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A MEASURE OF CHILDREN'S REASONING ABOUT INTERPERSONAL RELATIONS

by

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APPROVAL SHEET

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The problem investigated in this research was the development, pretesting, and validation of a measure of children's reasoning about interpersonal relations. The test was developed for children from six to ten years of age. Reasoning was operationally defined in the study through hypothetical syllogisms which had a content of interpersonal relations. The content of these items was not that drawn from traditional examples in logic, but the content was empirically derived from the conversations of children in the age range under study.

During the development of the reasoning test one hundred fifteen items were written. The form of the item was that of the traditional syllogism consisting of major premise, minor premise, and conclusion. Two alternatives were presented to the child as conclusions. The child's task was to indicate the correct conclusion.

The research measure was pretested on a group of thirty-six children. Item-test correlations were computed and plotted against mean scores for each of the one hundred fifteen items. Thirty-six items had item-test correlations between .40 and .80 and difficulty levels of three to seven children out of nine passing the item. Thirty items from among these thirty-six items composed the test of reasoning about interpersonal relations.

The reasoning test was administered to a population of one hundred six children in grades one through four. The individual interview technique developed with the pretest was used as the standard procedure. Validity was evaluated in terms of correlation and lack of correlation with Primary Mental Abilities, Form 2-4, Revised 1962, and correlation and lack of correlation with teachers' ranks.

Product-moment correlations were computed for a 75 x 75 matrix including the variables of odd score, even score, total score on reasoning test, age, grade, sex, five PMA test scores, proportion of items passed on which the child disagreed with the major premise, number of disagreed premises, teachers' ranks, deviations from grade means, thirty item scores on the reasoning test, and thirty item scores for agreement-disagreement with the premises.

Certain intercorrelations for 75 variables were studied. Odd-even split-half reliability obtained was .48, corrected to a .65. A correlation of .57 was obtained between the reasoning test and the PMA, Form 2-4. The highest PMA test score and reasoning test score correlations were with the verbal and number tests where the correlation was .52 in both cases. The correlation between teachers' ranks and deviations from grade means on the reasoning test was -.45. This negative correlation was in the expected direction due to the manner of assigning ranks.

The relation between sex and the reasoning test was a negative correlation of -.12, males having lower scores.

Age and scores on the reasoning test were correlated by a relationship of .38. The correlation between grade and the reasoning test score was .45; this was higher than the age correlation with the reasoning test.

Two minor hypotheses were examined: (1) that there is a positive correlation between age and passing an item on which the subject disagrees with the major premise and (2) that there is a positive correlation between age and number of disagreed premises. The magnitude of the relation for the first hypothesis was .27, for the second -.01.

Inspection of grade means indicated that only between grades one and two was there any noticeable difference in score. The difference was three points.

All of the items in the test were positively correlated with the total score; the range of these correlations was from .04 to .55. The correlations between age and item scores and grade and item scores were similar. Only six item premises were accepted by fewer than 75 per cent of the children. Two premises were accepted by all of the children.

The conclusions were: (1) that the measure of reasoning about interpersonal relations developed in this research had a moderate level of reliability; (2) that the test of reasoning had a moderate degree of validity with the PMA and teachers' ranks; (3) that higher correlations throughout between grade and other variables, rather than age and other variables, suggested the ability to reason about interpersonal

relations was related to experience as well as maturation; (4) that the low positive correlation between age and proportion of items passed, where there was disagreement with the premise, provided some support for the hypothesis of increasing hypothetical reasoning ability with age; and (5) that there was no support for the hypothesis that number of disagreed premises will increase with age.

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CHAPTER I

THE PROBLEM AND A REVIEW OF RELATED LITERATURE

Man's chief claim to ascendancy over other forms of animal life has usually been acknowledged as his cognitive superiority. Man has been able to harness the atom through the use of his intelligence. The constant clamor concerning man's inability to deal in his interpersonal relationships at a level commensurate with his advancement in other endeavors suggests this as an area to which the scientist of human behavior and development can well turn his attention. Little is known about the relationship between the cognitive ability of reasoning and the area of personality labeled interpersonal relations; no effort has been made to quantify this particular relation. Several useful measures are available for making evaluations of a child's readiness for entry into school and his progress in various content areas of the school curriculum. A measure of the child's reasoning about interpersonal relations would appear to be a desirable addition to methodology and content in child development.

The Problem

The problem investigated in this research was the development of a measure of the reasoning of six to ten year old children about interpersonal relations. The study fo-

cused upon the relationship between two important areas of psychological and developmental interest, cognitive processes and personality. The cognitive process of reasoning was studied as it was applied to the area of content in personality labeled interpersonal relations. The approach to the problem was measurement or quantification. A test was developed in which reasoning was operationally defined through items structured as hypothetical syllogisms having as their content interpersonal relations.

Review of The Literature

The literature which was reviewed was concerned with the manner in which reasoning had been operationally defined, the content areas in which children's concepts had been studied, and relevant theoretical formulations of mental measurement and cognitive development.

The manner in which reasoning has been operationally defined

Reasoning has been studied at length. In the preschool child reasoning has been operationally defined most often as a problem solving task. A tool was made available with which the problem could be solved. Tools included strings, sticks, boxes, levers, and pulleys (Harter, 1930; Matheson, 1931; Richardson, 1934; Sobel, 1939). Puzzle problems have often been used to study problem solving (Bradbury, 1933; Mather & Kline, 1922; Shakow & Kent, 1925).

The reasoning task has also been operationally defined as abstracting a principle which involved matching designs

(Long & Welch, 1941); performing a series of operations which would secure an object for the subject (Heidbreder, 1928) or open a door (Graham, Jackson, Long, & Welch, 1944).

With the increasing age of the subjects the study of reasoning moved into areas where there were pictorial representations or word representations as stimuli and the task was to indicate the analogy (Chen, 1937a; Chen, 1937b; Mann, 1939; Stempel, 1953). Picture and number series for which the subject must supply a missing number or picture were frequently the reasoning task. These tasks continue to be a common form in standardized tests of ability (Kidd, 1962; Mann, 1939). Free response to a pictorial representation has also been used to study reasoning (Alexander, 1952; Yamamoto, 1962).

The discovery of a principle through watching a demonstration or by performing one has been a frequent choice as the task in studies of logical thinking where the content of the task involved concepts of mechanical, mathematical, or physical science nature (Deutsche, 1937; Ervin, 1960; Inhëlder & Piaget, 1958; Peterson, 1932). Smedslund (1964) studied concrete reasoning by demonstrating two events with cardboard, linoleum, tubes, or sticks; removing the perceptual items and requesting the subject for a conclusion using the two pieces of information presented. His definition of reasoning was very similar to that used in this research. The content was perceptual in nature.

In some investigations both the stimuli and the response representing reasoning have been completely verbal, either oral or written. Free response to questions or problem situations posed by the experimenter has been used extensively by some investigators where the content of the problem was primarily physical-mechanical in nature (Duncker, 1926; Piaget, 1930). Piaget's early work on judgment and reasoning used this free response approach and some of the content involved interpersonal relations (1926, 1928, 1932). There have been numerous replications and extensions of his work utilizing a more structured form of response. These replications were not primarily studies of interpersonal content (Flavell, 1963).

The syllogistic form of logic has been used in the study of the reasoning of children. The content of one reported instance was heathen gods; such content appeared removed from the interests of children (Werner 1948, p. 23). Burt (1919) used the syllogistic form in mental test items. Piaget in his research (1928, p. 62) utilized Burt's syllogism which required a conclusion stating who had the darkest skin color.

These studies are representative of the vast number of ways in which reasoning has been operationally defined. The application of reasoning to the content of interpersonal relations has seldom been the subject of research; most often reasoning has been studied in terms of perceptual, mechanical, physical, or scientific content.

Content areas of children's concepts

Concepts held by individuals appear to be what constitute their premises and have an important relation to their reasoning (Henle & Michael, 1956; Janis, 1943; Lefford, 1946; Schuessler & Strauss, 1951). There is an extensive literature on concept formation and development in children. Some of this work deals with areas of interpersonal relations such as ethnic group membership, prejudice, and role perception (Hartley & Krugman, 1948; Hartley, Rosenbaum, & Schwartz, 1948; Zeligs, 1950). There is no lack of interest in interpersonal relations, or even in the relation of cognition to interpersonal relations. One of the chief difficulties thus far in studies relating cognition to interpersonal relations has been the difficulty of operationally conceptualizing the variables so that they do not remain at global levels and so that they clearly indicate the cognitive process being studied and the content on which the process is operating (Grinder, 1964). There are several conceptualized cognitive processes, including reasoning, judgment, imagining, and perception. The content areas covered by the term interpersonal relations are vast. Thus far researchers have experienced some difficulty in clearly pointing out to each other exactly with what explicit variables they are attempting to deal; problems of semantics remain important in the task of conceptualization.

Theoretical formulations

Theoretical formulations involving quantification of ability and theories of cognitive development had relevance for this research.

Mental testing. There is a long history of mental testing. It has not been limited to children, but indeed had its roots in work with children. Binet (1908) developed one of the first measures. The next major advance in mental test theory was the concept of intelligence composed of separate factors; this conception of intelligence is now widely held in psychological circles. Major contributions were made to this theoretical position by L. L. Thurstone (1938). Factor analytic studies led Thurstone to adopt the position that there were both largely independent factors and a "second-order general factor" operating in estimates of intelligence. In the present form of his test for grades two through four, verbal meaning was operationalized through picture vocabulary and number facility through verbal and quantitative arithmetical problems. Reasoning was hypothesized to develop in the older child from the verbal and number factors which were identified at an earlier age.

Another theory of current importance in the field of mental measurement is that of J. P. Guilford. A tripartite classification of intellect consisting of process, content, and product was proposed by Guilford. He hypothesized five levels of process, four levels of content, and six types of products; this provides a classification system of one hundred twenty abilities or

factors. Behavioral content has received almost no investigation (Guilford, 1961). Many of the cells in his theoretical model lack verification.

Of recent interest in measurement are scalogram analyses. Concepts of monetary meaning were quantified in this way (Schuessler & Strauss, 1950). Wohlwill (1960) studied the development of the number concept by scalogram analysis.

The review of the literature revealed no measurement devices which focused on the reasoning factor and related it to a content of interpersonal relations.

