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The Effects of Age, Sex, Social Class, and Ethnic Group on Social Abstract Intelligence in Middle Childhood

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THE EFFECTS OF AGE, SEX, SOCIAL CLASS, AND ETHNIC GROUP
ON SOCIAL AND ABSTRACT INTELLIGENCE IN MIDDLE CHILDHOOD

by

William P. Bryant

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University of Chicago in Partial Fulfillment
of the Requirements for the Degree of

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VITA

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CHAPTER I

INTRODUCTION

Psychologists have studied the effects of non-intellectual variables on tests of intelligence for several decades, but most of their investigations have concerned the effects of these variables on what is sometimes called abstract intelligence, as distinct from social intelligence. The present study was designed to investigate the influence of four non-intellectual and nonpsychological variables -- age, sex, social class and ethnic group -- on selected measures of social and abstract intelligence. (The terms effect and influence have been used repeatedly in the present study to mark the relationship between what are conceptualized as independent and dependent variables; however, these terms imply relationship or correlation rather than causality.)

Tasks measuring intelligence have been distinguished from each other in countless ways; and, over the years, evidence has accumulated that certain task variables have factorial or construct validity while

others do not. Perhaps the most thoroughly investigated task variable, one which has repeatedly been shown to have construct validity, is based upon the fact that certain tasks require a verbal response while others require a nonverbal response. This, of course, is the verbal-performance distinction, a variable which not only has construct validity but which is affected by numerous nonintellectual variables. In the present study, the task variable defined by the verbal-nonverbal distinction refers to the verbal-performance distinction.

Most intelligence tests, including the Wechsler scales, do not distinguish between social and abstract intelligence; however, several traditions within academic psychology do make that distinction, either explicitly or by implication. Two such traditions, perhaps the major ones, have culminated in the work of Guilford, on the one hand, and in the work of Feffer and Flavell, on the other. Feffer and Flavell require the subject to take the role of another or adopt his point of view. The present study has employed their measures of role taking. Guilford requires subjects to make inferences about people.

In the present study, the author has adapted Guilford's approach, distinguishing between human and nonhuman content.

For purposes of the present investigation, then, the construct of intelligence was partitioned by three task variables: point of view, task content and response modality. With regard to point of view, tasks were either role-taking or nonrole-taking. With regard to task content, tasks were either human or nonhuman. With regard to response modality, tasks were either verbal or nonverbal. The three task variables were varied independently and combined in the logically possible ways to produce eight subconstructs of intelligence:

<u>Point of View</u>	<u>Task Content</u>	<u>Response Modality</u>
1.role-taking	human	verbal
2.role-taking	human	nonverbal
3.role-taking	nonhuman	verbal
4.role-taking	nonhuman	nonverbal
5.nonrole-taking	human	verbal
6.nonrole-taking	human	nonverbal
7.nonrole-taking	nonhuman	verbal
8.nonrole-taking	nonhuman	nonverbal

One and two are measures of social intelligence by both definitions. Three through six are measures of social intelligence by one criterion, measures of abstract intelligence by the other. Seven and eight are measures of abstract intelligence by both criteria. The first subconstruct was measured by Feffer's Role Taking Task, the second by a pantomime task, the third by Krauss and Glucksberg's communication task, the fourth by a perceptual role-taking task; the fifth by a modification of the Comprehension subtest of the Wechsler Intelligence Scale for Children, the sixth by part of the Object Assembly subtest of the Wechsler Intelligence Scale for Children, the seventh by a modification of the Information subtest of the Wechsler Intelligence Scale for Children, and the eighth by the Block Design of the Wechsler Intelligence Scale for Children.

The eight tasks in the present study were analyzed in three ways: (a) as individual tests, (b) as elements of a total score and (c) values on the task variables of point of view, task content and response modality.

In the remainder of the introductory section, the author considers the independent and dependent variables separately before reviewing studies bearing on the relationship between them. The purpose of discussing the independent variables is to give a brief rationale for the choice of variables and values on the variables. The purpose of discussing the dependent variables is to summarize the evidence for their validity as variables of personality.

The Independent Variables

Age is, of course, a major variable in the study of development, or at least a major yardstick against which development is measured. The age span considered here, middle childhood, has particular significance for the development of role taking. The years of middle childhood are the years when the child decenters, or begins to be able to take into account more than one aspect of a situation. Regarding the general significance of middle childhood, Fitzgerald and McKinney (1970) wrote, "The period of 'middle childhood' covers roughly the ages from five to twelve; that is, the elementary school years" (p. 277). In regard to the changes which might be expected to

occur in relation to the development of role taking, Fitzgerald and McKinney (1970) wrote, "Surely the development of concrete operations, about the age of six or seven, could serve as the landmark for the onset of 'middle childhood.' Now the child begins to 'decenter,' or consider an object from more than one perceptual perspective. He can make inferences about operations" (p. 281).

Despite the fact that sex has seldom proved to be a significant variable affecting intelligence test scores (differences, when statistically significant, have usually been slight) it has been enormously important in other areas of psychology. And the effect of sex on measures of social intelligence has not been thoroughly explored.

Regarding the importance of social class as a variable which influences intelligence test scores, Eells, Davis, Havinghurst, Herrick and Tyler (1951) wrote in their classic study:

As indicated ... modern sociologists and cultural anthropologists place a great deal of importance upon the location of an individual in the social-class structure of his community as a basic determiner of many of the cultural and environmental experiences which a child may be expected

to have. Since it is these differences in cultural experiences which may affect the responses of pupils to intelligence-test items, an analysis of test responses in terms of these larger social-class concepts seems to be indicated. (p. 90)

Following common practice, Eells et al.

(1951) used multiple criteria of occupation, source of income, type of house lived in and dwelling area in the community to develop an index of social class. Other criteria of social class which might have been used include amount of income and homogeneity of neighborhood with respect to social-class composition. The present study employed the Coleman Index (Coleman, 1959) which uses the criteria of occupation and amount of income; however, for reasons of expediency, only the occupational criteria were considered. As have most studies, the present study compared middle-class children with lower-class children.

Ethnic group is another variable which has been shown to affect intelligence test scores. While the standard use of the term 'ethnic group' is reserved for the study of distinctive minority groups in a modern nation state (Harding, Proshansky, Kutner and Chein, 1971), most of the studies on the

effect of ethnic group on intelligence test scores have compared American blacks with American whites. Indeed, Shuey (1966) has summarized hundreds of studies about the differences between the performance of blacks and whites on intelligence tests.

The Dependent Variables: Three Task Variables,
Eight Subtests

The three task variables all have significant places in the history of psychology. In 1926, Piaget wrote regarding the egocentrism of the child, "This talk is egocentric, partly because the child speaks only about himself, but chiefly because he does not attempt to place himself at the point of view of his hearer" (1955, p. 9). This statement, of course, refers to the young child's inability to take the role of the other. While Piaget confined himself to a consideration of impersonal tasks, Feffer (1959) and Flavell, Botkin, Fry, Wright and Jarvis (1968) extended the study of role taking to tasks involving people. Somewhat earlier, in 1920, Thorndike distinguished social from abstract intelligence based, implicitly, on differences in content, "By social intelligence is meant the ability to understand and manage men and women, boys and girls -- to act wisely in human re-

lations" (p. 228). For Thorndike, social intelligence was distinguished from abstract intelligence (the ability to use symbols and ideas) and mechanical intelligence (the ability to use mechanisms). The verbal-nonverbal distinction has, of course, greater antiquity and significance in the history of psychology. DuBois (1970, pp. 52-53), while rather vague on the subject of the origin of the distinction between verbal and nonverbal tasks, mentioned that Seguin, who died in 1880, used a form board for training retarded children and that Woodworth in 1904 used a form board as well as other performance tests to measure racial differences. Through the first two decades of the 20th century, several nonverbal tests were developed. Wechsler's was one of the first, if not the first, to put verbal and nonverbal tasks together into a single comprehensive battery yielding scores for individual subtests, for verbal and nonverbal tasks and for total scores.

Irrespective of the place which psychological tradition gives to the concepts of point of view, task content and response modality, the interrelationships among the concepts, as reflected by the intercorrelations among the measures which have been used to operationalize them, require consideration. Historical

legitimacy of concepts does not guarantee their validity.

The question of validity in the present study refers, of course, to the notion of construct validity. Fiske (1971, pp. 257-273) has summarized the procedures required to demonstrate the validity of personality constructs. There are two ways in which construct validity can be demonstrated: (a) it may be shown that measures of the construct in question correlate more highly among themselves than they do with measures of related constructs from which they are distinguished, or (b) it may be shown that the construct corresponds to a factor in a factor-analytic study which includes tests thought to measure the construct in question and related constructs from which it is distinguished.

In the present study, each task variable was defined by specific attributes of the task, and it was possible to select tasks so they could be assigned unambiguously to one of the values on the task variable in question. Thus, theoretically, given a large number of tests, measures of role taking should correlate more highly with each other than they would with measures of nonrole taking. The same should also apply to the other task variables.

The fact that, in the present study, each test was assigned a value on each of the three task variables complicated the picture. Any test of role taking, for example, had more attributes in common with some tests of nonrole taking than with some other tests of role taking. Tests were expected to correlate most highly with other tests they shared two traits with, moderately with tests they shared one trait with and virtually not at all with those they shared no traits with. Irrespective of the correlations among the tests used, an independent variable with a marked effect on one of the task variables was expected to produce a noticeable effect upon the means scores of those tests taken together.

