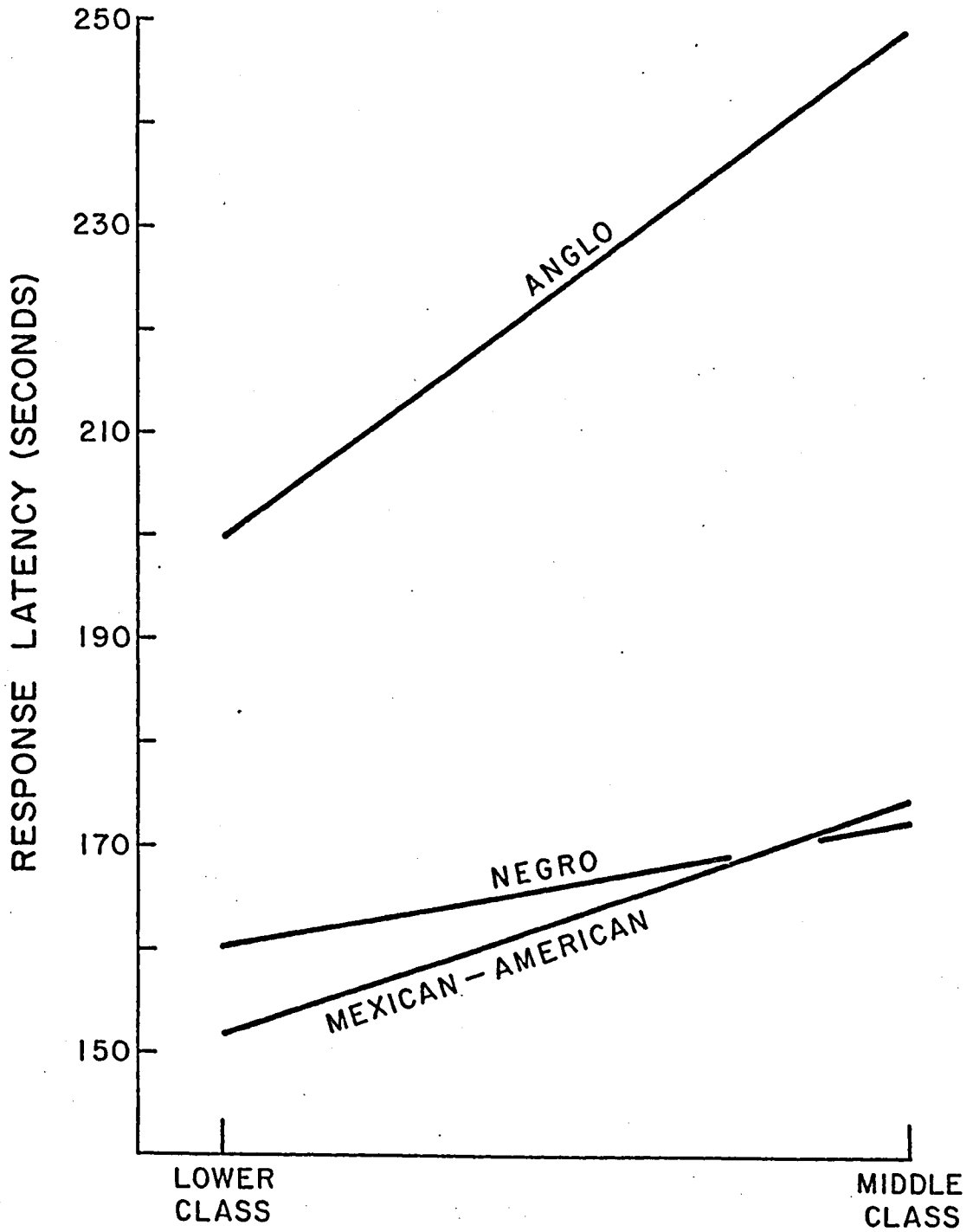


Figure 4. Mean response latencies on the MFF test for each class-ethnic group in the Carrillo study.

latency, aspiration, achievement, and discrepancy). The ranks of the groups are presented in Table 8. Inspection of this table indicates an interesting relationship between the level of aspiration and the discrepancy score. The higher the aspiration, the higher the discrepancy score. It seems that the higher the aspiration of a group, the further they were from their goal. It is quite possible that the method used to obtain the level of aspiration was deceiving and inaccurate.

The analysis of variance of the individual measures, the number of errors and the response latency indicates that the distinction between ethnic background on the cognitive impulsivity dimension is somewhat clearer than the distinction between the socio-economic variable. The results indicated by the combined criterion (in the text) are again confirmed by an analysis of the individual measures.

TABLE 8
 RANK ORDER OF SIX GROUPS OF SUBJECTS ON MFF MEASURES,
 LEVEL OF ASPIRATION, ACHIEVEMENT, AND DISCREPANCY

Rank	MFF Number of Errors Few - Most	MFF Response Latency Long - Short	Level of Aspiration High - Low	Level of Achievement High - Low	Discrepancy Aspiration minus Achievement High - Low
1	Anglo- American Middle class	Anglo- American Middle class	Anglo- American Lower class	Anglo- American Middle class	Negro Lower class
2	Mexican- American Middle class	Anglo- American Lower class	Negro Lower class	Anglo- American Lower class	Anglo- American Lower class
3	Anglo- American Lower class	Mexican- American Middle class	Anglo- American Middle class	Mexican- American Middle class	Negro Middle class
4	Mexican- American Lower class	Negro Middle class	Negro Middle class	Mexican- American Lower class	Anglo- American Middle class
5	Negro Middle class	Negro Lower class	Mexican- American Lower class	Negro Lower class	Mexican American Lower class
6	Negro Lower class	Mexican- American Lower class	Mexican- American Middle class	Negro Middle class	Mexican- American Middle class

APPENDIX B

THE DATA

TABLE 9
 DATA FOR MEXICAN-AMERICAN MIDDLE-CLASS SUBJECTS

(Total) Response Latency (seconds)	(Total) Errors	Aspiration	Achievement
116.8	11	6	5
296.7	13	6	4
106.8	8	9	6
68.4	11	12	7
269.2	5	12	9
207.5	3	6	9
207.9	5	3	7
89.7	14	5	3
108.6	15	10	5
92.7	10	2	6
77.9	14	6	4
125.8	18	2	2
289.8	7	9	7
157.6	6	6	7
262.9	9	9	5
106.6	10	6	5
176.4	7	6	7
184.9	18	3	4
135.6	9	9	7
190.1	6	8	8
162.1	13	3	6
226.7	17	5	3
327.1	6	6	7
200.2	5	6	9
120.5	10	2	5

TABLE 10

DATA FOR MEXICAN-AMERICAN LOWER-CLASS SUBJECTS

(Total) Response Latency (seconds)	(Total) Errors	Aspiration	Achievement
200.0	6	8	6
171.1	5	4	7
86.3	26	10	1
126.1	9	6	7
133.8	15	5	5
122.1	9	12	6
214.6	19	2	3
127.2	18	2	3
112.1	13	8	4
150.2	10	10	7
83.8	19	12	3
135.5	18	6	7
99.4	7	6	9
139.3	13	9	7
57.7	20	6	4
160.4	12	10	4
196.7	9	10	8
102.5	14	6	3
114.8	18	6	4
177.9	23	10	2
184.7	8	3	8
210.8	5	5	7
105.2	6	2	7
339.2	4	5	9
272.3	8	9	8

TABLE 11

DATA FOR ANGLO-AMERICAN MIDDLE-CLASS SUBJECTS

(Total) Response Latency (seconds)	(Total) Errors	Aspiration	Achievement
383.2	2	12	10
822.7	1	10	11
75.4	15	12	4
163.7	12	6	5
352.9	4	10	9
369.3	1	12	11
214.0	6	4	8
316.3	5	5	9
126.8	5	10	8
253.7	8	12	7
261.6	16	6	4
253.0	4	12	9
218.5	4	12	9
155.8	5	9	8
124.4	13	6	5
179.5	10	6	6
162.5	8	5	7
129.2	16	10	3
155.8	13	5	3
349.8	7	6	6
348.2	7	10	7
172.9	18	8	4
283.5	5	6	8
233.6	5	9	9
126.8	12	5	4

TABLE 12
 DATA FOR ANGLO-AMERICAN LOWER-CLASS SUBJECTS

(Total) Response Latency (seconds)	(Total) Errors	Aspiration	Achievement
101.9	12	6	4
183.9	15	5	6
542.1	4	12	10
224.0	6	12	6
280.3	14	4	5
154.1	15	9	5
219.7	4	12	9
157.9	19	8	3
176.0	9	10	6
260.8	7	12	7
126.2	19	6	3
144.7	8	8	6
138.5	12	12	7
245.1	10	12	4
133.1	13	10	4
163.3	13	7	6
117.0	7	6	7
126.8	15	8	5
269.8	6	8	7
195.3	3	12	9
298.8	12	3	6
179.4	8	12	6
190.9	4	12	9
133.3	13	12	4
116.8	7	2	7