A contribution to theory in mental measurement can be made through operationally defining reasoning by utilizing a technique not commonly employed in other research. Combining this operational definition of reasoning with a content seldom explored, can also make a contribution to theory.

Theories of cognition. There are several theories relating cognition, as the general area of cognitive processes, to interpersonal relations. Heider (1958) and Festinger (1957) are notable examples of cognitive theorists. These theorists focused upon perceptions in interpersonal relations and resolution of cognitive ambiguity. The subjects used in their research have most often been adults.

Of prime theoretical importance for this research is the work of Jean Piaget. His aim was to determine an epistemology of intelligence, that is, to discover the grounds and limits of intelligence. He pursued this aim through research

on the development of the structure of intelligence; he produced the most comprehensive theory of the development of intelligence available. Piaget has studied more frequently the logical cognitive processes such as judgment and reasoning, rather than the more creative processes, an example being imagining. However, in his early work there were no clear-cut emphases upon any cognitive process. He dealt with language, thought, judgment, morality, play, and imitation. Any and all content, through which he could study intelligence and which he could elicit in his clinical-type interview or observe in the spontaneous play of the child, was his material. From this early work evolved his theory of the development of intelligence. Gradually he narrowed the scope of his interest to the more logical processes. As he began to use more sophisticated research procedures, the content chosen was that of physical and mechanical problems covering a range of topics such as quantity, time, number, and mechanics (Inhelder & Piaget, 1958).

Piaget indicated the social life of the child as the creator of logic

> ...as the child discovers that others do not think as he does, he makes efforts to adapt himself to them, he bows to the exigencies of control and verification which are implied by discussion and argument, and thus comes to replace egocentric logic by the true logic created by the social life. (Piaget, 1930, p. 301) (italics mine)

At a later date he emphasized the reciprocity between the social interactions of the child and the organization of the child's mind; as the structures of the mind develop the struc-

tures of interpersonal relationships change; likewise, as there are changes in his interpersonal relationships changes in the structures of the mind are engendered (Flavell, 1963, p. 201). Piaget hypothesized the seven-to-eleven year age period as that time during which genuinely logical structures make their appearance in child thought; he labeled this the concrete-operational stage. Piaget indicated the hypothetical reasoning stage to be a later period in child development.

Despite the tremendous range of his work, Piaget has not investigated the relationship between reasoning and interpersonal relations; he attempted to infer the structure of the mind from early work operationally defined through language and including some problems of interpersonal nature; his later work has been operationally defined primarily in mathematical, physical, and scientific problems (Flavell, 1963).

Piaget's theory provides the incentive for research on: (1) the capability of man to reason about his interpersonal relations; (2) the magnitude of this application of reason in conjunction with other cognitive processes; and (3) the course of development in reasoning about interpersonal relations. Is the course of development in reasoning about interpersonal relations parallel, in advance of, or more retarded than the application of reasoning ability to other areas of content?

Justification of The Research Problem

The review of literature indicated two factors which

justified this research: (1) the lack of investigation on the relation between reasoning and interpersonal relations, and (2) the contribution research on this problem could make to methodology and theory in child development. A third justification not indicated in the review was the value of information on the relation between reasoning and interpersonal relations to individuals with child guidance responsibilities.

Lack of investigation of the problem

Though reasoning has been studied at length and in some depth, the content areas to which the application of reasoning was made were those of geometric figures, string, pulley, and lever problems; problems involving numbers or spatial relations; and problems of physics. The application of reasoning to these problems has greatly expanded our knowledge of the structure, function, and content of the process of reasoning. There remain unexplored the structure and function of reasoning applied to the content area of relations as well as to other content areas. While reasoning is only one cognitive element involved in interpersonal relations and by no means the most important, it certainly merits investigation. The magnitude of its contribution is almost totally unexplored.

Contributions of this investigation to theory and methodology

A definite impetus has been given to the study of cognitive development in children by the work of Jean Piaget.

This emphasis has been directed toward a knowledge of the structure of intelligence in the child. He remained singularly devoted to this research endeavor.[1]

Students of child development are concerned with all the aspects of intelligence, not only structure of intelligence, but the relations between structure and content. It is important to theory in child development that Piaget's hypothesis of the invariant quality of structure be evaluated against many content areas. One cannot assume without evidence that structure is unrelated to content. This research can be justified on the basis of such a contribution to theory.

Another justification for this research arising out of the needs evident in methodology was the need for quantification of variables. Measurement problems in research in child development are vast; the demand for measurement devices is substantial justification.

Practical application

The preceding justifications were important in relating this research to the general study of behavior and development. The final justification for this research was the practical importance which reasoning and interpersonal relations have in the daily life of men. Additional knowl-

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[1]It should be noted that since the middle 1950's Piaget has turned to the study of perception, considering his work on the structure of intelligence to be ready for broader application.

edge gained about the relation between them contributes to the fund of knowledge available to those responsible for teaching and guiding children. Those most vitally concerned are parents and educators.

The use of reasoning as a child rearing technique has received some attention in the literature.

> We call attention to the role of reasoning with the child as an influence on our measure of conscience. If reasoning conduces to identification, then the use of reasoning---explanation, guidance, verbal assistance to the young in the arduous process of growing up---becomes a major quality of the parents, that, simply because it exists in the parents, will be absorbed by the children. The greater the use of reasoning, the greater will be the probability that reasoning as a form of human behavior will be passed from generation to generation (Sears, 1957, p. 393).

Purposes, Assumptions, and Definitions of Terms

The purposes, hypotheses, assumptions and definitions of terms as applied in this research were those in the following discussion.

Purposes of the study

The major purposes of this study were: (1) to develop test items in which reasoning was operationally defined as hypothetical syllogisms with a content of interpersonal relations; (2) to pretest these items with a limited group of subjects; (3) to administer these items to a school population of approximately one hundred children in grades one through four; (4) to administer to the same school

population the Thurstone Primary Mental Abilities, Form 2-4, 1962 revision; (5) to obtain teachers' ranks of children's ability to reason about interpersonal relations; (6) to determine the reliability of the test; (7) to assess certain selected relationships, as determined by product-moment correlations, among the variables of scores on the reasoning test, age, grade, sex, scores on PMA subtests and total test, teachers' ranks, deviations from grade means on the reasoning test, item scores, agreement or disagreement with item premises, number of disagreed premises, and proportion of items passed where subject disagreed with premise; (8) to obtain the means and standard deviations for the reasoning test and the PMA; (9) to present the mean score on the reasoning test by grade.

In addition to the major purposes of the research which involved the development and validation of the reasoning test, there were also two purposes of less importance. One of these purposes was the testing of two minor hypotheses. The other less important purpose was to obtain information about the specific premises accepted by children; this information was descriptive in nature.

Two minor hypotheses were investigated. The first hypothesis was that there is a positive correlation between the age of child and the proportion of items passed on which the subject disagreed with the premise. The second hypothesis was that there is a positive correlation between the

age of the child and the number of disagreed items.

Assumptions

The assumptions made in the development of the problem were three in number. The basic assumption was that reasoning is one of the cognitive processes operating in the interpersonal life of the child in the years from six to ten. The second assumption was that verbal reasoning is of major importance because of the role verbal ability plays in academic and vocational life in this country. This is not to suggest that verbal reasoning is the only ability of importance. The third assumption was that the hypothetical syllogisms operationally defined in items would be a suitable task. This assumption seemed more tenuous than the first two. However, success with the task in the pretest justified the assumption that the task was suitable for the purposes of the research.

Definitions of terms

The definitions of three terms used repeatedly in this study were those which follow.

Reasoning. Theoretically reasoning is the act of using two separate pieces of information to arrive at a conclusion which could not be reached with either piece of information used alone. Operationally reasoning was defined as solving problems involving hypothetical syllogisms with a content of interpersonal relations.

Interpersonal relations. Interpersonal relations is a term indicating a state of mutual involvement between at least

two persons. In this study the term was operationally defined in test items which were empirically derived from the conversations of children. These items were conceptually divisible into items about classifications of people; items about societal rules of the group in which the child lived; and items about evaluations of self and others.

Hypothetical syllogism. A hypothetical syllogism is a form from traditional logic in which there are three propositions in the specific order of major premise, minor premise, and conclusion; the syllogism is hypothetical when the major premise is assumed conditionally or tentatively as a basis for argument. A syllogism was operationally defined in this research in the traditional logical form with the content of the premises that of interpersonal relations. Two conclusions were provided: one correct, the other incorrect. The hypothetical state was assured by ascertaining if the subject agreed or disagreed with the premise; if he did not agree he was asked to "pretend" that he agreed with the statement in the premise.

Summary of The Problem and An Overview of The Investigation

The problem posed for this research was to develop and validate a test of the reasoning of children six to ten years of age about interpersonal relations. Reasoning was operationally defined in the test through items structured as hypothetical syllogisms having as their content inter-

personal relations. The content was derived from empirical data consisting primarily of the conversations of children. The importance of the research problem was justified by the lack of investigation of the problem, the knowledge such research could add to theory and methodology in child development, and the possible contributions to those persons with child guidance responsibilities. In addition to reliability and validation analyses, two minor hypotheses were investigated.

Subsequent chapters in this thesis describe the methods and procedures used in the research and the analysis of the data. The concluding chapter presents the interpretations of the findings and the implications which these findings have for further research.

CHAPTER II

METHODS AND PROCEDURES

The purpose of the research was to develop a provisional test for the measurement of the reasoning of children six to ten years of age about interpersonal relations. The research procedures were completed in three phases: the development of the test items, the pretest, and the validation procedures.

Development of The Test Items

The first phase of the research following conceptualization of the problem as one of quantification was the development of the test. Determining item content, the form of presentation, and the scoring technique were the specific tasks of the investigator in that phase.

Sources of the items

Several approaches were used by the investigator in the initial stages of item development. A priori attempts to develop items were tried; ideas gleaned from theoretical and research literature were stated in provisional forms; a discussion led by a second grade teacher with her class was studied. The most satisfactory source found was the written conversations of children.

A priori efforts. Among the provisional attempts to

develop items were a priori efforts by the investigator. After outlining a typical day of a child, the persons and the roles performed by those persons whom the child contacted were inspected as possible sources of material on reasoning about interpersonal relations.