Several studies bear on the relationship between the role-taking and nonrole-taking constructs. Perhaps the most important are two recent factor-analytic studies by Stephens, McLaughlin and Miller (1972) and DeVries (1974). Each study included one or two measures of role taking as part of a much larger battery which included both Piagetian measures of intelligence and psychometric measures of intelligence or tests of academic achievement. Stephens et al. (1972) used several Piagetian measures, including a

perceptual role-taking task, the Wechsler Intelligence Scale for Children or the Wechsler Adult Intelligence Scale and the Wide Range Achievement Test in children ages 6-18. Their analysis yielded five factors. All of the Wechsler subtests, as well as spelling, arithmetic and reading from the Wide Range Achievement Test loaded strongly on the first factor, which was clearly a nonrole-taking factor. The authors called the second factor an "operational thought" factor. Many of the Piagetian measures, especially the measures of conservation, loaded strongly on this factor, some reaching the .70s. Spatial tasks, including tasks of perceptual role taking, loaded moderately (.20s to .40s) on this factor. The strongest loading of the Wechsler scales was .23 for Comprehension. The third factor was a classificatory thought factor, and only tasks measuring classificatory thought loaded even moderately on it. The fourth factor was a spatial operations factor, defined by Piagetian tasks requiring the coordination of perspectives. The fifth factor was a visual perceptual synthesis factor, and it was defined by moderate loadings of some nonverbal tasks of the Wechsler scales. It should be noted that tasks specifically involving perceptual role taking loaded weakly

on each of the first four factors, especially the second factor. Thus, based on the studies of Stephens et al. (1972), it appears that tests of perceptual role taking measure something different than measures of nonrole taking, though there is overlap, but it does not appear from that study that they represent a distinct ability. This, of course, does not imply that several measures of role taking, if given in the same battery, might not define a separate factor.

DeVries (1974) synthesized previous factor-analytic studies which have included Piagetian and psychometric measures and then reported results of her own study. Her general conclusion from the findings of previous studies was that they "suggest some degree of overlap and some degree of nonoverlap of psychometric and Piagetian measures of intelligence" (DeVries, 1974, p. 748). In her own study, DeVries included a guessing game which involved guessing which hand the experimenter had hidden a penny in. Performance on the task was evaluated according to the sophistication of the guessing strategy, which was taken to be a measure of role-taking skill. This was a verbal task analogous to the communications task in the present study. In a first factor analysis, which included just the Piage-

tian tasks and the Stanford-Binet MA, the guessing game loaded moderately on a factor defined by the Stanford-Binet, a heavily verbal test, and on another factor defined by an object sorting task. In a second factor analysis, which included scores from the California Test of Mental Maturity and the Metropolitan Achievement Test as well as Piagetian tasks and the Stanford-Binet, the guessing game defined one minor factor and indeed did not load significantly on other factors. Here again the evidence is ambiguous. If a limited number of Piagetian and psychometric tasks make up the battery, the distinction between role taking and non-role taking on verbal tasks may be unjustifiable; however, given a more comprehensive battery of intelligence and achievement tests, there may be justification for asserting that role-taking ability is indeed different from other intellectual abilities.

Besides the factor-analytic studies of broad spectrum, quite a few studies have examined the relationships among measures of role-taking or the relationship between measures of role taking and measures of abstract intelligence. Bowers and London (1965) found, with age partialled out, a .076 correlation between two measures of role-taking, the Dramatic Acting Test and

the Children's Hypnotic Susceptibility Scale, while the correlations with the vocabulary subtest of the Wechsler Intelligence Scale for Children were .39 and .56, respectively. Chaplin and Keller (1974) correlated scores on a perceptual role-taking task and the Role Taking Task among third and sixth graders who were classified as either popular or unpopular. Correlations were significantly only among unpopular third graders ($r = .78$). Coie and Dorval (1973) set out to determine whether performance on a communication task could be predicted as well from measures of abstract intelligence as from another role-taking task. The authors compared the correlations between Raven's Progressive Matrices, a vocabulary test and a perceptual role-taking task with the communication task, distinguishing between boys and girls sending or receiving messages. With age partialled out, the correlations between the three measures and communication were low to moderate, with no clear pattern emerging in the correlations to distinguish the perceptual role-taking task from the others: in other words, it was not possible to say that the perceptual role-taking task was superior to the Progressive Matrices, a measure of nonverbal intelligence or to the vocabulary test, a

measure of verbal intelligence, as a predictor of communicative ability. Hollos and Cowan (1973), on the other hand, correlated the performance of subjects on role-taking tasks, conservation tasks and classification tasks. Their study yielded two factors, one a logical-operations factor, corresponding to the nonrole-taking tasks and the other a role-taking factor. Lesser, Fifer and Clark (1965) reported the intercorrelations among four sets of tasks: verbal, reasoning, number and space. Space included a perceptual role-taking task. The results indicated moderate correlations among the combined measures of each of the four, with higher correlations (in the .70s) among tasks measuring number and tasks measuring reasoning and lower correlations (in the .40s) between verbal tasks and tasks measuring spatial reasoning. Krauss and Glucksberg (1969) reported no relationship between IQ and communication accuracy; however, the population was one of restricted IQ range. Rubin (1973) studied correlations among measures of verbal intelligence, role taking, conservation, popularity and several factors not relevant to the present study. He reported, with age partialled out, statistically significant correlations in the .30s among the measures of role taking. The whole study yielded a single decen-

tration factor and a second factor on which only popularity loaded highly. Both chronological age and mental age loaded on the decentration factor. The implication of Rubin's study is that role-taking tasks do not measure something different than standard measures of verbal intelligence. In a simpler study, Rubin (1974) examined the correlations between a perceptual role-taking task and the Krauss and Glucksberg communications task among second graders, sixth graders, college sophomores and the elderly. The correlations (.36 and .48) were significant only among sixth graders and college sophomores. Sullivan and Hunt (1967) examined the relationships among intelligence, performance on a perceptual role-taking task and performance on the Role Taking Task in children ages 7, 9 and 11. Correlations, with intelligence partialled out, were .25, .00 and .35 for the different ages. Only the last correlations was significant at the .05 level. Turnine (1975) correlated the Role Taking Task with the Piagetian Floating Objects Task and the Balance Beam Task among children ages 7, 9 and 12. Generally, correlations between the Role Taking Task and the Piagetian tasks were not significant. The most general finding was a moderate positive correlation between IQ

and role-taking tasks for some ages of children. Finally, as part of her study, West (1974) reported correlations between the Porteus Maze Test and measures of both perceptual role taking and verbal role taking in kindergarten and third grade children. The correlations varied between .36 and .41, indicating a significant relationship between role-taking ability and non-verbal measures of abstract intelligence.

In sum, the results are not clear regarding the validity of the constructs of role taking and nonrole taking. There is no conclusive evidence that measures of role taking correlate more highly among themselves than they do with measures of nonrole taking, either verbal or nonverbal. Some studies, however, indicate that in comprehensive test batteries measures of role taking load heavily on different factors than measures of nonrole taking.

The explicit distinction between human and non-human content as a task variable has not been significant in the study of intelligence; rather, its significance was demonstrated in abnormal psychology by White-man (1954) and Dunn (1954), who found that the performance of schizophrenics was more severely impaired on tasks depicting human social interaction than it was

on other tasks. Since schizophrenic behavior can be considered socially unintelligent, their findings make the distinction between measures of social and abstract intelligence based on task content a reasonable one.

Within the psychometric tradition, tasks measuring social intelligence have been human in content, while tasks measuring abstract intelligence have not involved the distinction and have consisted of both human and nonhuman items. Since Thorndike first made the distinction between social and abstract intelligence in 1920, a series of measures have been developed to measure social intelligence (cf. Walker and Foley, 1973); however, Guilford's measures of social intelligence are the ones most often used. Research on Guilford's measures have been used in the present study based on the assumption that this evidence bears on the human-nonhuman distinction. Guilford and Hoepfner (1971, pp. 266-268) reported that their measures of social intelligence correspond to valid factors distinct from verbal and nonverbal factors. Guilford and Hoepfner (1971) and Walker and Foley (1973), however, reported moderate correlations between measures of abstract intelligence and measures of social intelligence. Further, Shanley, Walker and Foley (1971) reported sig-

nificant correlations between Guilford's measures of social intelligence and the Otis Quick-Scoring Mental Ability Tests. Though most of the correlations were in the .30s and .40s, correlations between the Otis and several composite scores for the Guilford measures reached the .60s for ninth graders. One subtest of the Wechsler Intelligence Scale for Children, the Picture Arrangement subtest, has largely human content and has often been considered a measure of social intelligence for that reason and because subjects are asked to arrange pictures to make a story. With all the verbal scales, except Digit Span, the Picture Arrangement has shown moderate correlations, and it has shown low correlations with the other scales of the performance scale except for the Block Design, with which it has a moderate correlation (Wechsler, 1949, pp. 10-12).

Thus, it is by no means clear that human and nonhuman tasks represent valid constructs. Tests involving human content correlate significantly; however, they also correlate significantly with standard measures of intelligence, including the Block Design, which is entirely nonhuman.

The evidence from the studies of Stephens et al. (1972) and DeVries (1974) indicated that verbal and

nonverbal tasks from the Wechsler scales, even when included in a much larger battery of tests, load heavily on different factors. The Wechsler scales themselves have been factor analyzed several times. Matarazzo (1972, pp. 264-265) has summarized the findings: three factors have emerged -- a verbal comprehension factor, a perceptual organization factor and a memory factor. Comprehension and Information were among the subtests which loaded heavily on the verbal comprehension factor. Object Assembly and Block Design were among the tests which loaded heavily on the perceptual organization factor, essentially a nonverbal factor. Quereshi (1972, 1973) found the same pattern of correlations among the subtests of the Wechsler Intelligence Scale for Children.

In sum, then, there is strong evidence only for the factorial or construct validity of the verbal-nonverbal distinction. While there is much evidence about the relationship between role-taking and nonrole-taking skills, it is by no means clear what conclusions can be drawn from that evidence. If any trend can be discerned, it is that role-taking tasks correlate as highly with nonrole-taking tasks as they do with each other. There is very little evidence which can be brought to bear on

the human-nonhuman distinction. What evidence there is does not suggest that the two represent valid factors.

Relationships Between Independent and Dependent Variables

In searching the literature for relationships between the independent and dependent variables, I have looked for studies dealing with twelve categories of the dependent variables. These included the eight subconstructs and their measures, the total score, tests with and without shift of perspective, tests with and without human content and tests with and without verbal responses. Of the 48 relationships between independent and dependent variables, 42 were represented in the literature to such an extent that data could be brought to bear on the relationships, although not every such relationship led to a hypothesis.