TABLE 13
DATA FOR NEGRO MIDDLE-CLASS SUBJECTS

(Total) Response Latency (seconds)	(Total) Errors	Aspiration	Achievement
176.0	17	4	5
106.2	26	8	1
133.9	16	12	4
379.9	6	8	8
79.9	12	3	4
78.9	13	12	5
101.0	11	6	6
297.1	7	4	7
203.2	9	12	6

TABLE 14
DATA FOR NEGRO LOWER-CLASS SUBJECTS

(Total) Response Latency (seconds)	(Total) Errors	Aspiration	Achievement
90.9	19	12	2
117.7	15	12	5
105.8	13	9	4
88.4	12	6	4
162.3	16	12	4
75.4	15	4	5
145.2	24	2	2
161.0	13	3	6
369.2	3	12	10
129.3	16	12	5
179.1	14	10	3
34.7	26	12	1
213.2	8	5	7
212.1	11	12	7
95.8	15	10	5
216.0	13	12	6
143.3	16	4	5
352.3	4	12	9
179.4	11	12	5
82.4	10	12	7
111.3	21	1	3
254.4	2	12	11
176.9	8	8	8
102.4	13	8	4
208.0	21	4	4

APPENDIX C

THE MATCHING FAMILIAR FIGURES TEST*

* Kagan's format is slightly revised for convenience in handling.

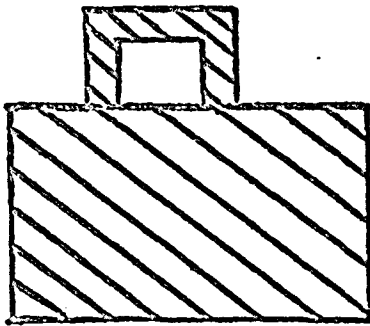
Kagan 9/29/65

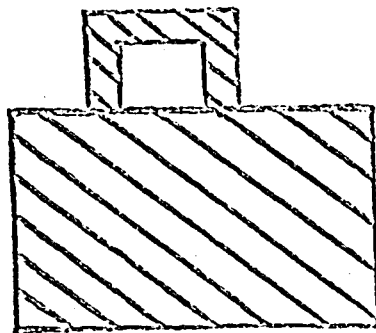
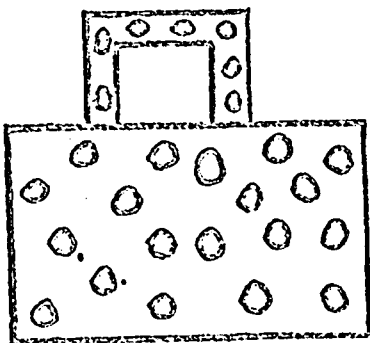
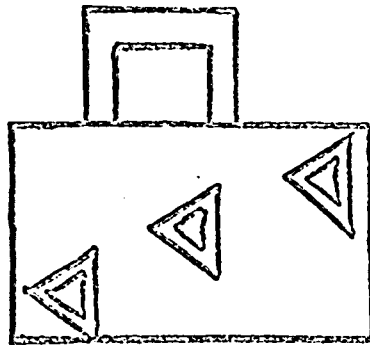
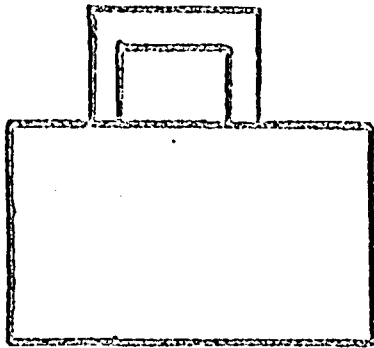
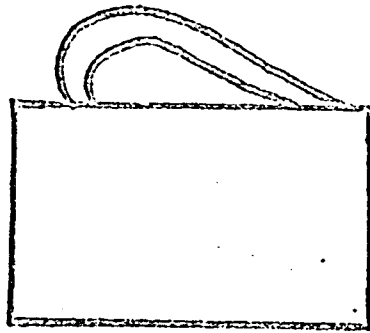
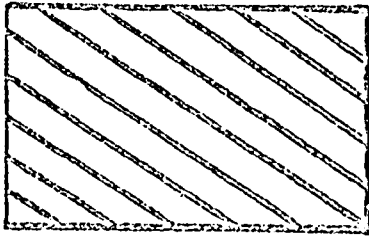
MATCHING FAMILIAR FIGURES

Answer Sheet

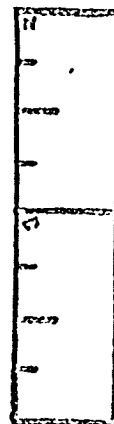
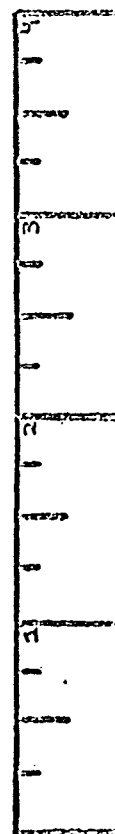
Set 1-F

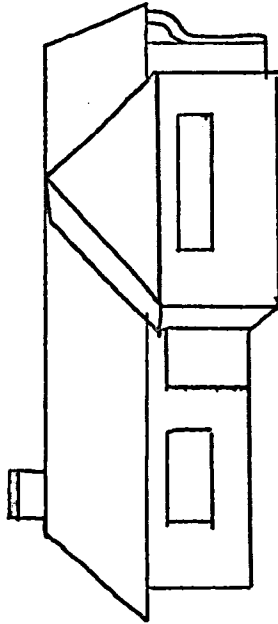
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	2. scissors 6
	3. phone 3
	4. bear 1
	5. tree 2
	6. leaf 6
	7. cat 3
	8. dress 5
	9. giraffe 4
	10. lamp 5
	11. boat 2
	12. cowboy 4

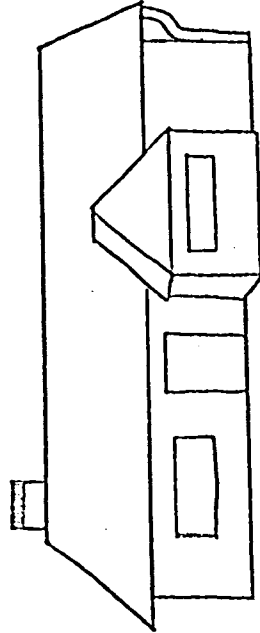
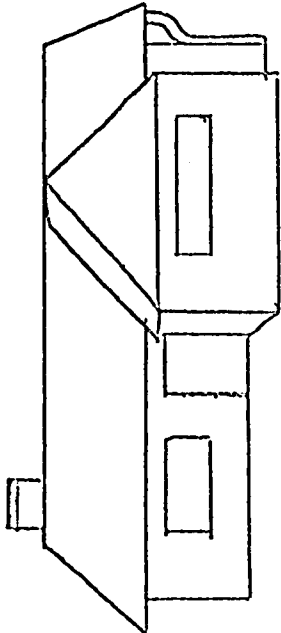
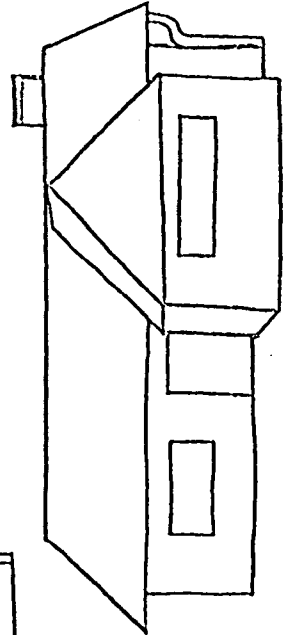
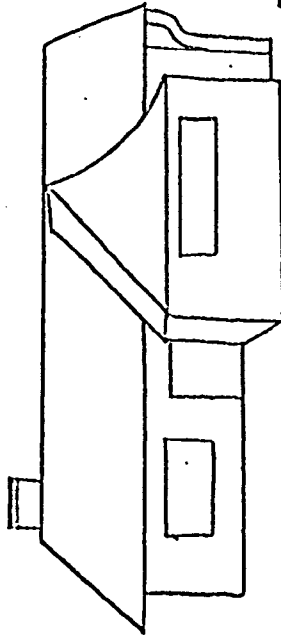
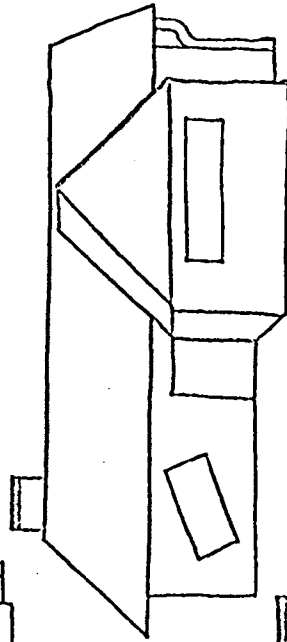
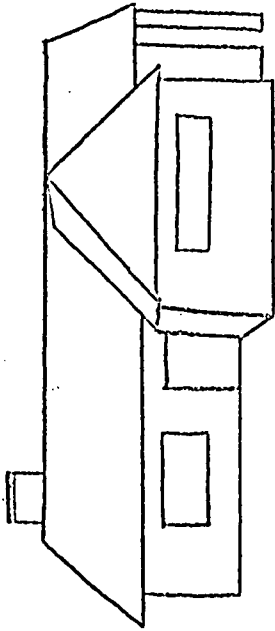