Sources in the literature. Theoretical frameworks of investigators were reviewed. The work of Piaget (1932) suggested that rules about games might be revealing. Work on ethnic group identification and prejudice in children offered possibilities. Many standardized tests were examined, including projective devices. None of these sources provided the type of information needed in the development of task items which combined the cognitive element of reasoning with the content area of interpersonal relations.

A survey of tasks used for measuring reasoning was undertaken. More than one hundred tasks were surveyed and categorized. These revealed only one study which appeared to combine reasoning and interpersonal relation in any unified way.

Group discussion as a source of items. A second grade teacher was asked to investigate through discussion with her class how the children tried to persuade their parents to permit them to remain up past their usual bedtime to watch television. Following the discussion they were asked to put these ideas into drawings. The teacher's comments proved to be more valuable than the drawings. A tape re-

cording of the discussion would have been more satisfactory.

Empirical source of the items. The major source of information for the items was the observational records in the Longitudinal Study being conducted by the Institute for Child and Family Development at the University of North Carolina in Greensboro. The data in this study include verbatim conversations of the children, twenty in number, who presently range in age from six to twelve. Since the entry of the children into kindergarten and public schools three periods of approximately three to four hours of observation, spaced at intervals through the school year, have been completed on each child. The records of four boys and four girls were selected by the researcher. An effort was made to include the most verbal of the children on the assumption that they might make more explicit a larger proportion of their thoughts. The records of these children extended into the fourth grade in some cases. All of the records of each child from kindergarten through highest grade attained were searched for any possible examples of reasoning about interpersonal relations as revealed in their conversations. Each conversation was placed on an index card. A total of three hundred examples was collected and indexed. The cards were then studied in an effort to gain understanding of the reasoning process through which the child had gone and what premises appeared to underlie the conclusions. From these conversations and the previously mentioned sources, one hundred fifteen

items were derived.

Choice of item form and content

Concomitantly with the search for items a form was evolving. In seeking to define "reasoning" it became evident that all definitions of any precision contained two elements: (1) the use of at least two pieces of information, and (2) the attainment of a conclusion utilizing both pieces of information.

The items were structured with reasoning operationally defined as a hypothetical syllogism. The following criteria were used to evaluate the items: (1) The content of the syllogism was at a level of information available to the child of six to ten years of age. The availability of information was ascertained from recorded conversations. (2) The language level was that of the spoken vocabulary in use by the child of six to ten years of age. (3) The premises paralleled those which seemed to be implicit in the actual recorded conversation of the children. An example illustrates the item form used in the research.[2]

FORM	ITEM CONTENT
Major Premise:	Children are punished by their own parents more than by other grownups.
Minor Premise:	Sally's parents are Mr. and Mrs. Smith.

[2]See Appendix A, pp. 75-97, for all items in pretest.

FORM	ITEM CONTENT
Correct Conclusion:	Mr. and Mrs. Smith punish Sally more than the neighbor.
Incorrect Conclusion:	The neighbor punishes Sally more than Mr. and Mrs. Smith.

A dichotomous conclusion, consisting of one correct conclusion and one incorrect conclusion, was presented to the child. The item was scored 0 for choosing the incorrect conclusion; 1 for choosing the correct conclusion.

In deriving the items from the recorded conversations of the children the content defined as interpersonal was grouped into four logical divisions. From these divisions the items were developed. The original divisions were labeled feelings, rights, authority, and groupings. These labels were useful in organizing the content.

In addition to the identification of the item content by a conceptual label referring to the content, the item was also identified by the type of solution which the child was required to make in arriving at a conclusion. There were two types of solutions. They were labeled categorical and decision. In a categorical solution the conclusion follows directly from the information in the premises; there are no exceptions. In a decision solution the conclusion is plausible but there can be an exception. The language of the premise and conclusion indicate a probability of occurrence. Examples of probability words are some, most, and few.

One hundred fifteen items were used in the pretest.

Of the items, fifty-one required decision solutions; sixty-four required categorical solutions. The number of items in each classification is presented in Table 1.

TABLE 1

CLASSIFICATION OF PRETEST ITEMS

Content Label	Solution Label		Total Number of Items
	Number of Decision Items	Number of Categorical Items	
Feelings	32	33	65
Rights	9	12	21
Authority	2	7	9
Groupings	8	12	20
Total	51	64	115

The Pretest of The Items

In the pretest phase of the research attention was directed to the selection of subjects, the procedures for administering the test, an item-test correlation analysis of the data, and a revision of the pool of items based on the analysis and the information gained during the administration of the test.

Children in pretest

The criteria for selection of children for pretesting were: (1) the child should be 6.0-6.11 years, 8.0-8.11

years, or 10.0-10.11 years of age; (2) the child should not be a member of the population selected for the final validation of the test, and (3) the parents of the child should agree to his cooperation in the test situation.

The items in the pretest were divided into four sets. Four subgroups of children were used in the pretest. One set of items was used with each subgroup of children. Every subgroup was composed of nine children; of the nine children, three children were six years of age, three were eight years of age, and three were ten years of age. The total group tested in the pretest was thirty-six children. The residences of the children included rural housing, public housing, and middle and high income urban housing. There were nineteen boys and seventeen girls in the pretest group.

Procedures for administering the test

Efforts were made to meet the child in a place which was as quiet as possible. In no case was another member of the family present. The usual place was the child's bedroom; in some cases the kitchen was used. The tape-recorder was set up prior to the child's entry. A table was used if available; the child was seated across from the researcher. When no table was available a table-like arrangement was improvised. The length of time for an interview was approximately thirty minutes. In only one case, a six-year-old child, was the researcher unable to complete the interview.

The one hundred fifteen items were divided into four

sets. The length of time which would have been necessary for the administration of all of the items to a single child precluded the use of them all in one interview. Set I contained thirty items; Set II contained twenty-nine items; Set III contained twenty-seven items; and Set IV contained twenty-eight items. Each set contained approximately the same number of items representing the four types of interpersonal content and the same number of items representing the two types of decisions.

A format of instructions[3] was followed. The child was encouraged to comment following his conclusion and he was asked why he chose a certain answer. His agreement with the premise was probed in every instance where there was hesitation or disagreement with the premise. During the process of administering the pretest the researcher added the request that the child "pretend" he agreed with the premise when the child had indicated disagreement. All of the interviews were tape-recorded.

Analysis of pretest

Pretest data were analyzed by the use of item-test correlations for all items. These correlations were plotted against the difficulty levels of the items. The difficulty level was the item mean. Two criteria had to be met for an item to be retained: (1) the range of the correlation of the item with the test must be between .40 and .80 and,

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[3]Appendix A, p. 74.

(2) the item mean must be between 3/9 or .33 and 7/9 or .78. The most discriminating item was one which half the children passed and half failed. In that case the item was of median difficulty; the item mean was .50 and the item variance was pq=(.50) (.50)=.25. There were thirty-six items which met both the criteria for retention.[4]

Revisions following pretest

The revisions of the pretest items included selecting thirty items for the final test, changing the wording of certain items, classifying the remaining items, and ordering the items in the final test form.

An interview time not to exceed thirty minutes was desired so that excessive fatigue could be prevented in the child and interest could be maintained. The pretest had indicated that a test of thirty items required approximately thirty minutes to administer. Therefore, a decision was made to limit the test to thirty items. These thirty items were selected from among the thirty-six which had met the criteria level previously established. The researcher's judgment was the basis for the selection of the thirty items.[5] Minor changes were made in the wording of some of the items.[6]

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[4]Plots of the items are presented in Appendix A, pp. 98-99.

[5]Items which were selected appear in Appendix B, pp. 102-107.

[6]See Appendix B, p. 108.

A classification of the thirty items which constituted the final form of the test is given in Table 2. Those items from the pretest which had an interpersonal content labeled "rights" or "authority" were placed together in a category labeled "societal rules" in the final form of the test. Those items from the pretest labeled "groupings" were relabeled "classification of people" in the final form of the test. Those items from the pretest labeled "feelings" were renamed by expanding the title of the category to "feelings about self and others."

TABLE 2

CLASSIFICATION OF ITEMS IN FINAL RESEARCH MEASURE

Content Label	Solution Label		Total Number of Items
	Number of Decision Items	Number of Categorical Items	
Societal rules	1	6	7
Classification of people	2	4	6
Feelings about self and others	5	12	17
Total	8	22	30

The arrangement of the items within the final test was by category. Items one through seven were those items with an interpersonal content labeled "societal rules". Items eight through thirteen were those with content labeled

"classification of people". The remaining items were those labeled "feelings about self and others". The order of items within each category was that judged by the researcher to be an order of increasing difficulty.

Validation of The Test

The final phase of the research was a validation of the measure of reasoning about interpersonal relations developed and revised in the early stages of the research.

Measures used for validation

Two measures were used for purposes of validation; the Science Research Associates Primary Mental Abilities, Form 2-4, Revised 1962, was the more important measure. Validity was evaluated in terms of correlation and lack of correlation with PMA tests. The other measure was teachers' ranks of reasoning ability. Each teacher ranked the ability of the students in her class to reason about interpersonal relations.

Primary Mental Abilities. The PMA is available in several forms. The form for grades two through four was chosen for administration as the measure of validity. Validity was evaluated in terms of correlation and lack of correlation with PMA tests. The children chosen for study were in grades one through four. Two forms of the PMA were developed to test this grade span. There is a PMA for children in kindergarten and first grade. The next form of the PMA is for children in grades two through four. The decision

was made to use the PMA, Form 2-4 for all of the grades in this research. This use of a single form was an extension of the range of the PMA over a grade for which it was not developed. The chronological age, however, was included in the scores reported by this publisher. The scores reported begin with the chronological age of six years, four months. None of the children in the study was younger than this age. The use of a single form of the PMA reduced the problem of comparability between forms on the measures used for the validation of the reasoning test.

There are four subsets in the PMA, Form 2-4. They are: (1) verbal meaning operationally defined in pictures; (2) spatial relations operationally defined in pictorial items; (3) number facility operationally defined in number series problems, written problems of arithmetic, and addition problems; and (4) a test of perceptual speed operationally defined in pictures, two of which are identical.

Teachers' ranks. Teacher rankings of the children were obtained by the following procedure. Each teacher was handed an envelope containing the name of each child in her class on a separate slip of paper. She was asked to do the following task.

> Please take fifteen minutes of your time to take the names of your students which are enclosed in this envelope, each written on a separate card, and arrange these names in descending order. Begin with the name which you feel is the child who reasons best about interpersonal relations.