Effects of age. The effects of age on the four nonrole-taking tasks as measured by the Comprehension, Information, Object Assembly and Block Design subtests of the Wechsler Intelligence Scale for Children have been clearly established. Children score higher as they get older. Wechsler (1949, pp. 112-113) described the "test age" for each subtest; that is, the mean raw

scores for children at various ages. Within the age range considered here, older children scored higher on the average than younger children on all four tests, though the increases were by no means uniform. The difference between younger and older children was most marked on the Block Design, where the average child 8 years 10 months old scores 5 raw-score points higher than the average child 7 years 2 months old, and the average child 10 years 10 months old scores 9 raw-score points higher than the average child 9 years 2 months old.

The effect of age on role taking, categorized as human and verbal and as measured by the Role Taking Task, has also been clearly delineated. With one major exception, studies have shown that performance on the Role Taking Task and related tasks improves with age. In one of his first published studies, Feffer and Gourevitch (1960) found that older children did indeed score higher than younger ones in the age range 6-13. Turnine (1975) also found that scores on the Role Taking Task improved for ages 7-11. Sullivan and Hunt (1967) got similar results on the Role Taking Task with children of the same age group. Several other measures involving role taking, human content and verbal re-

sponse have shown comparable results. Bowers and London (1965) found that children ages 5-11 improved on the Dramatic Acting Test and the Hypnosis Simulation Test. Alvy (1968) got the same results with a communication task with ambiguous stimulus figures. The task resembled that of Krauss and Glucksberg, but the figures were human faces and the expressions were ambiguous. Flavell et al. (1968) found increases on two different tests of role-taking ability. Selman (1971) and Selman and Byrne (1974) found the same thing on another test of role taking. Rothenberg (1970) found that fifth graders had a significantly higher mean score than third graders on a task which required them to predict the emotional impact of story situations on the actors in the story. Flappan (1968), studying children of ages 6, 9 and 12, found that their ability to make inferences about feelings, thoughts and intentions increased with age. The only exception is the study of Hollos and Cowan (1973), who found that children age 7 and 9 did not differ significantly in role-taking ability as measured by the Role Taking Task.

The effect of age on the role-taking, nonhuman, verbal category, measured by the Krauss and Glucksberg communication task, has been shown to be consistent

with the above: children improve as a function of age. This has been found to be the case, with minor exception, irrespective of how the construct is measured. Krauss and Glucksberg (1969) and Glucksberg and Krauss (1967) found this for the age range in question. Coie and Dorval (1973) found improvement for grades two through four. Peterson, Danner and Flavell (1972) found that by age 7, children could respond to the task effectively. Flavell et al. (1968) found improvement through the years of middle childhood on a task which required one subject to describe a stimulus display to a blindfolded subject. Rubin (1973), on the other hand, found improvement on the communication task for grades kindergarten through four, but not for grades four through six.

The effect of age on the role-taking, human, nonverbal construct, measured in the present study by a pantomime task, has received scant attention in the literature. Most studies (e.g., Borke, 1971) have used tasks requiring nonverbal responses to establish the age range during which role-taking behavior first manifests itself in the child, thus eliminating the possibly confounding variable of verbal development. The pantomime task is an adaptation of an acting task developed

by Flavell et al. (1968) which required the subject to take the role of a shy child and then a bold child. The original acting task, however, was scored primarily for verbal behavior. The authors found little difference between grades three and seven, but they did find marked improvement between grades seven and eleven.

The effect of age on the role-taking, nonhuman, nonverbal category, measured by Flavell's task of perceptual role-taking, generally seems to be a steady improvement in score. In the original study with their modification of Piaget's Mountain Task, Flavell et al. (1968) found steady improvement for grades two through eleven. Studies by Turnine (1975), Coie and Dorval (1973), and Sullivan and Hunt (1967) showed comparable results for middle childhood. Selman (1971) has shown improvement in this category for even younger children. Rubin (1973) found significant changes in perceptual role taking for grades kindergarten through six. Hollos and Cowan (1973) again represent the exception, having found no significant changes for the age range 7-9.

Two studies have addressed themselves to the effects of age on role-taking tasks, in contrast to

nonrole-taking tasks. Hollos and Cowan (1973) found that performance on Piagetian tasks which did not involve role taking improved as a function of age while that of role-taking tasks did not, at least during middle childhood. Rubin (1973), however, found that scores on several measures of role taking increased significantly between kindergarten and sixth grade. This improvement was not compared with scores on nonrole-taking measures.

There is little evidence bearing on the effect of age on tasks with and without human content. Shanley, Walker and Foley (1971) reported significant improvement with age in scores for all of Guilford's cognitive behavioral measures, but there is no reason to suppose that this distinguishes such tasks with human content from tasks without human content.

There is no evidence to suggest that age affects verbal and nonverbal tasks differently.

Since there is evidence that tasks measuring all of the individual categories improve in score as a function of age, the total score should improve as a function of age as well.

Effects of sex. The effect of sex on nonrole-taking tasks (Comprehension, Information, Object Assem-

bly, and Block Design) has been succinctly summarized by Matarazzo (1972):

A third factor which might be thought of as possibly important in the standardization of an intelligence test is that of sex differences. With respect to this factor most of the available data, until recently, related to differences in test performance of boys and girls. Briefly summarized, the data showed occasional significant, although generally small, differences on certain individual tests. For example, boys tend to do better on arithmetical reasoning, and the girls better on vocabulary tests. (p. 224)

Matarazzo (1972, p. 200) has reproduced findings about sex differences on individual subtests of the Wechsler intelligence scales for boys and girls age 16. On all the tests, girls scored slightly higher than boys, but with one exception the differences were less than 1 scale-score point. In other words, when statistically significant differences have been found between the performance of boys and girls on nonrole-taking tasks, they have been rather small.

Available evidence bearing on the effect of sex on role-taking tasks is largely negative or ambiguous. Turnine (1975) reported no significant sex difference for children ages 7-12 on Feffer's Role Taking Task. Bowers and London (1965), Rothenberg (1970), and Selman and Byrne (1974) did not find sex differences on other role-taking, human, verbal tasks. Rubin (1972,

(1973) did not find significant sex differences on the Krauss and Glucksberg Communication Task for grades kindergarten through six. Coie and Dorval (1973), however, found boys superior to girls on one of two perceptual role-taking tasks. Shanley et al. (1971), using Guilford's measures of behavioral cognition, found that girls scored significantly higher than boys on two of six tasks, Missing Pictures and Social Translations, as well as on several composite scores. It is difficult to interpret the meaning of these results since Social Translations, which involves choosing a pair of persons for whom a given statement would have unique meaning, clearly involves role taking, while Missing Pictures, which involves choosing a picture which best completes a sequence, does not unambiguously involve role taking. Finally, there is no evidence to support an hypothesis of sex differences on the acting task. In sum, with the possible exception of the perceptual role-taking task, there is no evidence to support sex differences on the role-taking tasks, and the evidence for sex differences on human or nonhuman tasks is ambiguous.

Effects of social class. Lesser et al.

(1965), in the most elaborate study of the

effect of social class (and ethnic group) on a variety of measures of intelligence, have concluded that social class affects level of performance on intellectual tasks but does not affect pattern of scores; for example, lower-class Chinese scored approximately 4 scale-score points lower than middle-class Chinese on all tests, and for both middle- and lower-class Chinese scores on verbal tests were approximately 6 points lower than on other tests.

With regard to the effects of social class on nonrole-taking tasks, Estes (1953) studied the effects of social class on the individual subtests of the Wechsler Intelligence Scale for Children. She found that middle-class children scored higher on all the subtests than lower-class children.

With regard to the effects of social class on measures of role taking, the evidence is less clear. Sullivan and Hunt (1967) found that children from higher social classes scored higher on the Role Taking Task. Pozner and Saltz (1974) found that middle-class children were better communicators than lower-class children on the Krauss and Glucksberg communication task, but that they did not differ as receivers of communication. Sullivan and Hunt (1967) and Lesser et

al. (1965) found that middle-class children did better than lower-class children on tasks of perceptual role taking.

With regard to the task variables considered in the present study, there is only evidence that social class influences the difference between verbal and nonverbal scores. Generally, results of intelligence tests indicate that class differences are greater on verbal than nonverbal items (Butcher, 1968; Eells et al., 1951; Reese & Overton, 1972). Estes' (1953) findings were consistent with this, but they indicated that differences are small (11 points on the average for verbal, 8.5 points for nonverbal). Virtually all the evidence suggested that higher-class children perform better on both verbal and nonverbal tasks measuring intellectual ability than lower-class children.

Effects of ethnic group. Perhaps the most general finding is that blacks tend to score lower than whites on all measures of intelligence (Lesser et al., 1965; Shuey, 1966; and Butcher, 1968). There is also a well documented tendency for blacks to do better on verbal than on nonverbal tasks (Shuey, 1966). Lesser et al. (1965) found that blacks scored lower on a measure of perceptual role-taking ability than on verbal

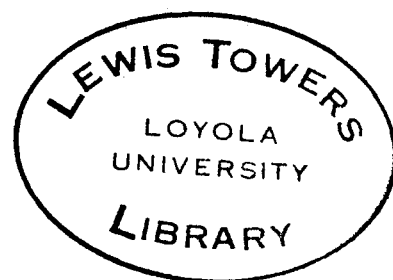
tasks, a finding consistent with the general finding of verbal-nonverbal differences.

Hypotheses

In those cases where one of the independent variables affects several dependent variables in the same way, those relationships have been stated as one hypothesis.

1. Older children score significantly higher than younger children on all subtests and on total score.
2. Boys score significantly higher than girls on perceptual role taking.
3. Middle-class children score significantly higher than lower-class children on all subtests and on total score.
4. Verbal scores for middle-class children minus verbal scores for lower-class children is significantly greater than nonverbal scores for middle-class children minus nonverbal scores for lower-class children.
5. White children score significantly higher than black children on all subtests and total score.
6. Nonverbal scores for white children minus nonverbal scores for black children is significantly

greater than verbal scores for white children minus
verbal scores for black children.