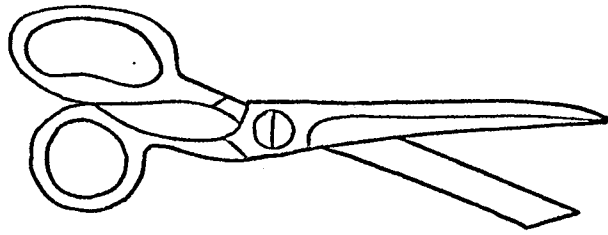


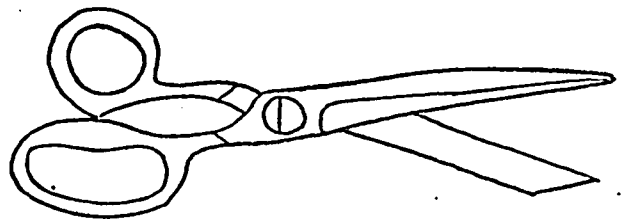
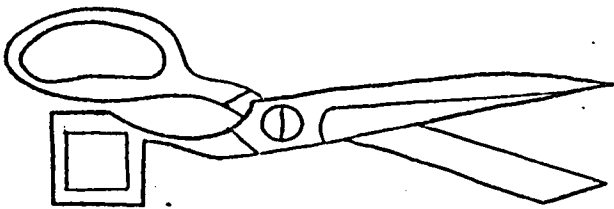
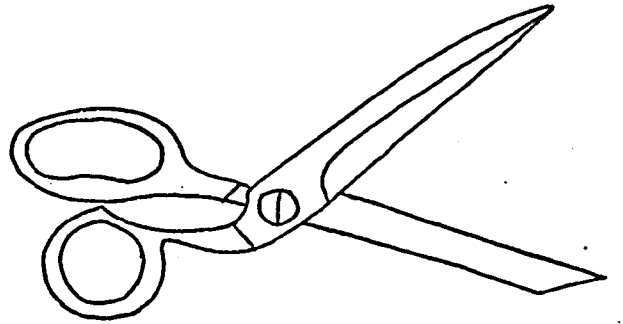
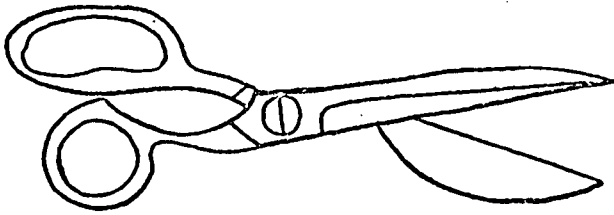
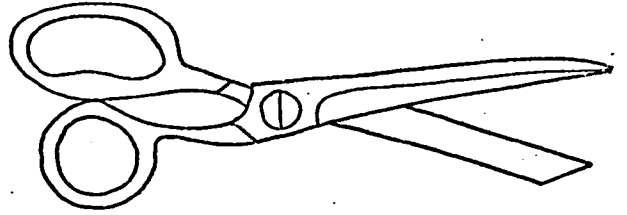
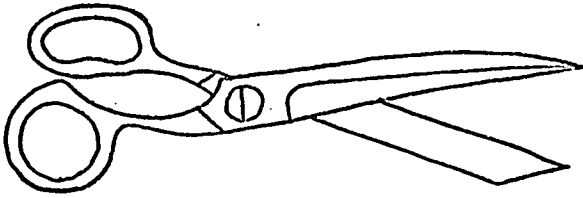


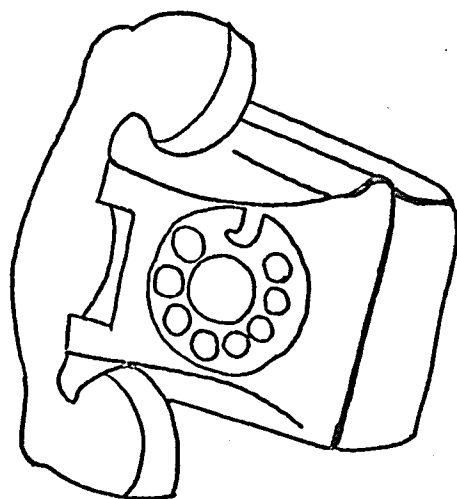


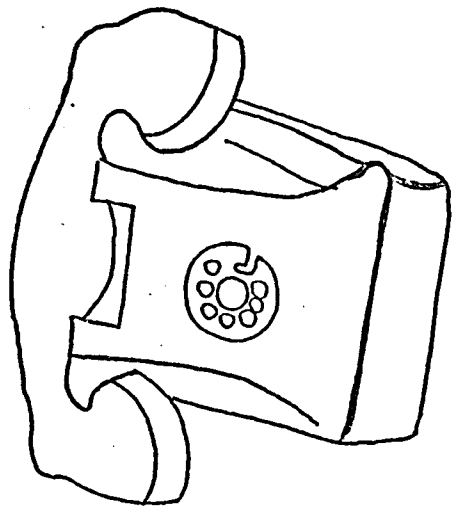
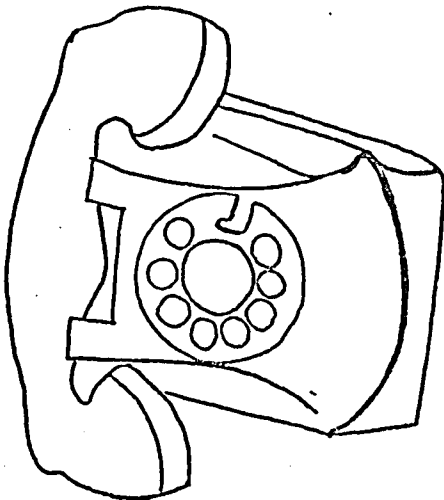
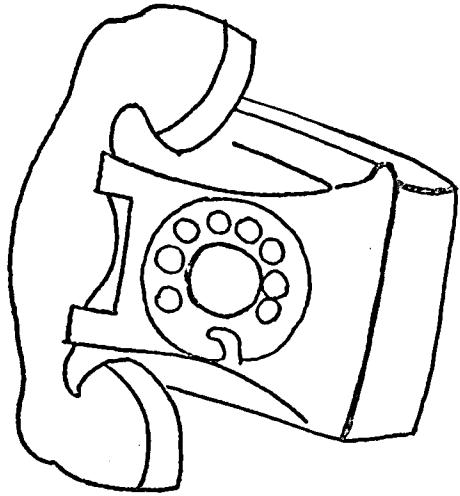
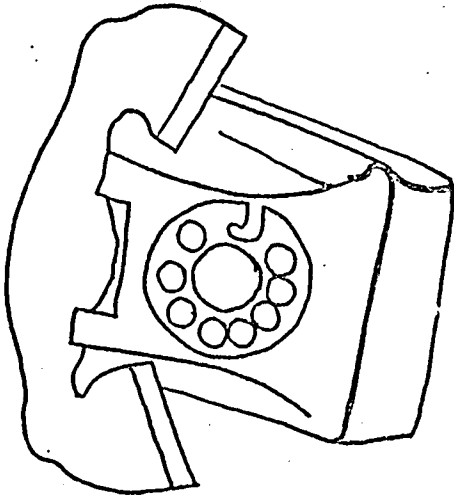
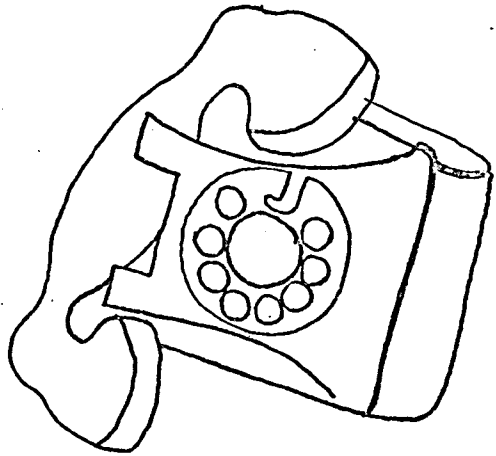
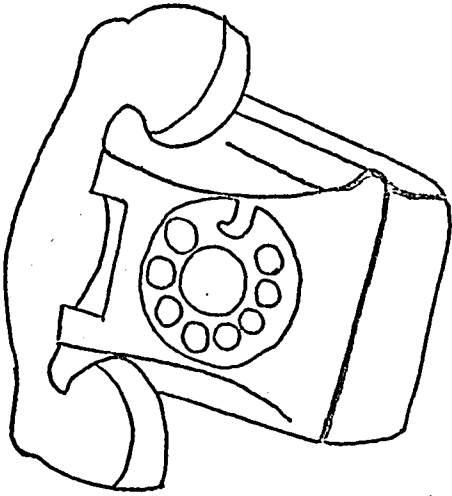