(I mean by reasoning the ability to take two pieces of information which together will enable the child to reach a conclusion about an event involving people.)[7]

The population

The population chosen for the validation of the final thirty-item test consisted of the children in the Curry School, the laboratory school of the University of North Carolina at Greensboro. All of the children in grades one through four participated in this study. The division by sex was approximately equal. The number of subjects per grade averaged 26.5. The total number of subjects was one hundred six; fifty were male; fifty-six were female. The age range was from seventy-seven to one hundred twenty-four months; the mean age was ninety-nine months. These grade and population statistics are presented in Table 3.

TABLE 3

POPULATION STATISTICS

Grade	Number	Male	Female	Age Range in Months	Mean Age
Grade 1	24	12	12	77- 88	81
Grade 2	28	14	14	85-110	94
Grade 3	28	14	14	85-115	104
Grade 4	26	10	16	111-124	117
Total	106	50	56	. .	99

[7]Appendix B, p. 110, letter of instructions to teachers.

Many of the subjects in this population were children of faculty members of the University. Another portion of the children came from families for whom the motivation to attend the laboratory school is sufficiently high for them to transport their children out of their school districts and agree to do this for the first six years of school life. Additional members of the classes were children who live in the district served by the school. Because of the location of the University, which is not primarily a family residential area, relatively few children actually live within the district.

The mean of the total scores on the PMA was one hundred twenty-six; the mean age was ninety-nine months. Referring these averages to the PMA tables gave a mean deviation I.Q. of one hundred nine for the total population.

Scheduling and administration of the tests

There were two schedules arranged: one schedule for the individual testing on the reasoning test; another for the group testing using the PMA. A meeting including the researcher, the school principal, and the teachers of the participating classes was held. The researcher explained very generally the purpose of the research as a validation measure of children's reasoning about interpersonal relations. Teachers were told they would have an opportunity for individual and group conferences following the completion of the research and compilation of the data. The researcher also indicated that the results of the PMA would be filed in each child's

folder for availability to the school. Dates were selected for the data collection. The ease with which collection of data proceeded was due to the willing cooperation of the teachers.

Administration of the reasoning test. Ten or eleven children were scheduled daily for the individual administration of the reasoning test which was completed by the researcher. This schedule permitted the completion of the individual interviews within a two-week period. It also provided for pacing so that the researcher saw approximately the same number of children daily. The time allocated for an interview was thirty minutes. Data were collected for grades one and four during the first week; for grades two and three during the second week. The children in grades one and two were seen in the morning. The children in grades three and four were seen in the afternoon. The order of interviews was alphabetical, alternating a boy with a girl.

Before any testing began on a given class the researcher entered the classroom and was introduced to the children. They were told very briefly that the researcher was studying at the University and wanted to ask them some questions about people. They were also told that their answers would help the researcher. The children were not told about the PMA until all individual interviews were completed.

All of the interviews were carried out in the work room adjoining each classroom. This room is used by the

class for group and individual work. In each case it was clean, attractively furnished, well lighted and ventilated. It was informal and sometimes cluttered with the projects of the children. The researcher posted a list with the teacher each day indicating the names of the children to be tested and the order of testing. As each interview was completed the child was asked to send in the next person.

A table was arranged so that researcher and child faced each other at approximately the same level. The researcher was seated upon the entry of the child and always asked him to sit down, indicating the chair across from her. A very brief time was spent in attempting to help the child be at ease. The statements in the introduction to the test were followed. If it appeared that slightly more time might be helpful to the child in establishing a comfortable situation, a brief conversation ensued. As it was important in preventing fatigue and maintaining interest that the child not remain in the chair beyond the thirty-minute period, no lengthy introductions or conversations occurred.

Any questions which the child asked were answered as simply as possible. The researcher moved immediately to the standard instructions. The research instrument was referred to always as "some questions which will help me understand more about boys and girls and what they think about people", never as a test. Almost without exception the children accepted the task in a cooperative and interested fashion.

In order to prevent, as much as possible, the contamination of the measure for validity, no tallying of scores or computing of data was done by the researcher until all the collection of data was completed.

Administration of the PMA. Following a break of seven school days between the collection of data on the reasoning test, the PMA was administered. All the group testing was done in the mornings. The PMA was broken into two parts; verbal meaning was given the first day; the spatial, number, and perceptual parts were given the second day. The PMA was administered according to directions in the manual. The testing schedule in grade one was:

Monday	Tuesday	Wednesday
Group 1	Group 3	Group 2
Group 2	Group 1	Group 3

Placement in the testing group was identical with placement in reading groups which was established by the teacher. The researcher worked alone with the small groups in grade one. There were six, nine, and nine children respectively in the three groups.

Grades two, three, and four were tested in total groups. The teacher in each grade aided the researcher in monitoring, and checking examples. The researcher assumed responsibility for the instructions, and timing of the test.

Four children missed parts of the group testing. Their tests were completed individually or in groups of two.

Two weeks were needed for completing the group testing. The total span of time from the beginning of the data collection through the completion covered five and one-half school weeks.

Data analysis

Scores for odd-numbered items, scores for even-numbered items, total scores on the reasoning test, and scores on the four PMA subtests were compiled by the researcher. The proportion of items on which each subject disagreed with the major premise and still passed the item were computed. The deviation of each child from the grade mean was computed for the reasoning test. Data were punched on cards and taken to the University of North Carolina Computation Center where product moment correlations were determined for 75 variables. Correlations involving the reasoning test were examined for information on reliability, item-test correlations, correlations with PMA scores, and correlations with teachers' ranks. The relationship between the variables which were part of the minor hypotheses were also examined.

Summary

Three phases of research were conducted in this study. The first phase consisted of the development of the one hundred fifteen items from which the final items were selected. The second phase of the research was the pretesting of the one hundred fifteen items, divided into four groups and administered to thirty-six children. Nine children were tested with each group of items. Following pretesting, an analysis

was made of these items and the thirty most discriminating and highly intercorrelated items were selected for the final research form of the measure.

The research was completed in the third phase. The validation phase consisted of the individual administration of the reasoning test to the one hundred six subjects, the collection of data on the PMA measures for the same population, and the analysis of the data obtained.

The remainder of the dissertation will present in detail the results of the analysis of the data, the conclusions and implications drawn from this analysis, and recommendations which were made for further research.

CHAPTER III

RESULTS

The problem investigated in this research was the development, pretesting, and validation of a measure of the reasoning of children six to ten years of age about interpersonal relations. The purpose of the data analysis was to: (1) evaluate the reliability of the test; (2) determine the relationship between the reasoning test and PMA tests and teachers' ranks; (3) investigate the relation between the reasoning test and grade, age, and sex; (4) analyze the item-total test correlations; (5) examine two minor hypotheses; and (6) present descriptive data about the reasoning test and the premises which composed the test.

General Design for The Statistical Analysis

The general design for the analysis of the data was a 75 x 75 matrix for which the product-moment correlations for 75 variables were computed by a Univac 1105 Computer. The mean and standard deviation was also obtained for each of the 75 variables. The matrix contained $\frac{n(n-1)}{2}$ or 2,775 coefficients of correlation. Scores on each variable for the one hundred six subjects in the study were punched on cards. The variables and manner of scoring are described below.

	Variable	Manner of Scoring
1.	Score on odd items, reasoning test	00-15
2.	Score on even items, reasoning test	00-15
3.	Total score, reasoning test	00-30
4.	Age	77-124 months
5.	Grade	1, 2, 3, 4
6.	Sex	0, female; 1, male
7.	PMA verbal score	00-60
8.	PMA spatial score	00-27
9.	PMA number score	00-60
10.	PMA perceptual score	00-50
11.	PMA total raw score	32-197
12.	Proportion of items on which child disagreed with premise but passed item	0.00-1.00
13.	Number disagreed premises	00-30
14.	Teachers' ranks	01-28
15.	Deviations from grade means	03.6-16.1 (Coded to eliminate minus signs)
16-30.	Items 1-30 on reasoning test in consecutive order	0, failed; 1, passed
31-75.	Agreement or disagreement with premise for items 1-30 on reasoning test; items in consecutive order	0, disagreed; 1, agreed

Reliability

The index used for estimation of reliability was the split-half correlation coefficient. Odd and even item scores were used for the computation. The coefficient obtained was .48; when corrected for the length of the half test this coefficient became .65.

A reliability coefficient for the fifty-two subjects in grades one and two was also computed since the largest difference between means occurred for these two grades.[8] The computation yielded an odd-even split-half correlation of .53, corrected for length to .69, a slightly higher value than that obtained for the total population.

Validation Data

Measures used for validation purposes

Two sets of measures for the determination of validity were obtained: (1) scores on the SRA Primary Abilities Test with which validity was evaluated in terms of correlation and lack of correlations between the reasoning test and the PMA tests; and (2) the teachers' ranks of the ability of children in their classes to reason about interpersonal relations

Primary Mental Abilities. The primary measure used in determining validity in terms of correlation and lack of correlation with the reasoning test was the Primary Mental Abilities, Form 2-4, Revised 1962. This test for grades two

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[8] See Table 12, p. 49.

to four has four subtests. The four subtests are verbal meaning, spatial relations, number facility, and perceptual speed. The four subtests contribute to a general measure of ability so that five scores are obtained. The number subtest was indicated in the manual for an earlier form of the test as the factor out of which the factor labeled reasoning develops (Thurstone, 1953, p. 3). There is no subtest labeled reasoning in the form for grades two through four. Such a subtest was in a prior form covering this grade range.

The reasoning test had correlations of .52 with both the verbal meaning and number tests of the PMA. Correlations between the reasoning test and the spatial and perceptual tests of .39 and .40 were lower than the correlations with the verbal and number tests. A correlation of .57 between the reasoning test score and the PMA total score indicated the reasoning test to be more highly correlated with the general measure than with any of the subtests. All of the reasoning test correlations with the PMA are in Table 4.

TABLE 4

REASONING TEST SCORE AND PMA TEST SCORE CORRELATIONS

	PMA V	PMA S	PMA N	PMA P	PMA T
Reasoning Test Score	.521	.391	.521	.400	.565

The PMA intercorrelations were evaluated since there was opportunity to examine the way the subtests related to the theoretical framework out of which the PMA was developed. It was postulated by Thurstone, in the revisions of his theory that the PMA measured several relatively pure factors, and a second order general factor (Thurstone, 1938; Thurstone, 1948). The intercorrelations obtained on the population in this study may be interpreted as supporting this theoretical position although their magnitudes certainly indicate a substantial general or second-order factor. These correlations are presented in Table 5.