CHAPTER II

METHOD

Subjects

The subjects were 48 children, two from each of 24 categories defined by three age levels (7-8, 9-10, and 11-12), the two sexes, two social classes (middle and lower), and two ethnic groups (black and white). The children came from three sources: three parochial schools, one public school, and children of acquaintances of the examiner. To secure the children, the examiner approached the school or the parents stating that he needed children falling into the groups in question. The school or parents were informed that the examiner wanted to find out how children of different ages and backgrounds did on a variety of measures of social and abstract reasoning skills, that the testing would take from 60 to 90 minutes, that children generally enjoyed the tasks, and that in return the examiner would be pleased at a later date to explain and demonstrate the procedures to the parents. He also said that the general results of the study would be made available to parents and school. In each instance the examiner stressed that he wanted to test

only "normal" children, children without learning disabilities or behavior problems.

The test results from five children were not used because it was learned that one had a learning disability, two duplicated subjects already tested on the social-class variable, and two were tested to demonstrate to the parents that the tests were enjoyable and a useful learning experience.

Social class was determined by the occupational criteria of the Coleman Index (Coleman, 1959). The Coleman Index divides occupational groups into seven categories (upper class, upper middle, middle middle, lower middle, upper lower, middle lower, and lower lower). For purposes of the present study, the categories were rated on a 7-point scale, lower lower being assigned a rating of 1, upper being assigned a rating of 7. In all but one or two cases, both parents belonged to the same class. In those cases in which both parents did not belong to the same class, the child was assigned the class of the higher-class parent. Both parents of every child tested belonged to the same ethnic group, either black or white. Table 1 presents the mean and standard deviations for age and social class for the total number of subjects as well

Table 1

Means and Standard Deviations of Age and Social Class
for Age, Sex, Social Class and Ethnic Group

		<u>N</u>	<u>Age</u>		<u>Social Class</u>	
			<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Age	7-8	16	7.90	.68	3.56	1.63
	9-10	16	10.01	.51	3.75	1.55
	11-12	16	11.56	.41	3.83	1.59
Sex	Male	24	9.93	1.59	3.63	1.58
	Female	24	9.72	1.65	3.50	1.56
Social Class	Middle	24	9.88	1.63	4.92	.65
	Lower	24	9.76	1.62	2.21	.83
Ethnic Group	Black	24	9.68	1.74	3.08	1.59
	White	24	9.96	1.48	4.04	1.40
Total		48	9.82	1.61	3.56	1.56

as for the groups defined by age, sex, social class, and ethnic group. The sample seemed to be representative of the levels of age and social class rather than limited to a narrow band within each level. Further, the means for age appeared to be approximately equal between sexes, social classes and ethnic groups. The means for social class appeared to be approximately equal between ages and sexes. The difference in social class between blacks and whites, however, was substantial. The mean for whites was 4.04 and 3.08 for blacks. Indeed, when a t test was calculated, it became apparent that such differences were unlikely to be due to chance fluctuations alone, $t(46) = 2.22, p < .05$.

With the exception of five children, all of whom were white, the subjects live in a major city. Those five children live in a well-to-do suburb.

Materials

Subjects were tested in a small quiet room with one large and one small table and two chairs. A large cardboard screen was used to separate the subject from the experimenter in the Object Assembly task and the Krauss and Glucksberg communication task. The Role Taking Task and the Krauss and Glucksberg communication task were recorded on a cassette recorder. The

only other piece of equipment was a stop watch used to time Block Design and Object Assembly.

All subjects took all eight tests, the youngest group taking a measure of conservation as well. (See Appendix A for the actual protocols which include instructions for administering and recording the tests.) The following are the tests used to measure the various constructs:

1. Role taking, human, verbal was measured by Feffer's Role Taking Task (Schnall & Feffer, Note 1). Subjects made up stories to cards four and eight of the Children's Apperceptive Test (Bellak, Bellak, Haworth & Hurvich, 1965). The cards with human rather than animal figures were used. Card four is a picture of a woman carrying an infant followed by a child on a tricycle. Card eight is a picture of a woman talking to a child while two other adults are sitting on a nearby couch. The task was administered using the standard directions provided by Schnall and Feffer (Note 1), with the exception that if the child did not spontaneously mention feelings or outcome in the first story, he was asked, "How do they feel?" or "How does it all turn out?" The stories were scored according to the manual (Schnall & Feffer, Note 1). Since the criteria

for scoring are rather vague, the examiner and an assistant both scored 20 stories told by different subjects. The correlation between the scores was computed using the Pearson product-moment correlation coefficient, with an interrater reliability of .88 resulting.

2. Role taking, nonhuman, verbal was measured by Rubin's (1973) adaptation of Krauss and Glucksberg's communication task. In this task, the subject was asked to describe each in a series of hard-to-encode designs so that the examiner, who could not see the subject's card but who presumably had an identical set of cards, could match them from the subject's description. (See Appendix A for a more detailed description.) After the subject stopped describing each card, the examiner asked, "I don't know which one you mean. Can you tell me more about it?" Following the scoring procedure Rubin (1973) described, the initial description was evaluated according to the number of meaningful pieces of information and the response to the question was scored according to whether the subject was silent, repeated the previous description, modified it, or gave new information. (See Appendix A for more detailed information.) Meaningful pieces of information were defined as parts of the response which could

stand alone and make sense and which might be useful to an observer for distinguishing the cards. While these criteria sound quite vague, the examiner and his assistant had little difficulty in using them. To find out whether this impression was correct, the examiner and his assistant independently scored descriptions of 20 cards given by 20 subjects. Using the Pearson product-moment correlation coefficient, a correlation of .83 was obtained.

3. Role taking, human, nonverbal was measured by a pantomime task in which the subject was asked to pretend he was first a shy child and then a bold child who had come back from the zoo and was to tell the class about his trip. The subject was instructed to convey his reactions without words. This is an adaptation of Flavell's Task IID (Flavell et al., 1968, pp. 147-154). Twenty-eight children were videotaped doing the task. Then the examiner developed a 5-point scale for evaluating the performance: 0-- essentially no change in behavior in response to the question; 1-- subject alters his behavior in response to the question, but it cannot be identified as shy or bold; 2-- makes one or more minimal but appropriately bold or shy gestures; 3-- subject makes one dramatic or several minimal ges-

tures, but there is no doubt that he is acting bold or shy; 4-- subject makes at least two dramatic gestures. The videotaped materials were then grouped into five sets of five performances each by five subjects. Each set of performances had five bold and five shy portrayals. Two assistants practiced on one or two sets, discussing the scoring based on the criteria for bold and shy (see Appendix A), and they then rated two more sets independently. Using the Pearson product-moment correlation coefficient, their ratings correlated .89 and .92 with those of the examiner. Each set of performances had been constructed so that each of the five scores were represented by at least one portrayal. (See Appendix A for a more detailed description.)

4. Role taking, nonhuman, nonverbal was measured by a perceptual role taking task, Flavell's task IC (Flavell et al., 1968, pp. 55-70). The displays were constructed according to Flavell's specifications, and they were administered and scored according to his instructions. (See Appendix A for specific details of materials, administration, and scoring.) Briefly, an object display was set up between the examiner and the subject, and the subject was told to place an identical object on a piece of paper so that it looked to

him, the subject, the same as the original object display looked to the examiner. The subject was given the opportunity to try again if he failed the first time and even to walk around to see how the display looked to the examiner. The subject's productions were recorded by tracing the configuration of the objects on the paper.

5. Nonrole taking, human, verbal was measured by the Comprehension subtest of the Wechsler Intelligence Scale for Children (Wechsler, 1949). Subjects were given the entire test, which includes both human and non-human items. The only items scored were those judged to be of human content: 1, 2, 3, 4, 7, 8, 10, 13, 14. This test was chosen because the items of human content were fairly evenly distributed throughout the test.

6. Nonrole taking, nonhuman, verbal was measured by the Information subtest of the Wechsler Intelligence Scale for Children (Wechsler, 1949). Subjects were given the entire test, which included both human and non-human items, in order to adhere as closely as possible to the standard instructions. Only the nonhuman items were scored: 1, 2, 4, 5, 7, 8, 9, 10, 12, 17, 18, 19, 20, 21, 22, 24, and 27. This test was chosen because the nonhuman items were distributed through all parts

of the test.

7. Nonrole taking, human, nonverbal was measured by the Object Assembly subtest of the Wechsler Intelligence Scale for Children (Wechsler, 1949). Since the fourth figure, the automobile, was nonhuman, only the first three items were administered. Only the first and third items, the mannekin and the face, were scored. The reason for giving almost the whole test is the same for Object Assembly as it was for Comprehension and Information.

8. Nonrole taking, nonhuman, nonverbal was measured by the Block Design subtest of the Wechsler Intelligence Scale for Children (Wechsler, 1949). The entire test was given as it is supposed to be given for 8-year-olds irrespective of the age of the child. This was done because it seemed undesirable to use the different administrations specified in the manual for older and younger children in the present sample.

Procedure

Subjects were tested in a quiet room, either an empty class room or in a room of their parents' house where the testing would be undisturbed. Before testing began, the examiner explained to the subject that this was part of the examiner's schooling and that his

purpose was to find out how different kinds of children did on different tasks. It was stressed that the child would be helping the examiner get through school. The tests were described as a number of tasks resembling puzzles, questions, and games. The subject was told that some of the tasks were difficult and some were easy and that some got harder as they progressed. Once in the room, the examiner explained that some of the tests would be recorded on a cassette recorder for transcription and that some would be timed. The subject was then invited to try out the cassette recorder and the stop watch.

To control for order-of-presentation effects, the tests were given in eight different orders (see Appendix A) so that in any set of eight tests no test followed any other test more than once. Each of the eight test orders were represented an equal number of times. The sets of tests arranged in the predetermined orders were administered to the children in the order that they were tested; no systematic effort was made to distribute the different sets of tests equally among all groups.

Once testing began, the examiner went through the tests as quickly and efficiently as possible, ad-

hering strictly to the prescribed instructions whenever possible. The examiner's task was to assure that the subject paid attention and to record the data as fully as possible. After testing, the examiner thanked the subject and returned him to the classroom or to his parents.