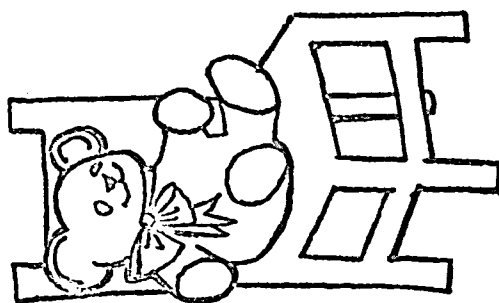


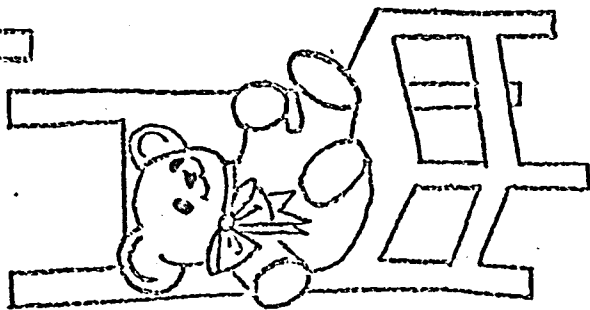
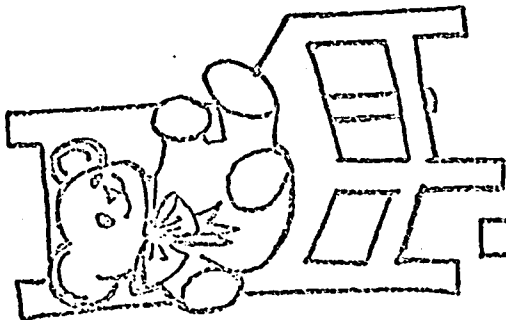
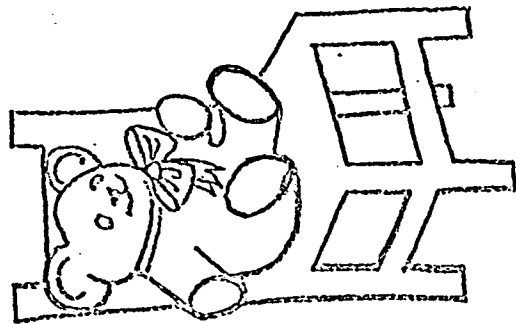
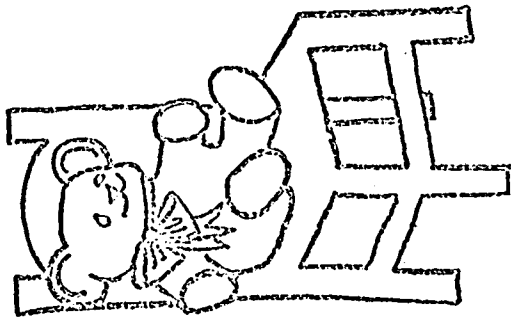
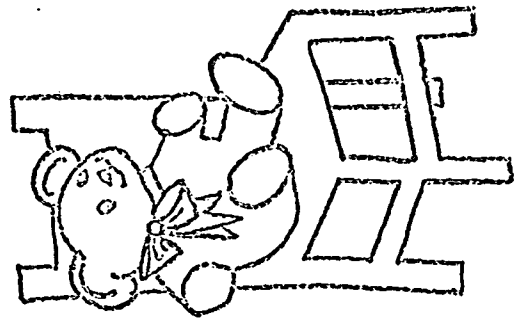