TABLE 5

PMA INTERCORRELATIONS IN THIS STUDY

	Verbal	Spatial	Number	Perceptual	Total
V	. .	.431	.790	.532	.856
S	. .	. .	.456	.425	.599
N	. .	. .	. .	.588	.954
P	. .	. .	. .	. .	.751

Intercorrelations by grade were given in the technical report of the PMA (Science Research Associate, 1965, p. 37). The researcher averaged these intercorrelations in order to make possible a comparison with the data in this study. The presence of the intercorrelation for a reasoning subtest sug-

gested these data may have been from previous studies, rather than studies of the present revision of the PMA; there is no reasoning subtest in the 1962 revision for grades two through four.

Comparison of intercorrelations in Table 6, taken from the PMA standardization sample with the correlations in Table 5 for the population used in this study, indicated higher intercorrelations between verbal and number abilities for the population in this research. The verbal-number correlation in the PMA sample was .63; the same correlation for the population in this research was .79. Higher correlations were also obtained between number and verbal test scores related to total test score for the present research population. The magnitude of the relation was .86 for verbal-total score relation and .95 for the relation between the number test and the total test score. These same relationships were .81 and .86 in the PMA standardization sample.

Teachers' ranks. Teachers' ranks were meaningfully related only to the deviation from the mean for each grade. It was the use of the mean as a reference point which permitted the relationship to be computed for the total group. The correlation was -.45. The teachers ranked only the subjects in their own grade. They ranked from 1 to N, number one being the child judged by the teacher to have the greatest ability to reason about interpersonal relations. Higher numerical ranks were indicative of lower ability as judged by

the teachers. Thus a negative correlation was obtained.

TABLE 6

AVERAGED CORRELATIONS FROM PMA STANDARDIZATION SAMPLE

	Verbal	Spatial	Number	Perceptual	Total
V	. .	.55	.63	.49	.81
S	. .	. .	.53	.47	.65
N	. .	. .	. .	.56	.86
P	. .	. .	. .	. .	.77

Relation between reasoning test and other variables

The correlations between the reasoning test and sex, age, or grade variables were obtained in the computation. Correlations between sex, grade, or age and variables other than the reasoning test were also obtained.

Sex. Correlations with sex are given in Table 7. The relation between the reasoning test and sex was negative and very low, -.12. This minus correlation indicated that males had lower scores on the reasoning test than females.

Sex as a variable proved to have very low positive or negative correlations with other variables of interest. A low positive correlation, males having higher scores, was obtained for the relation between sex and the proportion of item passed on which the subject disagreed with the premise; the correlation was .08. A correlation of .13, males having

the higher scores, was obtained between sex and number of disagreed premises.

TABLE 7

CORRELATIONS BETWEEN SEX AND OTHER VARIABLES

	Number disagreed premises	Prop. items passed with disagreed premises	Reas. test score	PMA V	PMA S	PMA N	PMA P	PMA T
Sex	.134	.075	-.120	.103	.209	-.017	-.193	-.006

Sex as related to the PMA subtest scores had very low correlations. The spatial test correlated .21, males having higher scores. On the perceptual test, primarily a test of speed, the correlation was -.19, males having lower scores. The correlation between verbal test score and sex was .10, males again having higher scores. The correlation of sex with the total test was -.01.

Age. Correlations with age appear in Table 8. Grade and age were highly related; the correlation was .94. A very high correlation would be expected because of the chronological basis for assigning children to classes. There was a wide range in the correlations between age and the PMA subtest score. Age was related to the number test by a correlation of .84. The correlation with the verbal test was .68 and with the perceptual test .57. The lowest correlation with a PMA subtest, .34, was the relation between age and

the spatial ability test. The correlation between age and the total PMA score was .82.

TABLE 8

AGE AND GRADE CORRELATIONS WITH SELECTED VARIABLES

	Reasoning Test	PMA V	PMA S	PMA N	PMA P	PMA T	Grade
Age	.384	.681	.351	.839	.572	.819	.940
Grade	.448	.731	.348	.891	.598	.866	. .

Grade. Correlationswith grade also appear in Table 8. Age correlations were of greater interest when seen in relation to grade correlations. Grade had a slightly higher relationship with all the variables which appear in Table 8, than did age. The only exception was the correlation with spatial ability which remained the same, .35, for both age and grade. Grade had a correlation of .45 with the reasoning test. The correlation was .73 between grade and the PMA verbal test and .89 with the PMA number test. The perceptual test in the PMA correlated .60 with grade. The relation between the PMA total score and the grade variable was .87.

Item analyses

Item data were examined for three relationships: (1) item-test correlations; (2) age-item correlations; and (3) grade-item correlations.

Item-test correlations. Item-test correlations appear

in Table 9. All of the items in the test were positively correlated with the total score. The magnitude of the correlations ranged from .04 to .55. Nine items had correlations of .40 or above. There were sixteen items for which the item-test correlations ranged from .20 to .40. Only five items, number 2, 6, 8, 15, 24, had item-test correlations below .20.

TABLE 9

CORRELATIONS BETWEEN ITEM SCORES AND TEST SCORES

Item Number	r	Item Number	r	Item Number	r
1.	.242	11.	.200	21.	.500
2.	.154	12.	.428	22.	.474
3.	.216	13.	.223	23.	.313
4.	.410	14.	.308	24.	.082
5.	.285	15.	.071	25.	.320
6.	.185	16.	.346	26.	.261
7.	.278	17.	.296	27.	.547
8.	.043	18.	.429	28.	.336
9.	.422	19.	.350	29.	.271
10.	.448	20.	.327	30.	.449

The nine items with the highest item-test correlations, those above .40, were plotted against the means. Four of the items had means above .85. The most discriminating items were the five remaining ones: numbers 4, 18, 22, 27, and 30. Figure 1 contains these plots.

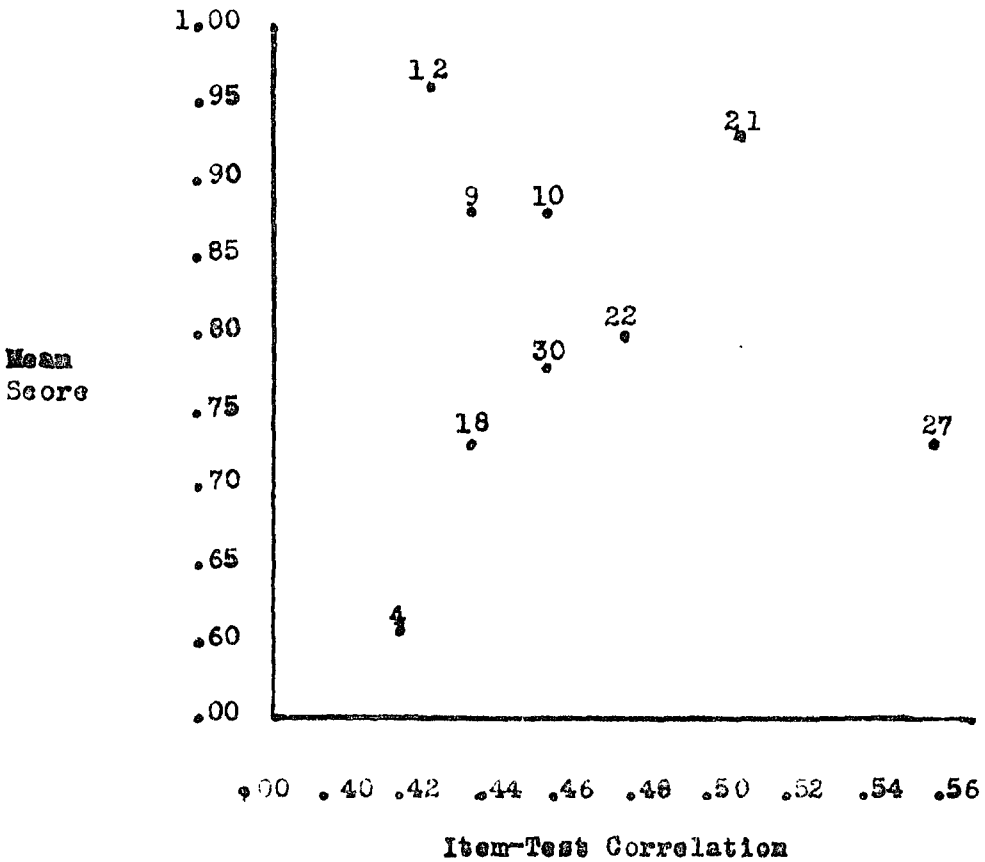

FIGURE 1

MOST DISCRIMINATING ITEMS

Age and grade correlations with item scores. The correlations between age and item scores, and grade and item scores were quite similar. (See Tables 10 and 11.) Very low correlations were obtained. The range was from -.16 to +.28 for the age and item-score correlations. The range in correlations between grade and item scores was from -.22 to +.31.

TABLE 10

AGE AND ITEM-SCORE CORRELATIONS

Item Number	r	Item Number	r	Item Number	r
1.	.185	11.	-.037	21.	.017
2.	.151	12.	.221	22.	.022
3.	-.090	13.	.185	23.	.173
4.	.289	14.	.137	24.	.215
5.	.066	15.	.189	25.	.107
6.	.020	16.	.086	26.	.200
7.	.096	17.	.081	27.	.220
8.	.029	18.	.203	28.	.282
9.	.251	19.	.230	29.	-.159
10.	.095	20.	.047	30.	.250

Minor Hypotheses

There were two minor hypotheses explored: (1) there is a positive correlation between age of the child and the proportion of items passed on which the subject disagreed with the major premise; and (2) there is a positive correla-

tion between the age of the subject and the number of disagreed premises.

TABLE 11

GRADE AND ITEM-SCORE CORRELATIONS

Item Number	r	Item Number	r	Item Number	r
1.	.194	11.	-.031	21.	.203
2.	.136	12.	.231	22.	.183
3.	-.042	13.	.200	23.	.196
4.	.295	14.	.148	24.	-.186
5.	.096	15.	-.219	25.	.185
6.	-.003	16.	.141	26.	.259
7.	.072	17.	.132	27.	.238
8.	-.108	18.	.296	28.	.312
9.	.023	19.	.281	29.	-.114
10.	.145	20.	.078	30.	.275

There was a moderate positive correlation of .27 between age and the proportion of items passed on which the subject disagreed with the premise. The second hypothesis postulated a positive relation between age and number of premises with which a child disagreed. The correlation obtained for the relation was -.01.