All scoring except for the pantomime task was done by the author who was, as far as possible, unaware of the children's age, sex, social status and ethnic group. As noted previously, the reliability of the scoring of the two tests that involved the use of somewhat subjective criteria (the Role Taking Task and Krauss and Glucksberg's Communication Task) was checked by having a second tester score the same protocol as the author. Since the interscorer agreement was satisfactory (rs of .88 and .83 were obtained), it seemed justifiable to have the author score the remainder of the protocols by himself.

Since the children's responses to the pantomime task were not filmed or videotaped, each tester rated performance on the shy and bold aspects of the task at the time of testing. As noted, the interscorer agreement was satisfactory (rs of .89 and .92 were obtained),

and it therefore seemed justifiable to have the tester rate the subjects at the time of testing.

CHAPTER III

RESULTS

Statistical Procedures

Initially the raw scores for each test were transformed into standard scores based on the scores of all subjects so that comparisons among the scores from individual tests would be meaningful. The means and standard deviations of the standard scores for individual tests and combinations of tests were then computed for the different values of the independent variables of age, sex, social class and ethnic group (see Table 2).

The original plan was to analyze the results for statistical significance using a repeated-measures analysis of variance with four between-subjects factors (3 ages, 2 sexes, 2 social classes and 2 ethnic groups) and three within-subjects factors (2 points of view, 2 types of task content and 2 response modalities). Since this analysis of variance was too large for the Biomedical Program BMD 08V, which was used to do the analysis, several simpler analyses were done. These simplifications were accomplished by combining variables either between or within variables -- an approach

Table 2

Means and Standard Deviations of Scores for Tests, Task Variables and Totals Within Age, Sex, Social Class, and Ethnic Group

		Age			Sex		Class		Ethnic Group	
		7-8	9-10	11-12	M	F	mid	low	black	white
N		16	16	16	24	24	24	24	24	24
Role Taking	M	-.25	.13	.13	-.07	.07	.38	-.38	-.16	-.16
	SD	1.04	.89	1.06	1.12	.88	.83	1.02	1.05	.94
Pantomime	M	-.75	.12	.63	.21	-.21	-.04	.04	-.28	.28
	SD	.68	.74	1.04	1.11	.84	1.12	.88	.83	1.09
Communication	M	-.37	.15	.22	-.18	.19	.09	-.08	-.13	.14
	SD	1.25	.60	.99	1.03	.95	.95	1.06	1.13	.85
Perceptual	M	-.34	.32	.02	-.12	.12	.15	-.15	-.13	.12
	SD	1.01	1.24	.55	.93	1.07	1.21	.73	1.09	.91
Comprehension	M	-.61	.11	.49	.27	-.27	-.07	.07	-.37	.36
	SD	.52	.95	1.13	1.05	.89	1.04	.98	.71	1.12

Table 2 (continued)

Means and Standard Deviations of Scores for Tests, Task Variables and Totals Within Age, Sex, Social Class, and Ethnic Group

		Age			Sex		Class		Ethnic Group	
		7-8	9-10	11-12	M	F	mid	low	black	white
	<u>N</u>	16	16	16	24	24	24	24	24	24
Object										
Assembly	<u>M</u>	-.58	.03	.55	.06	-.06	-.01	.01	-.26	.26
	<u>SD</u>	.87	1.14	.62	.95	1.06	.97	1.04	.92	1.03
Information										
	<u>M</u>	-.48	-.03	.51	.26	-.26	.17	-.17	-.55	.55
	<u>SD</u>	.85	.86	1.07	1.14	.77	1.12	.85	.68	.97
Block										
Design	<u>M</u>	-.35	-.07	.42	.01	-.01	.15	-.15	-.38	.38
	<u>SD</u>	.75	1.00	1.10	.80	1.18	1.04	.95	.90	.96
Role										
Taking	<u>M</u>	-.43	.18	.25	-.04	.04	.14	-.14	-.17	.17
	<u>SD</u>	.92	.88	1.03	1.04	.94	1.03	.93	1.02	.94

Table 2 (continued)

Means and Standard Deviations of Scores for Tests, Task Variables and Totals Within Age, Sex, Social Class, and Ethnic Group

		Age			Sex		Class		Ethnic Group	
		7-8	9-10	11-12	M	F	mid	low	black	white
	N	16	16	16	24	24	24	24	24	24
Nonrole Taking	M	-.51	.01	.49	.14	-.15	.06	-.06	-.39	.39
	SD	.75	.97	.98	1.00	.98	1.03	.95	.81	1.01
Human	M	-.55	.10	.45	.12	-.06	.14	-.14	-.27	.27
	SD	.81	.92	.98	1.06	.92	1.00	.99	.88	1.03
Nonhuman	M	-.38	.09	.29	-.01	-.01	.66	-.66	-.30	.30
	SD	.87	.95	1.04	.98	1.01	.89	1.07	.97	.93
Verbal	M	-.43	.09	.34	.07	-.07	-.14	-.14	-.30	.30
	SD	.94	.83	1.06	1.09	.89	.98	.99	.92	.97
Non-Verbal	M	-.50	.10	.40	.04	-.04	.06	-.06	-.26	.26
	SD	.73	1.03	.97	.95	1.04	.90	1.08	.87	.99
Total	M	-.47	.09	.37	.05	-.05	.10	-.10	-.28	.28
	SD	.83	.93	1.01	1.01	.96	1.04	.94	.93	.98

Note. All scores are standard scores derived from the raw scores.

which yielded fewer variables with more levels. In one analysis, for example, tests were treated as one variable: 3 (age) x 2 (sex) x 2 (social class) x 2 (ethnic group) x 8 (tests). In another, social class and ethnic group were combined, being treated as one variable with four levels instead of two variables with two levels each: 3 (age) x 2 (sex) x 4 (lower class, middle class, black, white) x 2 (point of view) x 2 (task content) x 2 (response modality). The interactions yielded included those between all the independent variables and any test variable, and between any two independent variables and all test variables. Thus, the main effects and interactions up to and including fifth-order interactions were evaluated for statistical significance. The effects of the independent variables on individual tests, total score and task variables were evaluated.

When the effect of the 3-level variable (age) proved to be statistically significant (see Table 3), the test for single main effects described by Winer (1971, pp. 529-530), which is a test for repeated measures on one factor, was used (see Table 4). The significant effects for age on a particular test were then (see Table 5) probed using the Scheffe method,

Table 3

Analysis of Variance for Effects of Age, Sex, Social Class, Ethnic Group, and Interactions

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Age	2	23.24	13.66**
Sex	1	1.05	.62
Social Class	1	4.07	2.39
Ethnic Group	1	30.44	17.88**
Subjects Within Groups	24	1.70	
Age x Point of View	2	1.52	1.67
Sex x Point of View	1	3.33	3.66
Social Class x Point of View	1	.63	.70
Ethnic Group x Point of View	1	4.41	4.85*
Point of View x Subjects Within Groups	24	.91	
Age x Task Content	2	1.13	1.64
Sex x Task Content	1	1.54	2.12
Social Class x Task Content	1	.53	.73
Ethnic Group x Task Content	1	.53	.73
Age x Social Class x Task Content	12	3.44	4.73*
Task Content x Subjects Within Groups	24	.77	
Age x Response Modality	2	.17	.21
Sex x Response Modality	1	.84	.11
Social Class x Response Modality	1	.16	.20
Ethnic Group x Response Modality	1	.61	.77
Response Modality x Subjects Within Groups	24	.79	
Social Class x Ethnic Group x Point of View x Task Content	1	3.41	5.58*
Point of View x Task Content x Subjects Within Groups	24	.61	

* $p \leq .05$
 ** $p \leq .01$

Table 4

Simple Effects Analysis of Variance for
Effects of Age on Tests

Test	<u>MS</u>	<u>df</u>	<u>F</u>
Role Taking Task	.75	2	11.68
Pantomime	7.70	2	17.07**
Communication Task	1.66	2	3.69*
Perceptual Role Taking	1.73	2	8.83*
Comprehension	5.0	2	11.05**
Object Assembly	5.16	2	11.43**
Information	3.93	2	8.70**
Block Design	2.43	2	5.38*
MS error	.4514	314	

* $\underline{p} \leq .05$
 ** $\underline{p} \leq .01$

Table 5

Scheffe's Test: Comparisons Among Ages

Test	Ages	<u>MS</u> Comparison	<u>F</u>
Pantomime	middle - youngest	5.98	13.25**
	oldest - middle	2.07	4.59
	oldest - youngest	15.07	33.39**
Communications Task	middle - youngest	2.15	4.76
	oldest - middle	.04	6.09*
	oldest - youngest	2.80	6.20*
Perceptual Role Taking	middle - youngest	3.45	7.64*
	oldest - middle	.72	1.60
	oldest - youngest	1.02	2.26
Comprehension	middle - youngest	4.09	9.06*
	oldest - middle	1.18	2.61
	oldest - youngest	9.66	21.04**
Object Assembly	middle - youngest	3.02	6.69*
	oldest - middle	2.16	4.79
	oldest - youngest	10.29	22.80**
Information	middle - youngest	1.00	2.54
	oldest - middle	2.35	5.21
	oldest - youngest	7.86	17.48**
Block Design	middle - youngest	.61	1.35
	oldest - middle	1.95	4.32
	oldest - youngest	4.73	10.48**

Note. MS error was .4514, the error term for the analysis of simple effects. F was evaluated against $F(2, 314) \times 2$. Youngest refers to ages 7-8, middle to ages 9-10, and oldest to ages 11-12.

* $p < .05$
 ** $p < .01$

the error term being taken from the test for simple main effects with $F^1 = F(2, 314) \times 2$ used to evaluate the significance. Significant effects of 2-level variables on individual tests were evaluated using a two-tailed t test (see Table 6).