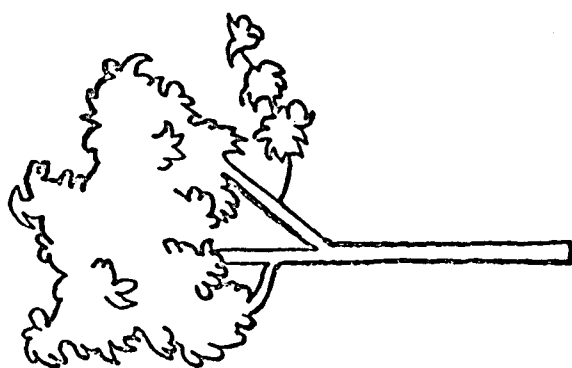


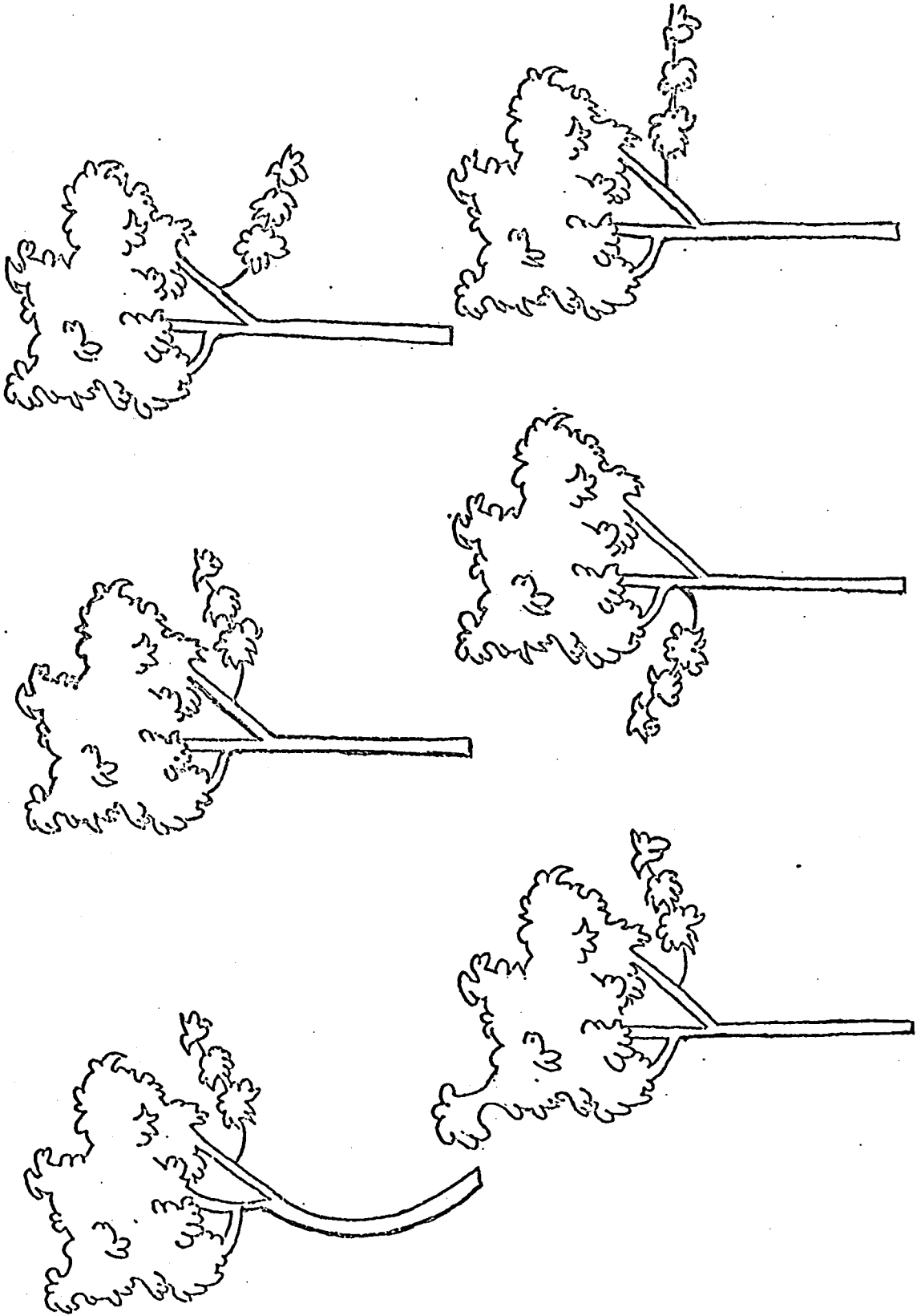


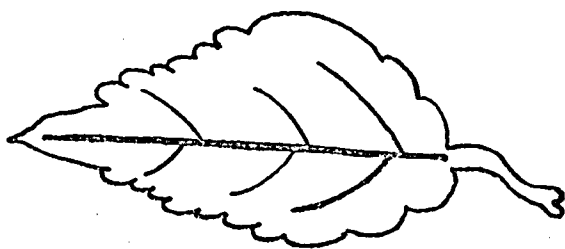


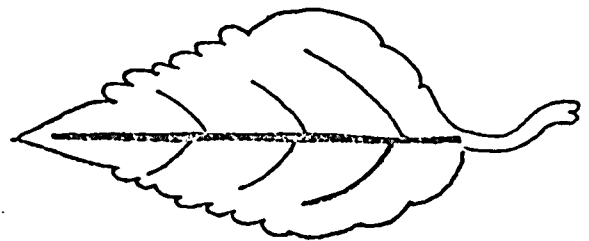
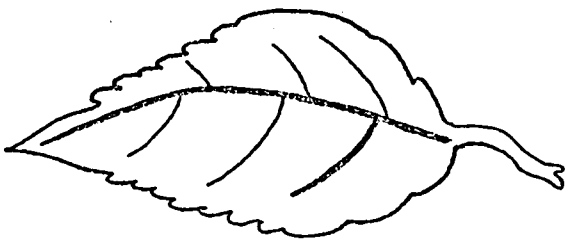
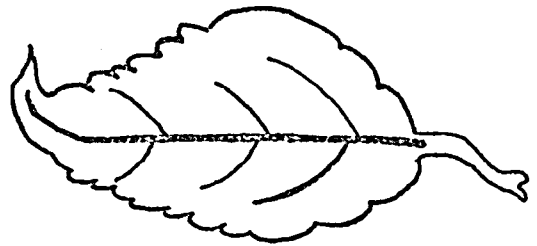
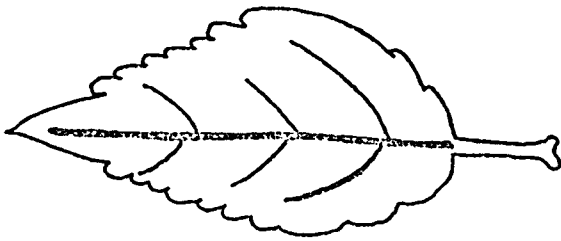
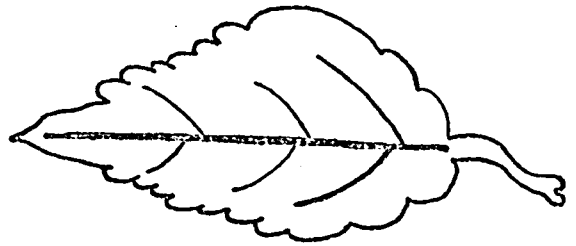