Descriptive Data

Means and standard deviations were obtained for the reasoning test and for the PMA. Mean scores were also

obtained for agreement or disagreement with premises.

Means and standard deviations

The mean score on the reasoning test was 25.8. The standard deviation was 3.0. A perfect score on the reasoning test was 30. Very little difference in scores appeared between the grade means. The increase between scores for grades one and two was 3.02 points. This was the largest increase. The increase in scores between grades two and four was .26 of a point; the increase in scores between grades three and four was .70 of a point. The mean score and range of scores for each grade are presented in Table 12. The range in scores was from 17 to 29 in grade one; this low score of 17 was the lowest in any grade. The range in grade two was from a low of 21 to a high of 30. Grade three had a 20 to 29. The range in grade four was from a 23 to a maximum of 30.

TABLE 12

MEAN SCORES ON REASONING TEST PRESENTED BY GRADE

Grade	Mean	Increase in number of points	Range in Scores
Grade 1	23.12	. .	17-29
Grade 2	26.14	3.02	21-30
Grade 3	26.40	.26	20-29
Grade 4	27.10	.70	23-30

Mean raw scores and standard deviations for all the PMA tests are presented in Table 13.

TABLE 13

MEAN RAW SCORES AND STANDARD DEVIATIONS ON THE PMA

PMA Test	Mean Raw Score	Standard Deviation	Possible Range of Scores	Deviation I.Q. for Mean Age of 99 mo.
Verbal	49	5.9	0-60	115
Spatial	18	4.2	0-27	110
Number	33	17.5	0-60	102
Perceptual	25	6.9	0-50	104
Total	126	29.6	32-197	109

Both verbal and spatial scores are well above a score at the fiftieth percentile; the standard deviations are small. Both of these facts are reflected in the deviation I.Q.'s which are 110 or above. The mean raw score for the number test was thirty-three; this test had a very large standard deviation of 17.5 points. This large standard deviation was produced by the very low scores which the children in the first grade obtained on the number test. It was the number test in the PMA, Form 2-4, which was the most difficult for the first grade children.

The mean age for the population in this study was 99 months. All of the deviation I.Q. scores were obtained by referring to the conversion tables for the PMA (Science Research Associates, 1962) using the mean age and the mean raw scores as the reference figures. The deviation I.Q. for the

population using the means as a reference was 109.

Agreement or disagreement with premise

The means of the scores indicating agreement or disagreement with the premise were studied for the information revealed about concepts of interpersonal relation attained by children six to ten years of age. Only six major premises were accepted by fewer than 75 per cent of the children. The items in which the premise was not accepted at this criterion level were 7, 10, 18, 23, 24, and 30, as indicated in Table 14. The unacceptable premises were the following statements.

7. A person who cannot help the team is usually not chosen to play.

10. Not all teachers teach children how to read.

18. It makes us feel good to know a riddle that others do not know.

23. Hitting in a game of wrestling is for fun.

24. All people need help from other people.

30. When we are angry and can't get back at the person who made us angry, we hurt someone else.

Item number 23 was the least acceptable premise; only 50 per cent of the children accepted this premise. Premises for items 12 and 21 were accepted by 100 per cent of the children. These premises state

12. Not all boys and girls of the same age are the same size.

21. Sometimes a teacher is not pleased with what a (boy) (girl) does.

TABLE 14

ITEM MEANS FOR AGREEMENT-DISAGREEMENT WITH PREMISE

Item Number	Mean Score	Item Number	Mean Score	Item Number	Mean Score
1.	.90	11.	.91	21.	1.00
2.	.80	12.	1.00	22.	.92
3.	.95	13.	.97	23.	.50
4.	.97	14.	.98	24.	.62
5.	.96	15.	.87	25.	.94
6.	.78	16.	.96	26.	.95
7.	.68	17.	.91	27.	.99
8.	.94	18.	.68	28.	.84
9.	.93	19.	.94	29.	.91
10.	.54	20.	.98	30.	.44

Summary

In keeping with the purposes of the research problem certain intercorrelations for 75 variables were studied. Odd-even split-half reliability obtained was .48, corrected to .65. A correlation of .57 was obtained between the reasoning test and the PMA, Form 2-4. The highest PMA test score and reasoning test score correlations were with the verbal and number tests where the correlation was .52 in both cases. The correlation between teachers' ranks and deviations from grade means on the reasoning test was -.45. This negative correlation was in the expected direction due to the manner

of assigning ranks.

The relation between sex and the reasoning test was a negative correlation of -.12, males having lower scores. Age and scores on the reasoning test were correlated by a relationship of .38. The correlation between grade and the reasoning test score was .45; this was higher than the age correlation with the reasoning test.

Two minor hypotheses were examined. There was a correlation of .27 between age and passing an item with which the child disagreed with the major premise. There was a correlation of -.01 between age and number of premises with which a child disagreed.

Inspection of grade means indicated that only between grades one and two was there any noticeable difference in score. The difference was three points.

All of the items in the test were positively correlated with the total score; the range of these correlations was from .04 to .55. The correlations between age and item scores and grade and item scores were similar.

Only six item premises were accepted by fewer than 75 per cent of the children. Two premises were accepted by all of the children.

In the final chapter of this dissertation a summary of the study is presented. The conclusions and implications of the data analysis are discussed. Limitations of the research are indicated and recommendations are made for further research.

CHAPTER IV

CONCLUSIONS

Summary of Problem, Procedures, and Results

The relation between the cognitive process of reason- and the personality area of interpersonal relations was identified as a relation on which little research evidence was available. The problem investigated in this research was the development, pretesting, and validation of a measure of children's reasoning about interpersonal relations. The children in the study were from six to ten years of age.

Reasoning was operationally defined in the study through hypothetical syllogisms which had a content of interpersonal relations. The content of these items was not that drawn from traditional examples in logic, but the content was empirically derived from the conversations of children in the age range under study.

During the development of the reasoning test one hundred fifteen items were written. The form of the item was that of the traditional syllogism consisting of major premise, minor premise, and conclusion. Two alternatives were presented to the child as conclusions. The child's task was to indicate the correct conclusion.

The research measure was pretested on a group of

thirty-six children. There were four subgroups in the pretest group. Each subgroup was composed of nine children: three children six years of age, three children eight years of age, and three children ten years of age.

The one hundred fifteen items comprising the pretest were divided into four sets; each set contained approximately twenty-nine items. One set of items was administered to one of the subgroups in the pretest group.

Item-test correlations were computed and plotted against mean score for each of the one hundred fifteen items. Thirty-six items had item-test correlations between .40 and .80 and difficulty levels of three to seven children out of nine passing the item. The researcher selected thirty items from among these thirty-six items. These thirty items composed the test of reasoning about interpersonal relations.

In order to obtain measures of reliability and validity, the reasoning test was administered to a population of one hundred six children in grades one through four. The individual interview technique developed with the pretest was used as the standard procedure; it was conducted by the researcher.

Two measures were obtained for each subject in the population for purposes of determining validity: (1) Scores on all the tests in the Primary Mental Abilities, Form 2-4, Revised 1962; and (2) teachers' ranks of children's ability to reason about interpersonal relations. Validity was eval-

uated in terms of correlation and lack of correlation with PMA tests and correlation and lack of correlation with teachers' ranks.

Product-moment correlations were computed for a 75 x 75 matrix including the variables of odd score, even score, total score on reasoning test, age, grade, sex, five PMA test scores, proportion of items passed on which the child disagreed with the major premise, number of disagreed premises, teachers' ranks, deviations from grade means, thirty item scores on the reasoning test, and thirty item scores for agreement-disagreement with the premises.

The data were analyzed for the major purpose of determining the reliability and validity of the reasoning test. The relationship between the variables of grade, age, or sex was studied. Item-test correlations were analyzed. In addition to the major purposes of data analysis, two minor hypotheses were examined and a limited amount of descriptive data on the premises was reported.

Interpretation of Results

The interpretation of the results of this research included a consideration of: (1) the conclusions to be drawn from the analysis of the data; (2) the limitations to which these conclusions are subject; (3) the implications of the research, and (4) the recommendations made for further research.

Conclusions were drawn about the major purposes of the research which were the reliability and validity of the reason-

ing test and the relation of the reasoning test to the variables of sex, age, and grade. Conclusions were also drawn about the less important issues in the research which were the minor hypotheses investigated.

Reliability

The odd-even split-half reliability coefficient of .48, corrected for length to .65 indicated a moderate degree of reliability. It was sufficiently high to warrant the use of the measure of reasoning as a research instrument. The computation of the split-half reliability for the fifty-two subjects in grades one and two yielded a somewhat higher correlation, .53, corrected to .69. This increased the reliability of the instrument slightly for children in grades one and two.

Two factors operated to reduce the size of the reliability coefficient. First, the items used in the test were apparently too easy for the population. Though empirically derived the implication was that children can handle hypothetically posed syllogistic problems about interpersonal relations of a more complex nature than those revealed in their spontaneous conversations. Interviews which probe for the limits rather than the norms of their premises regarding interpersonal relations would be desirable.

Second, low item difficulty reduced the variability of scores yielding what appeared to be a relatively homogeneous population.

The similarity of the background of the subjects and the ease of the items as associated with the level of ability of the children in the validation population contributed to a homogeneity of test scores on the reasoning test. The coefficient of correlation as a statistic is dependent upon variability for its magnitude; it reflected the lack of variability in the reasoning test scores of this population by its moderate magnitude.

Validity

The reasoning test had correlations of .52 with both the verbal meaning and number tests of the PMA; these were moderately high correlations. Correlations between the reasoning test and the spatial and perceptual tests of .39 and .40 were lower. These were moderate correlations at the low end of the moderate range. The correlation of .57 between the reasoning test and the PMA total score was the highest of the moderate correlations. The reasoning test appeared to be tapping a factor which was moderately and positively correlated with verbal and numerical factors, both of which are highly related to success in school. The higher correlation between the reasoning test and the total PMA score, however, indicated that a general factor of ability was also operating throughout all the tests. Relatively high intercorrelations among the PMA tests also supported this conclusion that a general factor was present.