Results

It was hypothesized that older subject score significantly higher than younger subjects on all tests and total score. This was found to be the case for total score (see Tables 2 and 3). The effects of age on total score were highly significant, $F(2, 24) = 13.66$, $p < .01$. The means for total scores were from younger to older, $-.47, .09, .37$. The effects of age on the following tests were significant at the .05 level or higher, $F(2, 314)$: pantomime, communication, perceptual role taking, Comprehension, Object Assembly, Information and Block Design (see Table 4).

On those tests significantly affected by age (see Tables 2 and 5), the following specific age comparisons were significant at the .05 or .01 level: for pantomime, middle and youngest (means = .12 and $-.75$), and oldest and youngest (means = .63 and $-.75$); for communication task, oldest and youngest (means = .22 and $-.37$); for perceptual role taking, middle and

Table 6

Two-Tailed t Test for Differences Between
Test Means as a Function of Ethnic Group

Test	$M_1 - M_2^a$
Role Taking Task	.32
Pantomime	.56
Communications	.27
Perceptual Role Taking	.25
Comprehension	.72*
Object Assembly	.52
Information	1.11**
Block Design	.76*

^aFor t , $df = 46$, the critical value for $p < .05$ is $M_1 - M_2 = .68$ and for $p < .01$ the critical value is $M_1 - M_2 = .78$.

* $p < .05$
 ** $p < .01$

youngest (mean = .32 and -.34); for Comprehension, middle and youngest (means = .11 and -.61), and oldest and youngest (means = .49 and -.61); for Object Assembly, middle and youngest (means = .03 and -.58), and oldest and youngest (means = .55 and -.58); for Information, oldest and youngest (means = .51 and -.48); and for Block Design, oldest and youngest (means = .42 and -.37).

It was hypothesized that boys do significantly better than girls on perceptual role taking. The hypothesis was not confirmed. There were no significant effects of sex (see Table 3).

It was hypothesized that total score and individual test scores are significantly higher for middle-class than for lower-class children. This hypothesis was not confirmed. There were no statistically significant effects of social class on total score or individual tests (see Table 3).

It was hypothesized that the verbal scores of middle-class children minus the verbal scores of lower-class children is significantly greater than the non-verbal scores of middle-class children minus the non-verbal scores of lower-class children. The effect of social class on response modality was not statisti-

cally significant (see Table 3), and the hypothesis was not supported.

It was hypothesized that black subjects score significantly lower than white subjects on all eight tests and total score. This hypothesis was born out for the effects of ethnic group on total score, with a mean for black subjects of $-.28$ and a mean for white subjects of $.28$, and $F(1, 24) = 17.88, p = < .01$. (See Tables 3 and 6.) For the sake of simplicity, the difference between the means was evaluated against the critical values $\bar{M}_1 - \bar{M}_2 \geq .68$ yielding $p < .05$, and $\bar{M}_1 - \bar{M}_2 \geq .78$ yielding $p < .01$. (The t value with 46 df for $p < .05$ is 2.02, and for $p < .01$ it is 2.70.)

The following tests were significantly affected by ethnic group at the .05 or .01 level: Comprehension, with a mean for black subjects of $-.37$, for white subjects $.37$; Information, with a mean for black subjects of $-.55$, for white subjects $.55$; and Block Design, with a mean for black subjects of $-.38$, for white subjects $.38$.

Finally, it was hypothesized that the nonverbal scores for white minus the nonverbal scores for blacks is significantly greater than the verbal scores for whites minus the verbal scores for blacks. The ethnic

group x response modality interaction was not statistically significant (see Table 3). Thus, this hypothesis was not supported.

Three relationships between independent and dependent which had not been hypothesized were statistically significant (see Table 3). They were ethnic group x point of view, $F(1, 24) = 4.85, p < .05$; age x social class x task content, $F(2, 24) = 4.73, p < .05$; and social class x ethnic group x point of view x task content, $F(1, 24) = 5.58, p < .05$. For the ethnic group x point of view interaction, the difference between the ethnic groups was smaller for tasks which involved role taking. Whites consistently scored higher than blacks on role-taking and nonrole-taking tasks, but the differences were most pronounced for nonrole-taking tasks. The means for whites were .17 and .39 for role taking and nonrole taking, respectively, while the means for blacks were -.17 and -.39, respectively. For the age x social class x task content interaction, at the ages of 9 and 10, lower-class subjects scored higher (.21) on tasks with human content than did middle-class children (-.02); and between the ages of 9-10 and 11-12, the subjects' scores did not improve. For the social class x ethnic group

x point of view x task content interaction, the pattern of scores was the same for white middle-class subjects and black lower-class subjects (nonrole taking human = $-.09$, role taking human = $.09$, nonrole taking nonhuman = $.09$, and role taking nonhuman = $.09$), while the pattern of scores was the same for white lower-class subjects and black middle-class subjects (the signs are just changed from those of the first group).

While no hypotheses were made regarding the correlations among the tests, the author decided to do a Pearson product-moment correlation analysis of the test results (see Table 7) to see whether any patterns emerged upon inspection. It might have been hypothesized, for example, that tests with two features in common correlate more highly than tests with no features in common, features referring to values on the task variables. Nonrole-taking measures from the Wechsler Intelligence Scale for Children correlated moderately and significantly among themselves; however, as a whole, the measures of role taking did not correlate significantly among themselves. The perceptual role-taking task correlated significantly with Object Assembly and Block Design ($r_s = .34$ and $.46$)

Table 7
Correlations Among Tests

	Role Taking	Panto- mime	Communi- cation	Percep- tual	Compre- hension	Object Assembly	Infor- mation
Panto- mime	.09						
Communi- cation	.27	-.05					
Percep- tual	.24	.13	.33*				
Compre- hension	-.03	.59**	-.01	.15			
Object Assembly	.11	.43**	.25	.34*	.34*		
Infor- mation	.21	.62*	.17	.25	.62**	.32*	
Block Design	.15	.36*	.28	.46**	.36*	.41*	.60**

* $p < .05$
 ** $p < .01$

and with the Krauss and Glucksberg communication task ($\underline{r} = .33$). Finally, the pantomime task correlated moderately with tasks of nonrole taking but not significantly with role-taking tasks.

CHAPTER IV

DISCUSSION

It was hypothesized that older children score significantly higher than younger children on all subtests and total score. This hypothesis was supported for all except the Role Taking Task. The latter result is inconsistent with most results reported in the literature. Feffer and Gourevitch (1960), Turnine (1975) and Sullivan and Hunt (1967) all found that performance on the Role Taking Task improved with age, while only Hollos and Cowan (1973) did not. One possible explanation for the different results is that Hollos and Cowan (1973) studied Norwegian children, suggesting that age has a more significant effect upon the Role Taking Task in some cultures than in others. If age affects performance on the Role Taking Task differently in different subcultures in the United States, that might explain the absence of significant age effects in the present study, since half the subjects were black.

It was hypothesized that boys score higher than girls on the perceptual role-taking task. This hypothesis was not supported. The result is not surprising in view of the general lack of statistically significant

differences between performance of boys and girls on measures of intelligence. Further, significant differences between boys and girls were found by Coie and Dorval (1973) on only one of two tasks involving perceptual role taking.

Four hypotheses concerned the effects of the social variables of social class and ethnic group on the tests. Only one of those, that whites score significantly higher than blacks on all tests and total score, received even partial support. It was found that whites score significantly higher than blacks on Comprehension, Information and Block Design. Differences were not significant for Object Assembly or any of the role-taking tasks. The present study thus confirmed in the main the well documented finding that whites score higher than blacks on measures of abstract intelligence. The finding of no significant differences on individual measures of role taking is consistent with a notion that measures of role taking are less affected by ethnic group differences than are measures of abstract intelligence or that they are less culturally biased. The other well established hypothesis not confirmed in the present study was that middle-class children score significantly higher than lower-class children on all sub-

tests and total score. I know of no studies which would lead one to expect no class differences on measures of abstract intelligence. Perhaps it might be noted that Estes (1953) found only small differences between middle-class and lower-class children on the subtests of the Wechsler Intelligence Scale for Children. The hypothesis that verbal scores for middle-class children minus verbal scores for lower-class children is significantly greater than nonverbal scores for middle-class children minus nonverbal scores for lower-class children was not confirmed. This result has not been reported as consistently in the literature as has the main effect of social class. The interaction between social class and the verbal-nonverbal distinction has not been reported with such consistency in the literature as has the main effect of social class. Thus the nonsignificant interaction between the two variables in the present study does present a serious problem to be explained. The same can be said of the lack of confirmation of the hypothesis that nonverbal scores for white children minus nonverbal scores for black children is significantly greater than verbal scores for white children minus nonverbal scores for black children.

The present study yielded three statistically significant results which had not been hypothesized. The first, the ethnic group x point of view interaction, seems to be simple enough to be interpretable and to have significant theoretical implications. The finding was that blacks differ from whites significantly less on role-taking tasks than they do on nonrole-taking tasks. This may mean either that ethnic group affects role-taking skills considerably less than traditional measures of abstract intelligence or that role-taking tasks are less culturally biased than traditional tests of abstract intelligence. The former interpretation would be more reasonable if it could be shown that role-taking tasks measure significant social interaction skills, the latter if it could be shown that performance on role-taking tasks correlates as highly with academic and nonacademic achievements as do traditional measures of abstract intelligence. The second and third statistically significant interactions are more difficult to interpret. Among subjects ages 9-10, lower-class children scored higher than middle-class children on tasks with human content. White middle-class children had the same pattern of scores on the point of view and task content variables as did lower-class blacks, while middle-

class blacks and lower-class whites had the same pattern. Perhaps all that can be said is that there may be complex interactions between the social variables of social class and ethnic group and measures of social and abstract intelligence which have yet to be investigated.

In sum, then, the most significant result of the present study, from a theoretical point of view, was that the difference between blacks and whites was considerably less on measures of role taking than nonrole taking.

Nonsignificant results bearing on hypotheses about differential effects of social class on tests and the verbal-nonverbal distinction, as well as the nonsignificant effect of ethnic group on the verbal-nonverbal distinction, require further investigation. Those results may be due to methodological factors, such as the choice of measures or the nature of the population.