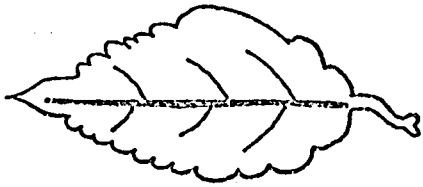


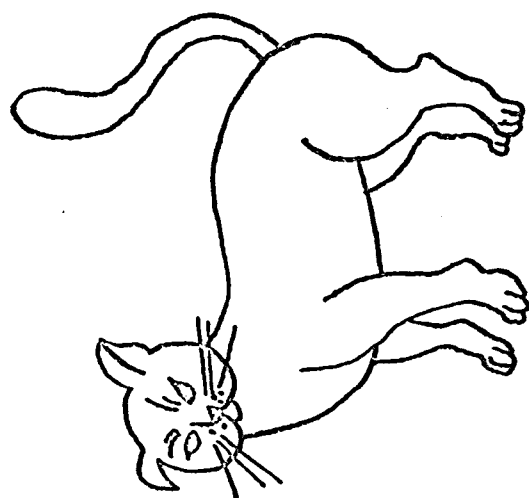


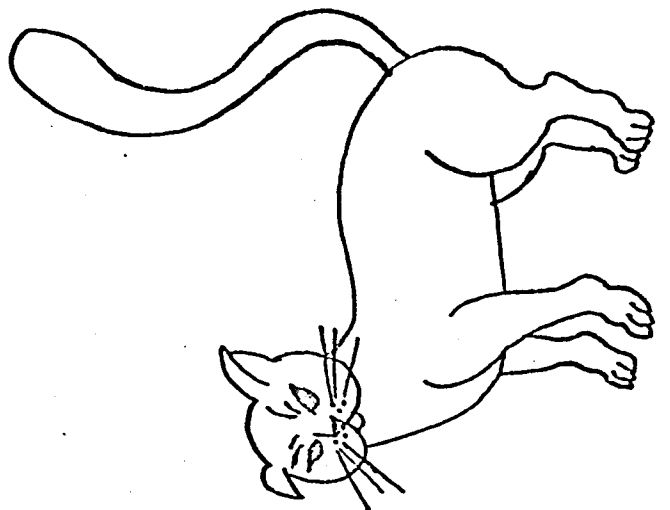
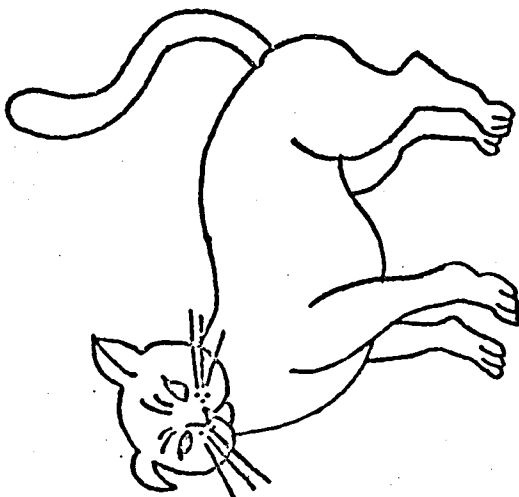
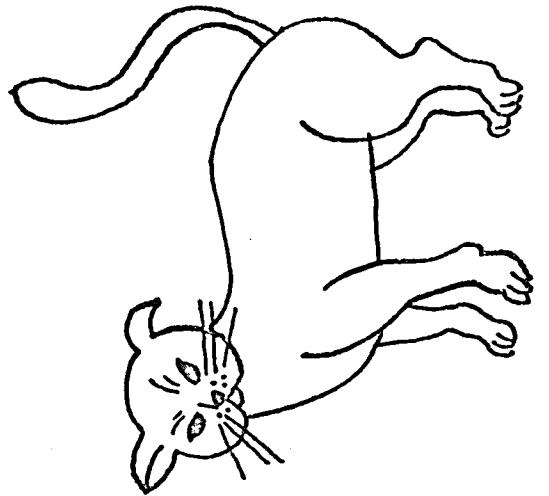
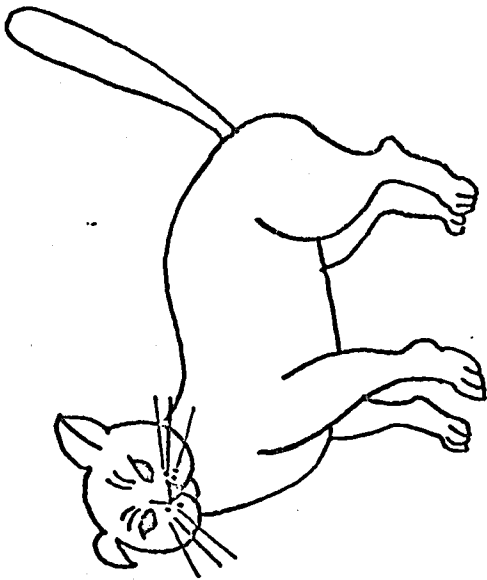
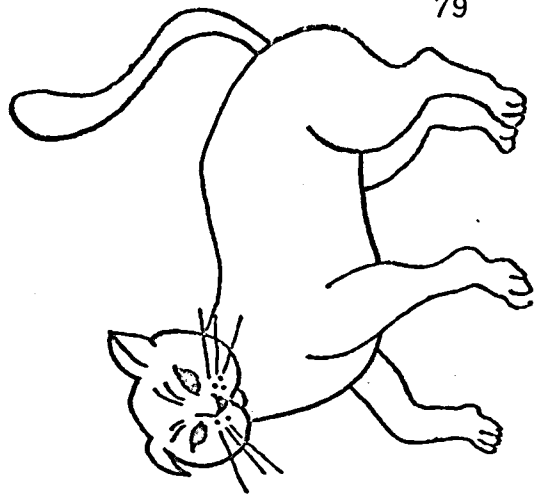
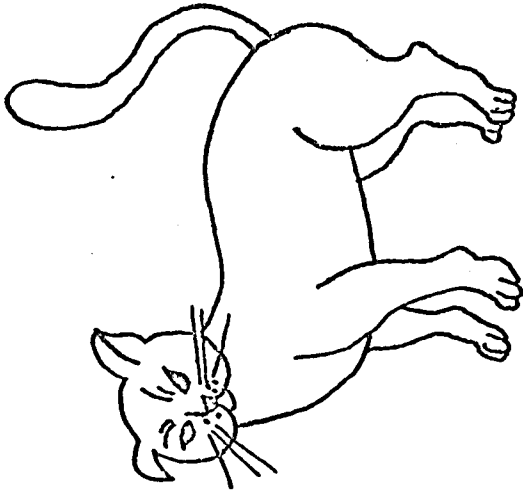