The moderate correlations with the PMA factors sug-

gested the possible uniqueness of the factor tapped by the reasoning test. Such an ability might be called reasoning about interpersonal relations. This conclusion must be considered only a possibility because the reliability of the test places a ceiling upon the validity of the test.

Teachers' ranks of children's ability to reason about interpersonal relations were another measure of validity. The ranks were related to deviations from the mean for each grade by a correlation of -.45. This correlation indicated a moderate agreement between the ranking and the test. The magnitude of the agreement was not so large as that of the PMA as a measure of validity. Reliability data were not obtained for teachers' ranks. The teachers' ranks were not evaluated in relation to the PMA tests.

Sex, age, and grade

The relation between the reasoning test and sexwas a low, negative correlation of -.12, males having lower scores. Though a very small correlation, it is of interest because it indicates that females were more adept in reasoning about interpersonal relations than males. Research on tests of ability has suggested that males usually obtain higher scores on reasoning ability. Females have been considered to be more skillful in interpersonal relations; affective processes, not cognitive processes such as reasoning, have usually been under consideration. This -.12 correlation opens the way to the

possible interpretation that reasoning about interpersonal relations is an ability separate and distinct from reasoning about other content areas.

Sex as related to the PMA test was correlated in the expected direction. There was a near zero correlation for sex and the total score. This is a typical finding since ability tests are usually developed so that items which discriminate one sex from the other are removed. The perceptual test, primarily one of speed, correlated -.19 with sex, males having lower scores. The spatial test correlated .21 with sex, males having higher scores. Both these spatial and perceptual correlations were in the expected direction. The correlation between the verbal score and sex which was a low, positive correlation of .10 was of interest. The positive correlation indicated that higher scores were obtained by the males in this population; females have usually obtained higher verbal scores in other research studies.

An obtained correlation of .38 between reasoning test score and age when evaluated against an obtained correlation of .45 between the reasoning test and grade suggested experience as more important than age in the development of this ability. This interpretation must remain at the level of a suggestion because of the moderate rather than high reliability of the reasoning test.

All of the items in the reasoning test were positively correlated with total scores. Nine items had correlations of

.40 or above, values which are considered high item-test correlation. There were sixteen items for which the item-test correlations ranged from .20-.40; these were moderate test correlation. Five items had low item-test correlations value below .20.

Minor hypotheses

It was hypothesized that there is a positive correlation between age of the child and proportion of items passed on which the subject disagreed with the premise. There was a moderate positive correlation of .27 to support this hypothesis. The magnitude of this correlation was small; when it was evaluated in terms of information which indicated that the items were too easy for the population there remains moderate support for the hypothesis. This can be interpreted as meaning that with increasing age, children are more able to argue from a premise with which they do not agree for the purpose of exploration. It provides empirical support for Piaget's hypothesis that children increase in hypothetical reasoning ability with increasing maturity. His hypothesis has been supported as it relates to problems of physical-mechanical nature. These data support the hypothesis when tested with interpersonal relations content.

There was no support for the hypothesis that the number of premises with which the child disagreed would increase with age; the correlation which tested this hypothesis was -.01 which indicates almost no relation.

Briefly recapitulated, it was concluded: (1) that the test of reasoning about interpersonal relations developed in this research had a moderate level of reliability; (2) that the tests of reasoning had a moderate degree of validity with the PMA and teachers' ranks; (3) that higher correlations throughout between grade and other variables, rather than age and other variables, suggested that the ability to reason about interpersonal relations is related to experience as well as maturation; (4) that the low positive correlation between age and proportion of items passed where there was disagreement with the premise, provide some support for the hypothesis of increasing hypothetical reasoning ability with age; and (5) that there is no support for the hypothesis that number of disagreed premises will increase with age.

Limitations

Limitations in this study included the source of the items, the homogeneity of the scores of the population on the reasoning test, the less than optimum reliability of the measure, the possibility of observer bias, and the limited selection of measures available for use as criteria in the validation of the test.

Source of items

The major source for the items was the recorded spontaneous conversations of children who were all middle-class or upper-class in socio-economic background. It appears logical to assume that with probing relative to interpersonal

relations much more would be revealed by the child. There is nothing to suggest that the child, in free, unstructured conversation, would verbalize at a maximum level his reasoning about interpersonal relations. It also would be desirable to have a wider representation in socio-economic background of the children whose conversations were studied.

Population

There was not so great a range in variability among the children in the validation population as among those in the pretest population on reasoning test scores. Homogeneity of population was reflected in the high scores obtained by all of the children in the study. Part of this is due to the easiness of the items; part of the homogeneity of reasoning test scores is due to the somewhat above average ability of the population.

Reliability

The measure of reliability obtained, .65, was a moderate one rather than a high measure. A coefficient of correlation with a magnitude of .80 or above would have been preferable. The reliability measure placed an absolute limit on the validity of the instrument.

Observer bias

The researcher collected both test and validity data. Every effort was made to prevent contamination by compiling no scores until both measures on the subjects were secured.

Choice of criterion

Efforts to choose the best criterion measure were limited because of the small amount of work previously done

in this area. Validity was determined simply in terms of correlation or lack of correlation with PMA tests. The decision to use one form of the PMA for grades one through four in order to reduce lack of comparability between the reasoning test and measure used for validity purposes was arbitrary. The decision meant that first grade children were evaluated against a test not standardized on their grade level. This seemed preferable to the alternative which was the use of two forms of the PMA. Comparability of test and validity measure would have been difficult to determine had the latter alternative been chosen.

Implications

The implications of this research are relevant for two institutions of our society, the school and the home.

For the school

The data give support to the hypothesis that children of early school age are capable of dealing verbally in a logical fashion with matters of interpersonal relations. Matters of wide social concern can be assumed to have their roots in early childhood concepts and the manner of dealing with these concepts; it would be worthwhile for the school to pursue education for the use of logical facility in interpersonal relations as well as in reading comprehension and scientific and mathematical training. Judging the truth of a premise may in many cases become a moral issue; applying logic to a combination of premises belongs always in the

realm of reasoning and can legitimately be pursued.

For the home

Parent educators have tended to emphasize the affective areas of personality while under-emphasizing the cognitive, particularly the cognitive area of reasoning. This aspect should also receive attention. Parents have been given aid in "fitting the punishment to the crime" but less aid in fitting the "logic to the age". Beginning with the establishment of verbal communication there may also begin opportunities for logical learning which are utilized implicitly by the child and which might be used more explicitly and purposefully by parents.

If we are to progress as human beings in the development of reasoned interpersonal relationships rather than unreasoning interpersonal relationships, and in the application of reasoning to social problems, the beginnings must lie in the early home and school life of the child.

Recommendations

This research problem can be fruitfully extended by studies involving three types of research designs; normative, methodological, and experimental.

Studies of the normative types should first of all probe deeply into the concepts about interpersonal relations held by children. Interviews would need to be clinical in approach. A second approach to this type of study would be a historical search for items which reveal concepts about

interpersonal relations as already found in a vast literature on children's concepts in many content areas.

Methodological studies of several types are recommended. The continued refinement of the present instrument is one possibility. The expansion of the measure both to younger and older children is very desirable.

With the availability of this test as a research instrument for which reliability and validity are established several experimental studies become possible. The effect of practice upon the ability to reason about interpersonal relations should be explored. Another closely related study would be that of the effect of training in verbal or communicative ability upon reasoning about interpersonal relations and upon other content areas. This is an extremely important area as it relates to the current effort to break the poverty cycle in this country; poverty of the mind is equally as devastating as poverty of the body and both must often be approached at the same time.

A final recommendation for future research is made which does not involve types of research designs. The recommendation involves the conceptualization of new areas in which problems for research lie. It was emphasized in the introduction to this research that the relation between the cognitive process of reasoning and the personality area of interpersonal relations had received little exploration. There should be continued expansion of research to problems

of the relation between reasoning and other relatively unexplored areas of personality; an example of an unexplored area is the relation between reasoning and creative expression. If man is the reasoning animal, we must find out more about the limits and magnitudes to which this reasoning ability is extended.

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APPENDIXES

APPENDIX A

PRETEST INSTRUCTION

INSTRUCTIONS

Begin by putting the child as much at ease as possible.

Hello, _____. I'm glad to see you today.

_ _ _ _ _ _ _ _ _ _ Pause for response if any _ _ _ _ _ _ .

I want you to help me learn about boys and girls and how they figure out things about people. I will ask you some questions; you can choose an answer from two answers which I will read to you. You should choose what you think is the very best answer.

_ _ _ _ _ _ _ _ _ _ Pause for response if any _ _ _ _ _ _ .

Let's try one, alright? _ _ _ _Pause for response_ _ _ .

Before I give you the first question I want to find out what you think about something.

DO YOU THINK The feet which people have belong to them?

YOU DO THINK The feet which people have belong to them?

THEN Jimmy has two feet.

NOW: TELL ME WHICH IS THE ANSWER:

Jimmy's feet belong to him

Jimmy's feet do not belong to him.

YOU DID A GOOD JOB. LET'S TRY SOME MORE.

APPENDIX A

ITEMS USED IN PRETEST

SET I

Item Number	Content Label	Solution Label	Item Content
1	feel.	cat.	People do not always tell the truth. Sally says, "I hate you." a. Sally may hate you. b. Sally hates you.
2	feel.	cat.	Sharing our toys helps people like us. Johnny shares his bike. a. People like Johnny. b. People do not like Johnny.
3	feel.	cat.	Mothers will help you most of the time. Sally says, "Help Mother, help me." a. Mother will help Sally. b. Mother will not help Sally.
4	feel.	cat.	Sometimes it's more important to try alone and fail than to have help and succeed. Sally works all her arithmetic problems without looking at the answers. a. It may be more important for Sally to try alone and fail than to look. b. It may be more important for Sally to look at the answers and succeed.
5	feel.	cat.	Sometimes it is fun to play alone. Sally plays alone all the time. a. It is fun for Sally to play alone. b. It is not fun for Sally to play alone.
6	feel.	cat.	Pushing someone may be an accident. Sally pushed Jane. a. It may be an accident. b. It was not an accident.