Regarding the test battery itself, the following might be said: (a) the pantomime task is not a measure of role-taking ability but rather of abstract intelligence, since it correlates highly with measures of abstract intelligence and not with measures of role taking; (b) measures of nonrole taking correlate significantly among themselves, as would be expected, while measures of role taking do not, thus throwing into question whether in fact the measures of role taking used here mea-

sure role taking, assuming that is indeed a valid construct; (c) indeed, only communication and perceptual role taking correlated significantly among the measures of role taking, while perceptual role taking correlated significantly with Object Assembly and Block Design, suggesting that the verbal-nonverbal task variable may account for more variance than the role taking-nonrole taking variable, and (d) there is nothing from the intercorrelations or effects of the independent variables to suggest that the human-nonhuman distinction has any validity for the present study.

The results of the present study, some of which show theoretical promise and some of which do not support well established facts in psychology, require further research if they are to be clarified. The following changes in the design of the study might lead to that clarification: (a) the pantomime task should be dropped from the battery; (b) since the human-nonhuman distinction does not seem useful in the present study, it should be dropped, leaving the subtests of the Wechsler Intelligence Scale for Children in their original form; (c) the battery might be reduced from eight to four subtests, one measuring role taking-verbal, one measuring role taking-nonverbal, one measuring nonrole taking-ver-

bal and one measuring nonrole taking-nonverbal, thus allowing fuller use of the tests; (d) the age of the children be confined to a single age, since little is to be gained by exploring further the age variable; (e) that the variable of sex be eliminated, but still taking equal numbers of children from each category; (f) the social class of parents be confined to very limited ranges within the occupational strata so that there would be maximal differences between the samples from the different classes and so that the class position of the different ethnic groups would be equivalent, and (g) that the number of children in each category be increased.

REFERENCE NOTES

1. Schnall, M. & Feffer, M. Role-Taking Task:
Scoring Criteria. Unpublished manuscript, 1958.
(Order Document No. 5844, Microfilm Publications,
305 East 46th Street, New York, New York 10017.)

REFERENCES

- Alvy, K. T. Relation of age to children's egocentric and cooperative communication. Journal of Genetic Psychology, 1968, 112, 275-286.
- Bellak, L., Bellak, S. S., Haworth, M. R., & Hurvich, M. S. Children's apperception test (human figures). Larchmont, N.Y.: C. P. S., Inc., 1965.
- Borke, H. Interpersonal perception of young children: egocentrism or empathy? Developmental Psychology, 1971, 5, 263-269.
- Bowers, P. & London, P. Developmental correlates of role-playing ability. Child Development, 1965, 36, 499-508.
- Butcher, H. J. Human intelligence: Its nature and assessment. London: Methuen & Co., 1968.
- Chaplin, M. V. & Keller, H. R. Decentering and social interaction. Journal of Genetic Psychology, 1974, 124, 269-274.
- Coie, J. D. & Dorval, B. Sex differences in the intellectual structure of social interaction skills. Developmental Psychology, 1973, 9, 261-267.

- Coleman, R. P. Social class in Kansas City. Unpublished doctoral dissertation, University of Chicago, 1959.
- DeVries, R. Relationships among Piagetian, IQ, and achievement assessments. Child Development, 1974, 45, 746-756.
- Dubois, P. H. A history of psychological testing. Boston: Allyn & Bacon, 1970.
- Dunn, W. L. Visual discrimination of schizophrenic subjects as a function of stimulus meaning. Journal of Personality, 1954, 23, 48-64.
- Eells, K., Davis, A., Havinghurst, R. J., Herrick, V.E., & Tyler, R. W. Intelligence and cultural differences. Chicago: University of Chicago Press, 1951.
- Estes, B. W. Influence of socioeconomic status on the Wechsler Intelligence Scale for Children: An exploratory study. Journal of Consulting Psychology, 1953, 17, 58-62.
- Feffer, M. & Gourevitch, V. Cognitive aspects of role-taking in children. Journal of Personality, 1960, 28, 384-396.

- Fiske, D. W. Measuring the concepts of personality.
Chicago: Aldine Publishing Co., 1971.
- Fitzgerald, H. E. & McKenney, J. P. (Eds.). Developmental psychology: Studies in human development.
Homewood, Ill.: The Dorsey Press, 1970.
- Flavell, J. H., Botkin, P. J., Fry, C. L., Wright, J. W.,
& Jarvis, P. E. The development of role-taking
and communication skills in children. New York:
John Wiley, 1968.
- Glucksberg, S. & Krauss, R. M. What do people say
after they have learned how to talk? Studies of
the development of referential communication.
Merrill-Palmer Quarterly, 1967, 13, 309-316.
- Guilford, J. P. & Hoepfner, R. The analysis of intelligence. New York: McGraw-Hill, 1971.
- Harding, J., Proshansky, H., Kutner, B., & Chein, I.
Prejudice and ethnic relations. In G. Lindzey &
E. Aronson (Eds.), The handbook of social psychology
(Vol. 5, 2nd ed.). Reading, Mass.: Addison-Wesley,
1969.
- Hollos, M. & Cowan, P. A. Social isolation and cognitive
development: Logical operations and role-
taking abilities in three Norwegian social settings.
Child Development, 1969, 40, 245-254.

- Krauss, R. M. & Glucksberg, S. The development of communication competence as a function of age. Child Development, 1969, 40, 255-266.
- Lesser, G. S., Fifer, G., & Clark, D. R. Mental abilities of children from different social-class and cultural groups. Monographs of the Society for Research in Child Development, 1965, 30.
- Matarazzo, J. D. Wechsler's measurement and appraisal of adult intelligence. Baltimore: Williams & Wilkins, 1972.
- Peterson, C. L., Denner, F. W., & Flavell, J. H. Developmental changes in children's response to three indications of communicative failure. Child Development, 1972, 43, 1463-1468.
- Piaget, J. The language and thought of the child. New York: Meridian, 1955.
- Pozner, J. & Saltz, E. Social class, conditional communication, and egocentric speech. Developmental Psychology, 1974, 10, 764-771.
- Quereshi, M. Y. Factorial patterns of the WISC at ages six, ten and fourteen. Proceedings of the 80th Annual Convention of the American Psychological Association, 1972, 53-54.

- Quereshi, M. Y. Patterns of intellectual development during childhood and adolescence. Genetic Psychology Monographs, 1973, 87, 313-344.
- Reese, H. W. & Lipsitt, L. P. Experimental child psychology. New York: Academic Press, 1970.
- Rubin, K. H. Egocentrism in childhood: A unitary construct? Child Development, 1973, 44, 102-110.
- Selman, R. L. Conceptual role-taking development in early childhood. Proceedings of the 79th Annual Convention of the American Psychological Association, 1971, 155-156.
- Selman, R. L. & Byrne, D. F. Structural-developmental analysis of Levels of role taking in middle childhood. Child Development, 1974, 45, 803-806.
- Shanley, L. A., Walker, R. E., & Foley, J. M. Social intelligence: A concept in search of data. Psychological Reports, 1971, 29, 1123-1132.
- Shuey, A. M. The testing of negro intelligence. New York: Social Science Press, 1966.
- Stephens, B., McLaughlin, J. A., Miller, C. K., & Glass, G. V. Factorial structure of selected psycho-educational measures and Piagetian reasoning assessments. Developmental Psychology, 1972, 6, 343-348.

- Sullivan, E. V. & Hunt, D. E. Interpersonal and objective decentering as a function of age and social class. The Journal of Genetic Psychology, 1967, 110, 100-210.
- Thorndike, E. L. Intelligence and its use. Harper's Magazine, 1920, 140, 227-235.
- Turnine, C. Cognitive development and role-taking ability in boys and girls from 7 to 12. Developmental Psychology, 1975, 11, 202-209.
- Walker, R. E. & Foley, J. M. Social intelligence: Its history and measurement. Psychological Reports, 1973, 33, 839-864.
- Wechsler, D. Wechsler intelligence scale for children: Manual. New York: The Psychological Corporation, 1949.
- Whiteman, M. The performance of schizophrenics on social concepts. Journal of Abnormal and Social Psychology, 1954, 49, 266-271.
- Winer, B. J. Statistical principles in experimental design (2nd ed.). New York: McGraw-Hill, 1971.

Appendix A: Supporting Materials

Appendix A: Supporting Materials

Order of Presentation for Tests

The individual tests were arranged in eight orders (see Table A) so that no test followed any other test more than once in a given set of eight tests. The tests were not assigned to the subjects in any systematic manner.

Table A

Order of Presentation for Tests

<u>Subject</u>	<u>Order</u>
1	1 2 8 3 7 4 6 5
2	2 3 1 4 8 5 7 6
3	3 4 2 5 1 6 8 7
4	4 5 3 6 2 7 1 8
5	5 6 4 7 3 8 2 1
6	6 7 5 8 4 1 3 2
7	7 8 6 1 5 2 4 3
8	8 1 7 2 6 3 5 4

Additional Materials about Individual Tests

Role Taking Task. The directions of administration were written on each test protocol as were the instructions to tape the stories. The directions were as follows:

"This is a test of imagination, and your task will

be to make up as dramatic a story as you can for each picture. Tell what led up to the event shown in the picture, describe what is happening at the moment, what the characters are feeling, and then give the outcome."

(Go through both pictures. Once, on the first card, it is permissible to ask how the story turns out or how the characters are feeling.)

"Now you are going to see the same pictures, but this time make believe that you are this person (E points to the first actor mentioned by the subject in his initial story) and that you are right in the situation. Retell the story from the point of view of this person. That is, tell the story again, but as though you were really this person. (After subject has completed his story from that actor's point of view, examiner points to the third actor mentioned in the initial story.) This time, tell the story as though you were this person."

The same procedure is used for each initial story.

The stories were written and simultaneously taped as they were told. The recording was played back later so that the initial transcription could be corrected. The stories were scored according to the criteria in Schall and Feffer (Note 1).

Pantomime. The pantomime test is an adaptation of Flavell's acting test (Flavell et al., 1968). The instructions were revised several times to reach the final form:

Now, I want you to do a little acting, like you were in a play. In other words, I want you to

pretend. Only I want you to just use your body. No words. Do you understand? (If not, then explain again.)