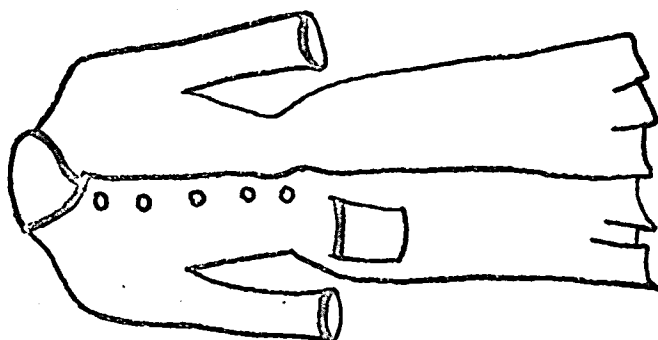


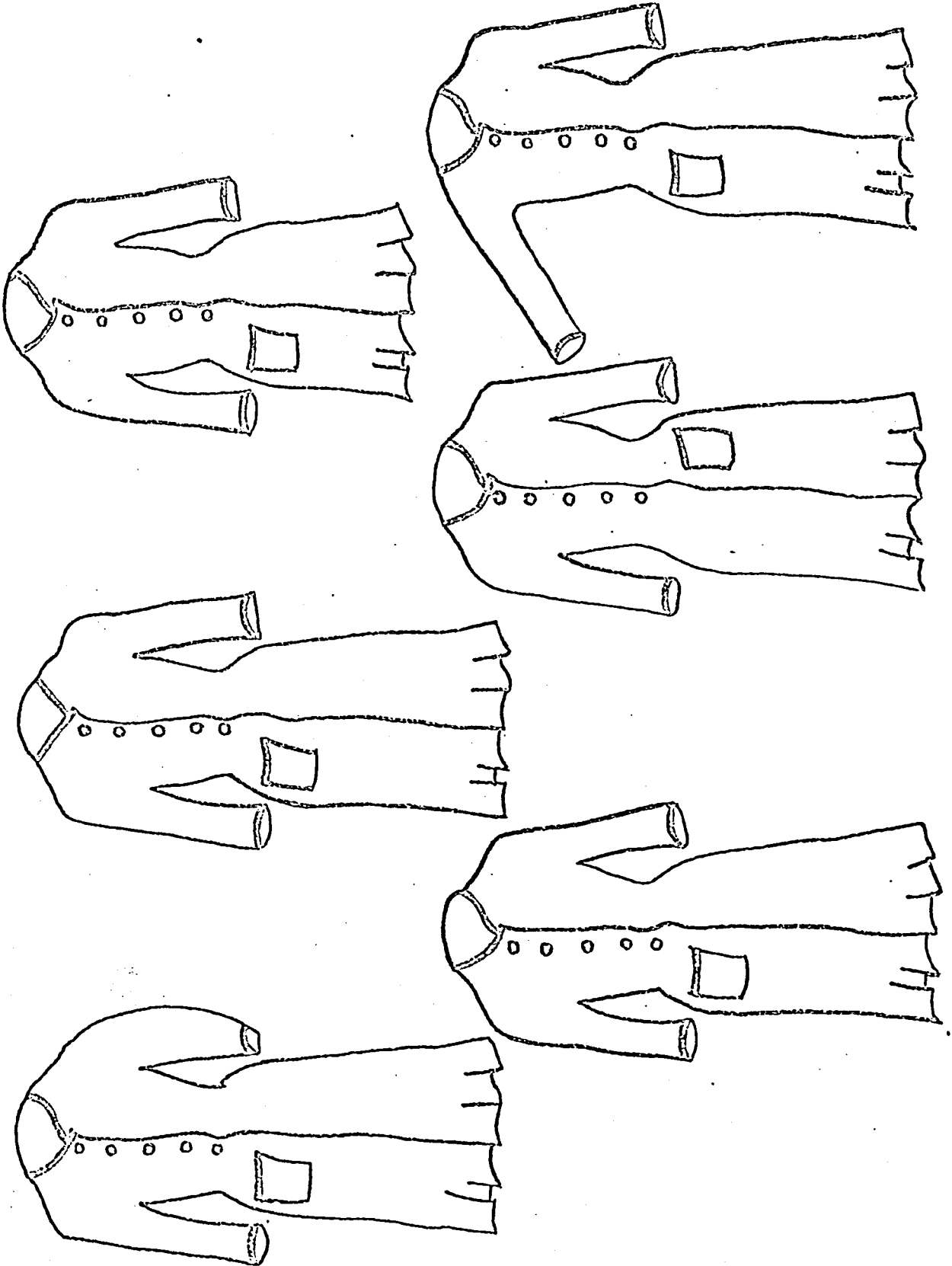




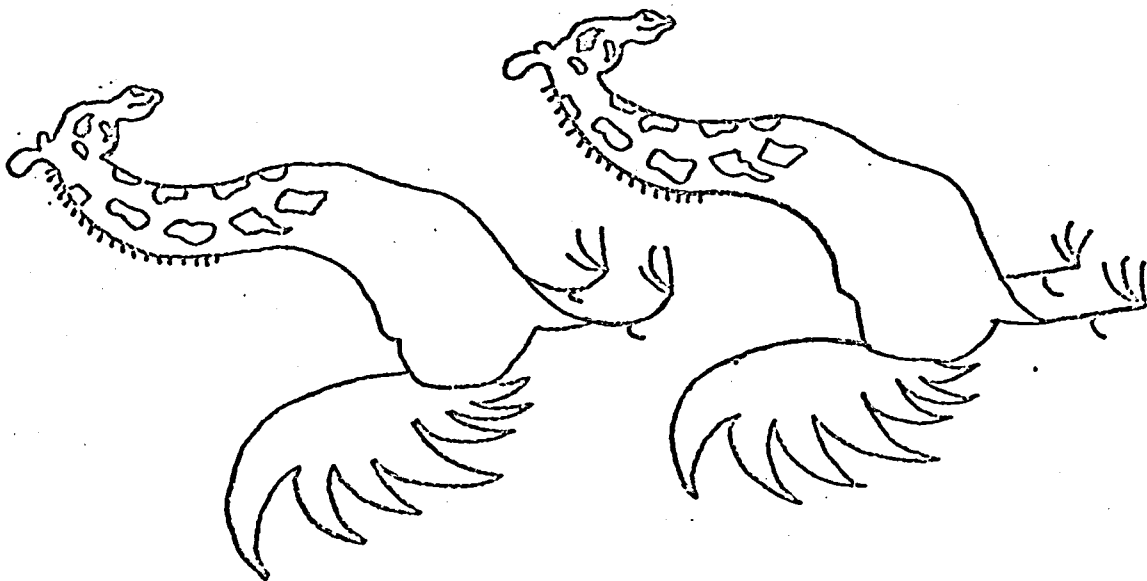
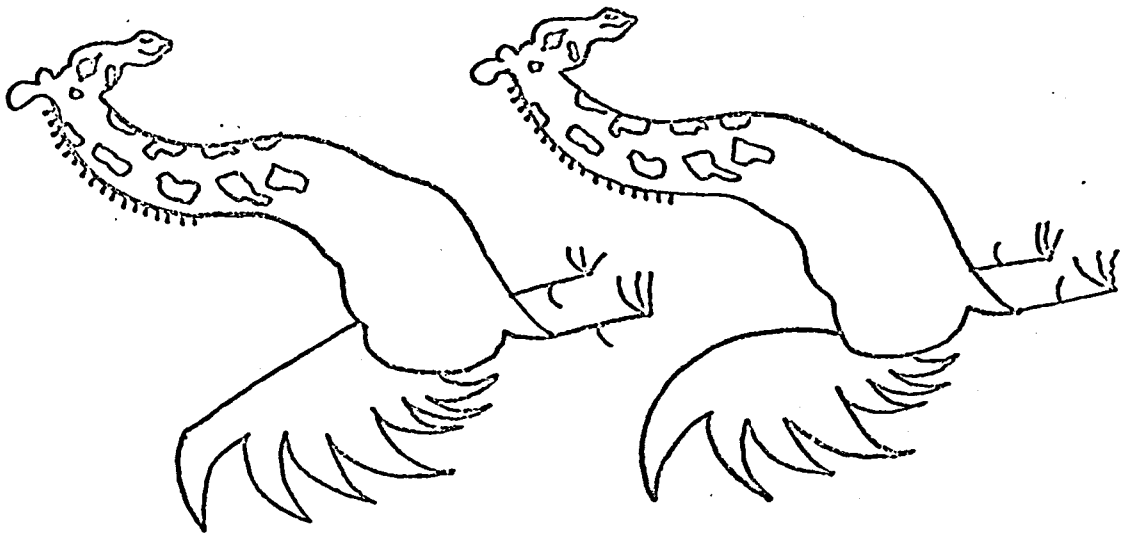
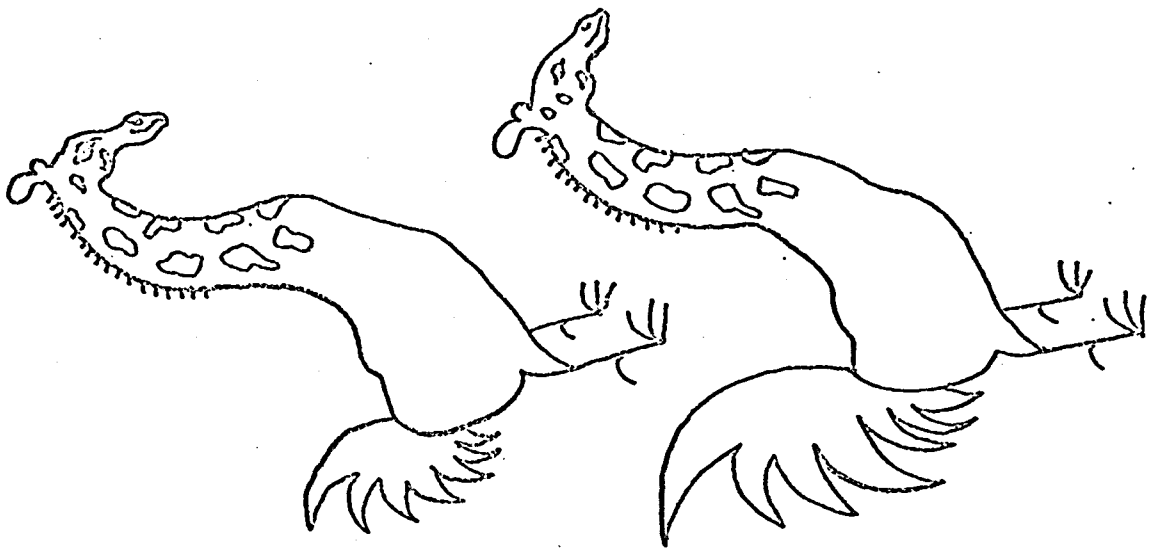


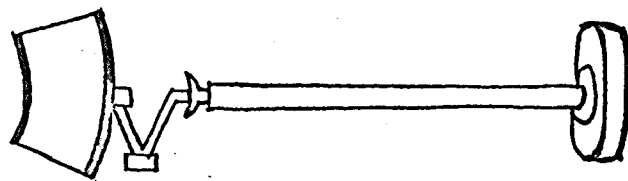


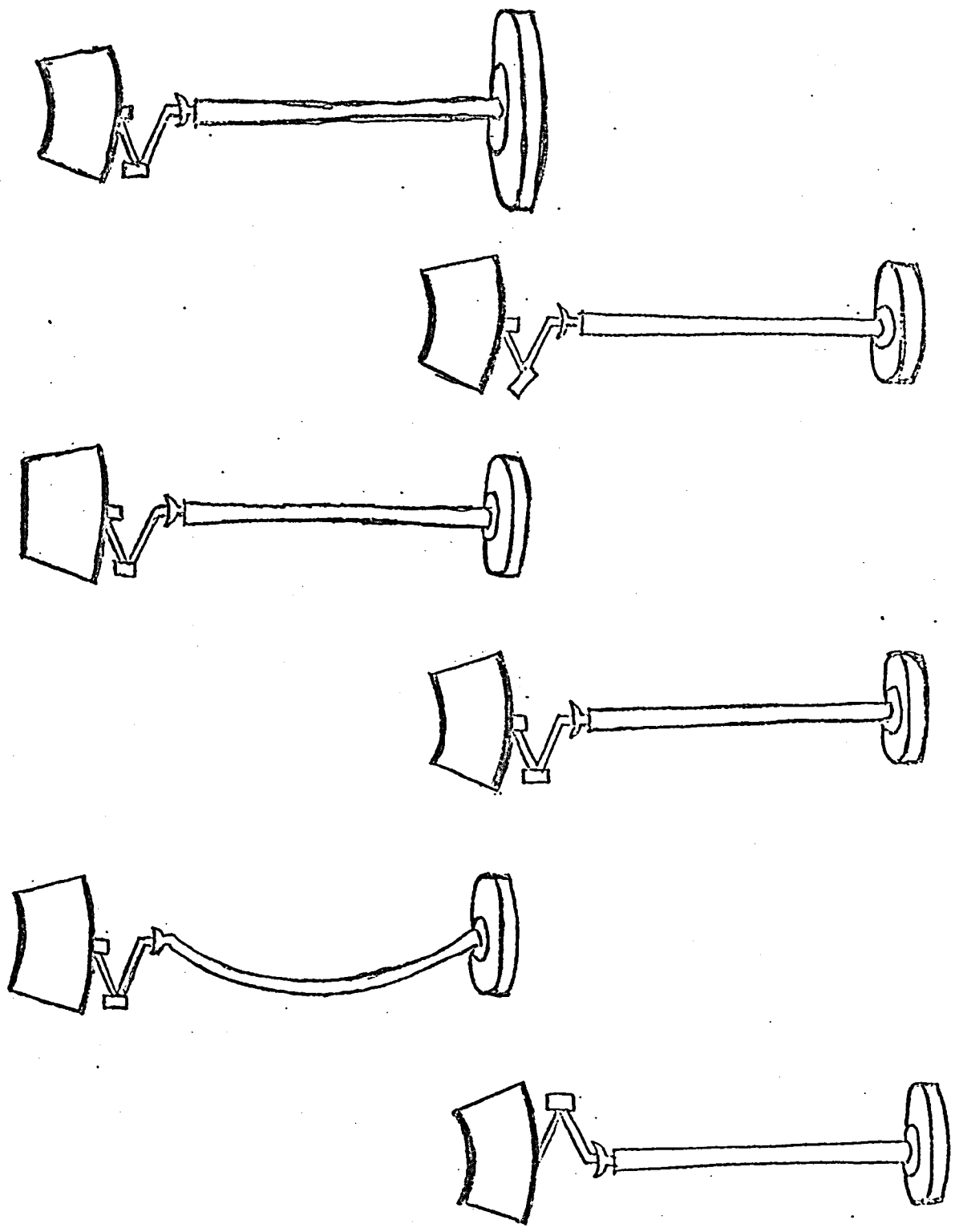


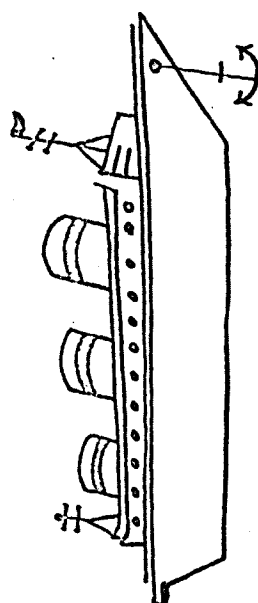


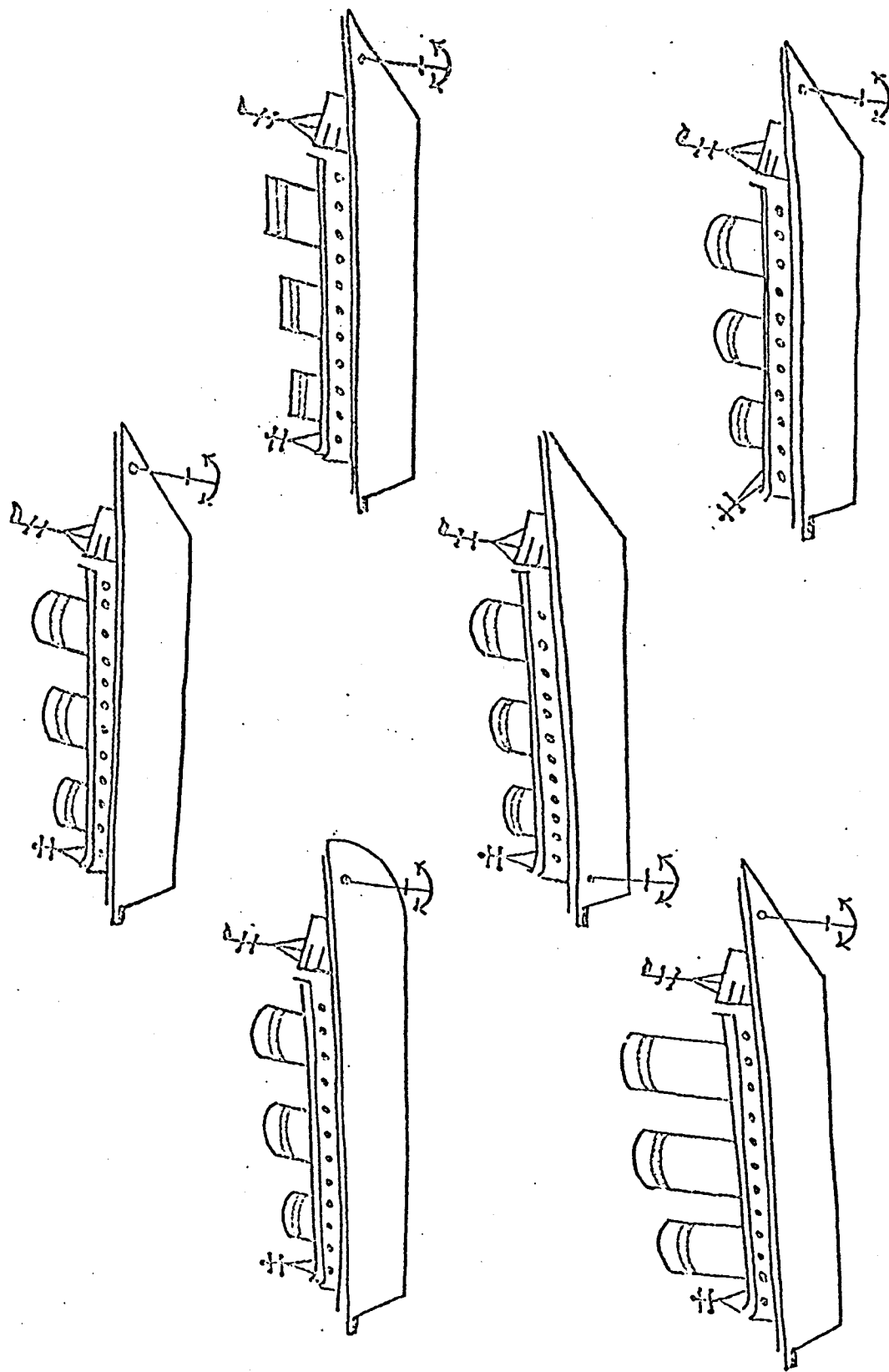


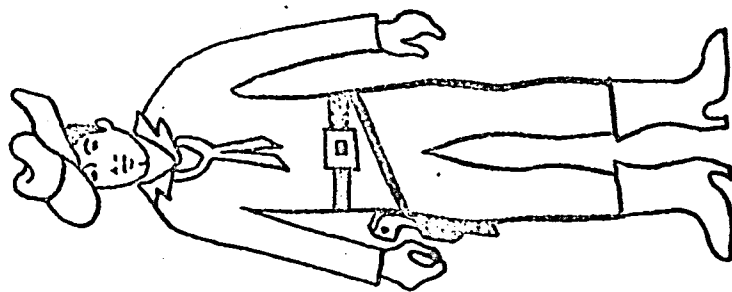


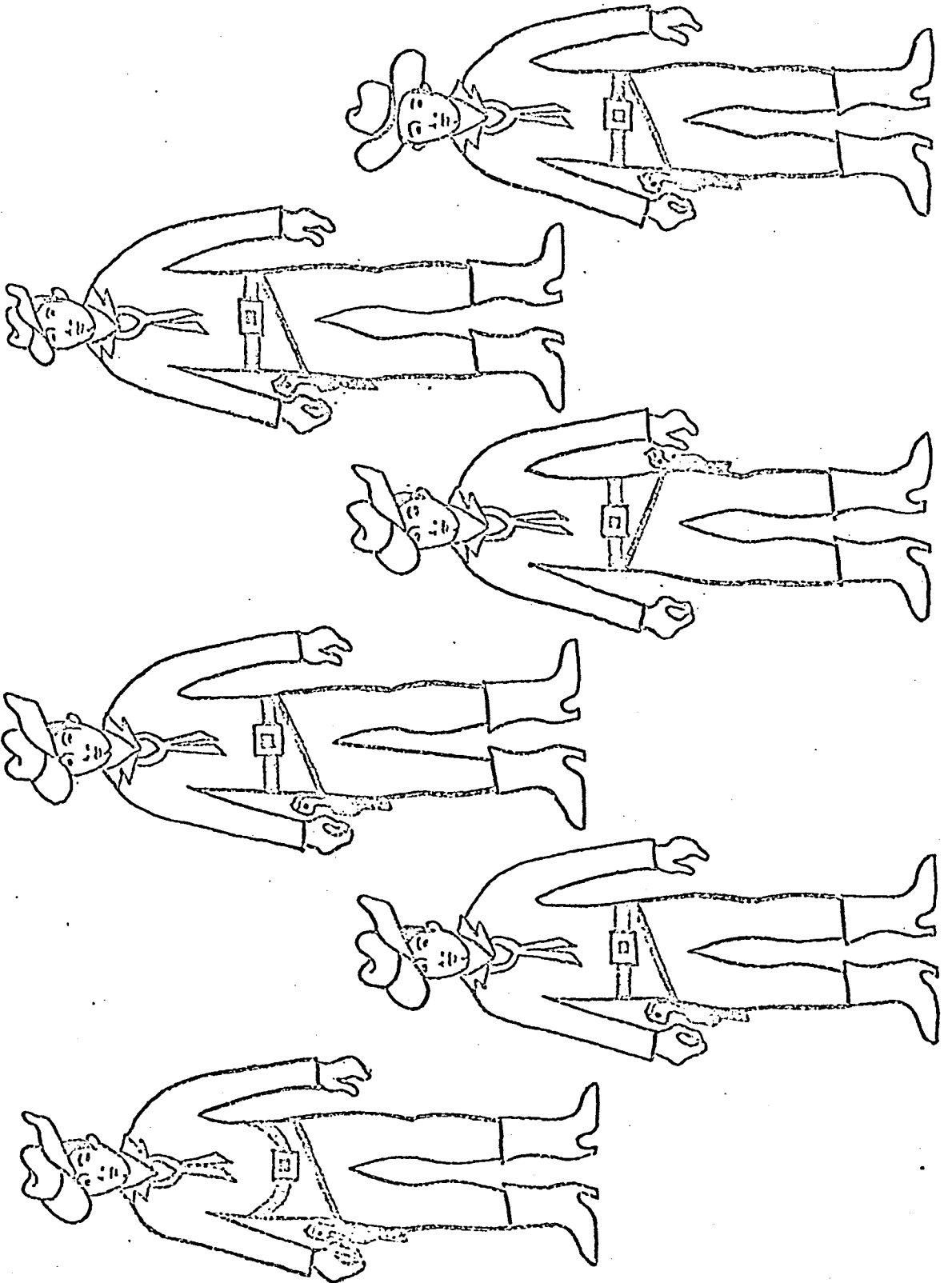












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