Let's practice first. Let's pretend you're a little boy (girl) who really likes ice cream. (E gets up.) You hand me the money, and I'll give you the ice cream, and you start to eat it. (Feel free up to this point to encourage the child in any way that seems helpful to help him relax or become involved.)

(From this point, read the instructions verbatim. If the child begins to talk, quiet him with finger to lips.)

Shy. OK, this is the real thing. I'm going to play the teacher and you are to play the part of a little boy (girl), say, in the first grade. You have just returned from a trip to the zoo, and I, the teacher, am going to ask you about it. Now, I want you to play the part of a very special kind of little boy (girl). This little boy (girl) is very shy. He (She) doesn't like to be in front of the class. He (She) is very uncomfortable, may be even a little scared. I want you to act just like him (her). Remember, no words. I'm the teacher, and I say, "_____, what happened at the zoo today?"

Score: _____

Bold. OK. Same situation again. You are a first grade boy (girl) who has just come back from the zoo. But this time you are a very different kind of little boy (girl). You are not shy at all. You are very bold. You like to show off. You like to be in front of the class. I want you to act just like this kind of little boy (girl). I'm the teacher and I say, "_____, what happened at the zoo today?"

Score: _____

(The score should be based on the first 5-15 seconds after the question.)

0--no change in behavior, or it is impossible to tell because of irrelevant behavior.

- 1--some change in behavior in response to question, but impossible to say whether it is bold or shy.
- 2--minimal appropriate behavior, bold or shy.
- 3--clearly bold or shy. One dramatic gesture, or several minimal ones.
- 4--excellent portrayal of the role. At least two dramatic gestures.

After some experience with the task, it became apparent to me that standing up and acting was indeed quite frightening to many children, and many of them were at a loss as to how to begin. I introduced the practice scene between the child and the ice cream man in an attempt to deal with both those problems: 1) I reasoned that practicing with the examiner would make the task much less threatening, and 2) acting out a familiar scene with another person, one which did not involve character portrayal, would get the child acting without influencing unduly his grasp of the shy and bold characters.

The summaries of the scores were simply reminders. All examiners had studied the more elaborate criteria given below, and they had established interrater reliabilities with me.

The following behavior was defined as shy: head down, looking out of corner of eyes, hugging body or clasping hands, shrugging shoulders, side-to-side movements, moving backwards, withdrawing. The following be-

havior was defined as bold: head up, looking around, movement forward, forward and backward movement, expansive arm gestures, possibly imitating animals. Scoring: (The nonstandard English is a reproduction of the original.)

0--either no change in behavior in response to question, or behavior (and words) indicating no relevance to the question. Examples of 0 score: Child is wandering around the room picking up things and continues to do so when asked question. Child stands smiling and continues to do so. When asked the question, child seems to alter position, but says, "I lost my zoo." 1--child alters behavior in response to question, but the change cannot be identified as bold or shy. (In doubtful cases, where there appears to be a change in behavior, spontaneous verbalizations may be considered to distinguish 1 from 0. Cf. example above.) Example: In response to question, child turns head slightly, saying aloud, "I don't know what we did at the zoo today." 2--child makes one or more minimal but appropriate gestures. Examples: When asked to act bold, child moves head around, moving mouth vigorously, but is otherwise immobile. When asked to play shy, child looks out of corner of eyes and shrugs slightly. 3--there is no doubt that the

child is acting bold or shy; he makes one dramatic gesture or several minimal ones. Examples: When asked to play shy, child listens to questions and shrugs vigorously. To play shy, child looks back and forth out of the corners of his eyes; as he does so, he clasps his hands in front of him. 4--child performs excellently, giving at least two dramatic gestures. Examples: Child steps back, shrugs, and looks from side to side, head down. Child pretends to walk along looking in what are probably cages, smiles up at something, and imitates an elephant.

Communication. The directions for the Krauss and Glucksberg Communication Task were as follows:

Krauss and Glucksberg Communication Task (Tape record and also write down). E and S are separated by a screen. S has a pile of cards face down in front of him. E has six cards spread out in front of him.

Say, to S, "We have identical sets of cards. The idea of this game is for us to match as many of our cards together as possible. However, since you cannot see my cards and I cannot see yours, the only way we can match them is if you tell me all you possibly can about your cards. Take the first card and tell me all you possibly can about it." At the end of the card say, "I don't understand which you mean. Can you tell me more about it?" (The wording of the question can be varied slightly.) When S has finished, say, "Now go on to the second. Tell me all you possibly can about it." When S has finished, say, "I don't understand which card you mean. Can you tell me more about it?" Repeat the procedure for the rest of the cards, recording the responses below.

The drawings were traced from the original drawings reproduced in Krauss and Glucksberg (1969) and then drawn over with a felt-tip pen.

The score for each subject was the sum of the scores for each of the six figures. The scores for each figure was the sum of the scores for amount of information and modification of the message following negative feedback. ("I don't know which one you mean. Can you tell me more about it?") None of the published accounts, as far as I know, had described the scoring criteria in detail so I worked out the following definitions: the amount of information or distinctive features refers to pieces of information which might help to identify designs or distinguish them from other designs in the task. This can either be information about a new aspect of the design or a different way of describing it. (Design 6: Looks like a lemon; there's a tail coming down; looks like a submarine -- three pieces of information.) The separate scorable units of information must be able to stand alone (Score 2 for response to design 1: Looks like a shirt with a waist line at the bottom.) An elaboration of the concept rather than a description of the design receives a score of 1 (Looks like a shirt you would wear to a party, would buy in a



fancy store.) The same applied to elaborate definitions (Looks like a mythical horse with a horn on his nose, score 1). Rather arbitrarily I decided not to score positions (The propeller goes down from the boat). A series of negative specifications was scored 1 (Looks like a dog's face without ears, eyes and teeth, score 2).

Perceptual Role Taking. This was measured by Flavell's adaptation of Piaget's Mountain Task (Flavell et al., 1968, task IID, p. 147). The displays were constructed, administered and scored according to Flavell's specifications (Flavell et al., 1968), with the exception that there was only one examiner and he changed positions. The instructions were as follows:

Shift of perspective (record actual productions by tracing on paper.)

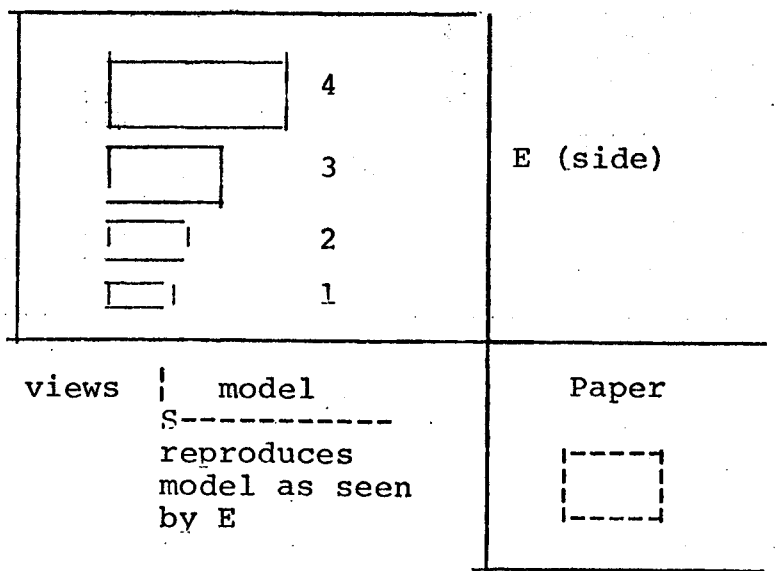
E is seated initially at the side position. He places the display (1) in its proper orientation and lays its duplicate down on top of a half sheet of paper on the table to S's right. He says, "Now I'm going to sit here and look at the block(s) very hard. I'm going to give you some directions about what to do with your block(s) and I'd like you to say them back to me in your own words -- before you actually play the game. Now you take your block(s) and put it (them) on the paper here (S's table) so it (they) looks (look) to you here just like that block looks to me here -- so that you see on your block(s) just what I see on my block(s)." E should indicate the blocks as he talks. "Now say it back to me in your own words." If the child doesn't understand, repeat the in-

structions and have him repeat them in his own words. Then say, "Go ahead, put the block here (S points) so it looks to you just like that block looks to me, so you see on your block(s) just what I see on my block(s)." If S makes a mistake, have him walk over to E's position, saying, "See what I see from over here." If he still does it wrong, E does it for him, explaining why it is correct. E then moves to a position opposite and says, "Now I'm sitting in a different place and I'm looking at my block(s) from this place. Put your block(s) on the paper so it (they) looks (look) to you just like this block looks to me." If the child passes the first trial and fails the second on the first try, he can go over to E's position.

If S passes display 1, he goes on to display 2, first side position, then opposite. Each time, say, "Put your block on the paper so it looks to you just like this block looks to me." If S's responses to both subtasks of a given display are not even approximately correct, discontinue.

1-1__1-2__2-1__2-2__3-1__3-2__4-1__4-2__

E (opposite)



There were four stimulus displays: 1) a blue block 6" x 6" x 4" x 1", in other words a block with one end higher than the other. 2) three 4" sections of 1" dowels painted blue and glued to a base in the arrangement shown above. 3) three lengths of 1" dowel of 2" (L), 4" (M) and 6" (H) painted blue and glued to a base in the arrangement shown above. 4) three lengths of 1" dowel of 2", 4" and 6", half red and half white as shown above and glued to a base as shown above. When each task started, matching blocks not glued to a base were laid down on the paper.

Comprehension, Object Assembly, Information, Block Design. These tasks were administered according to standard instructions (Wechsler, 1949), with the exception that the Block Design was given to all subjects irrespective of their age, in its entirety. Examiners were instructed to record all responses in full detail, especially doubtful ones. Only the first three designs of the Object Assembly were given, since the fourth was nonhuman in content.

APPROVAL SHEET

The thesis submitted by William P. Bryant
has been read and approved by the following committee:

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The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

May 17, 1976
Date

James E. Johnson
Director's Signature