ITEMS USED IN PRETEST

SET I

Item Number	Content Label	Solution Label	Item Content
7	feel.	cat.	When someone is angry with us we often get angry at him. Johnny's father is angry with him. a. Johnny is angry. b. Johnny is not angry.
8	feel.	cat.	Most of the time we can tell what people think by what they say. Sally said to Jane, "You are my friend, Jane." a. Sally is Jane's friend. b. Sally is not Jane's friend.
9	feel.	cat.	When we are angry we often hurt the person at whom we are angry. Johnny is angry at Sam. a. Johnny hurt Sam. b. Johnny did not hurt Sam.
10	feel.	dec.	Most people will help you when you need help. One of the times you need help is when you fall in a deep hole. a. Most people will help you when you fall in a hole. b. Most people will not help you when you fall in a hole.
11	feel.	dec.	When we need help we should ask for help. Sally needs help with her arithmetic problems. a. Sally should ask for help. b. Sally should not ask for help.
12	feel.	dec.	Pushing someone shows that we are angry. Sally pushed Jane. a. Sally is angry. b. Sally is not angry.

ITEMS USED IN PRETEST

SET I

Item Number	Content Label	Solution Label	Item Content
13	feel.	dec.	We do not like for the teacher to catch us making a mistake. Johnny hits Sam. a. Johnny will not like for the teacher to catch him hitting Sam. b. Johnny will like for the teacher to catch him hitting Sam.
14	feel.	dec.	Hitting in a game of wrestling is for fun. Sam hit Johnny in a game of wrestling. a. Sam hit Johnny for fun. b. Sam hit Johnny because he was angry.
15	feel.	dec.	Parents do not like for brothers to hit each other. Johnny hit his brother Sam. a. Johnny's parents will like for him to hit his brother. b. Johnny's parents will not like for him to hit his brother.
16	feel.	dec.	We like people who do things for us. Mrs. Smith makes cookies for the children on her street. a. The children like Mrs. Smith. b. The children do not like Mrs. Smith.
17	feel.	dec.	When we are angry and can't get back at the person who made us angry we hurt someone else. Johnny hurt his little sister who had done nothing to him. a. Johnny was angry at his sister. b. Johnny was angry at somebody though it might not be his sister.

ITEMS USED IN PRETEST

SET I

Item Number	Content Label	Solution Label	Item Content
18	rights	dec.	Most of the time we can help ourselves when boys and girls won't take turns. The children won't give Sally a turn on the swings. a. Sally can help herself. b. Sally can not help herself.
19	rights	dec.	If we have a chance we can sometimes correct our mistakes. The teacher gave Johnny a second try at the arithmetic. a. Johnny may have corrected his mistake. b. Johnny may not have corrected his mistake.
20	rights	cat.	When we loan something to another person we want that person to take care of our thing. Sally loaned her book to her sister. a. Sally wanted her sister to take care of the book which Sally had loaned her. b. Sally did not care what her sister did to her book.
21	rights	cat.	Our clothes belong to us. Sally has on her skirt. a. The skirt belongs to Sally. b. The skirt belongs to Mary.
22	rights	cat.	We like for things to be equally divided. Jane pours herself more Coke than she gives Sally. a. Sally will like this. b. Sally will not like this.

ITEMS USED IN PRETEST

SET I

Item Number	Content Label	Solution Label	Item Content
23	auth.	cat.	It is alright to change the rules in a game if everybody knows the new rules. Johnny taught the rules he made up to his friends. a. The new rules were alright to use. b. The new rules were not alright to use.
24	auth.	cat.	Children are punished by their own parents more than by other grownups. Sally's parents are Mr. and Mrs. Smith. a. Mr. and Mrs. Smith punish Sally more than her neighbor. b. The neighbor punishes Sally more than Mr. and Mrs. Smith.
25	auth.	dec.	Almost always Daddys and Mothers decide when to sell things that belong to the whole family. The family next door sold their lawn mower. a. The Daddy and Mother decided to sell the lawn mower. b. Everybody helped decide to sell the lawn mower.
26	group	cat.	You cannot tell from looking at someone how smart he is. Sally looked at Johnny. a. Johnny is smart. b. Johnny may be smart and he may not be smart.
27	group	cat.	Boys and girls in a room know more about who is someone's boyfriend than the teacher. Sally is in Miss Smith's room. a. Sally knows more about who are the boyfriends than the teacher. b. The teacher knows more about who are the boyfriends than Sally.

ITEMS USED IN PRETEST

SET I

Item Number	Content Label	Solution Label	Item Content
28	group	cat.	Miss or Mrs. is what we call a grown-up who is a girl or a woman. Miss Smith is a grownup. a. Miss Smith is a woman. b. Miss Smith is not a woman.
29	group	dec.	Sometimes a teacher is not pleased with what a (boy) (girl) does. Billy is a boy. a. Sometimes the teacher is not pleased with what Billy does. b. The teacher is never pleased with what Billy does.
30	group	dec.	Most older brothers are bigger than little brothers. Jim is bigger than his brother John. a. Jim is probably older than John. b. John is probably older than Jim.

APPENDIX A

ITEMS USED IN PRETEST

SET II

Item Number	Content Label	Solution Label	Item Content
1	feel.	cat.	Thoughts can be shared with other people by talking about the thoughts. Sally told her mother about what they did in school that day. a. Sally shared her thoughts with her mother. b. Sally did not share her thoughts with her mother.
2	feel.	cat.	We help people by doing things for them. Sally brought the teacher the waste-basket. a. Sally helped the teacher. b. Sally did not help the teacher.
3	feel.	cat.	Some things we have to do by ourself. Sally walks to school a. Sally walks on her own feet. b. Sally walks on somebody else's feet.
4	feel.	cat.	Most boys and girls are happy if they have more toys than their friends. Sally is a girl who has more toys than her friend Jane. a. Sally is happy. b. Sally is not happy.
5	feel.	cat.	People do not always like to have others do the same to them as they did to someone else. Johnny tore Sally's book. a. Sally liked this. b. Sally did not like this.

ITEMS USED IN PRETEST

SET II

Item Number	Content Label	Solution Label	Item Content
6	feel.	cat.	Hitting usually makes someone angry but sometimes hitting is for fun. Sam hit Johnny. a. Johnny will be angry. b. Johnny may be angry but he may not be angry.
7	feel.	cat.	We are sometimes afraid of things which we have never seen before. Johnny has never seen an Indian boy. a. Johnny may be afraid of an Indian boy. b. Johnny is afraid of an Indian boy.
8	feel.	cat.	When we are unhappy we look sad. Johnny looks sad. a. Johnny is happy. b. Johnny is unhappy.
9	feel.	dec.	Almost always it makes us feel good to help somebody else learn. Johnny helped Sammy learn the answers to his arithmetic problems. a. Johnny felt good. b. Johnny felt bad.
10	feel.	dec.	We usually help our friends. Sally's friend needed help to button her coat. a. Sally helped her friend button her coat. b. Sally did not help her friend button her coat.
11	feel.	dec.	It is more fun to play with someone else than to play alone. Sally played with Johnny this afternoon. a. Sally had more fun with Johnny than she would have had alone. b. Sally did not have as much fun with Johnny as she would have had alone.

ITEMS USED IN PRETEST

SET II

Item Number	Content Label	Solution Label	Item Content
12	feel.	dec.	If we like someone we want that person to talk to us. Sally likes Johnny. a. Sally wants Johnny to talk to her. b. Sally does not want Johnny to talk to her.
13	feel.	dec.	When our friends look at us in an angry way it means they do not like what we are doing. Sally looked at John in an angry way. a. Sally does not like what John is doing. b. Sally likes what John is doing.
14	feel.	dec.	Teachers do not like boys to hit each other. The teacher looks at Sam who is ready to hit Johnny. a. The teacher does not like Sam to hit Johnny. b. The teacher will like it if Sam hits Johnny.
15	feel.	dec.	When someone dares us it means he thinks we are afraid. Tommy dared Johnny to walk the board across the ditch. a. Tommy thought Johnny was afraid. b. Tommy thought Johnny was not afraid.
16	feel.	dec.	We have to know a person before he can be our friend. John does not know Jimmy. a. Jimmy can't be Johnny's friend. b. Jimmy is Johnny's friend.

ITEMS USED IN PRETEST

SET II

Item Number	Content Label	Solution Label	Item Content
17	rights	dec.	A person who can not help the team win is usually not chosen to play. Johnny can't help the team win the race for he is a slow runner. a. Johnny will not be chosen. b. Johnny will be chosen.
18	rights	dec.	The clothes we wear usually belong to us. Sally is wearing a skirt. a. The skirt belongs to Sally. b. The skirt may belong to Sally but it may belong to someone else.
19	rights	cat.	My ideas belong to me just as my toys belong to me. In school Sally had an idea for a picture she drew. a. Sally's idea belonged to her. b. Sally's idea did not belong to her.
20	rights	cat.	When children won't take turns they need someone to teach them. Johnny won't take turns. a. Someone needs to teach Johnny to take turns. b. No one needs to teach Johnny to take turns.
21	rights	cat.	The teacher can help us when boys and girls won't take turns. Sally said, "Teacher, will you make them give me a turn?" a. The teacher can help Sally b. The teacher can not help Sally.

ITEMS USED IN PRETEST

SET II

Item Number	Content Label	Solution Label	Item Content
22	auth.	cat.	Parents expect us to do what they say. Mother said, "Cross the street only at a stop light." a. Mother expects you to cross at the stop light. b. Mother doesn't care when you cross.
23	auth.	cat.	Parents punish their own children more than they punish children who visit in their house. Sally is visiting with Betty Brown. a. Mrs. Brown will punish Betty more than Mrs. Brown will punish Sally. b. Mrs. Brown will punish Sally and Betty the same.
24	auth.	dec.	Teachers are usually right about school work. Miss Smith is a teacher. a. Miss Smith is usually right about school work. b. Miss Smith is usually right about school work but she may be wrong sometimes.
25	group	cat.	What a person does helps you decide if the person is smart about the things he is doing. Almost always Johnny gets the right answer to the teacher's questions. a. Johnny is smart about everything. b. Johnny is smart about the questions the teacher asks.
26	group	cat.	There are two kinds of persons, boys and girls. Sally is a girl. a. Sally is a person. b. Sally is not a person.

ITEMS USED IN PRETEST

SET II

Item Number	Content Label	Solution Label	Item Content
27	group	cat.	The team with the slowest runners will lose the race. Johnny is slower than any of the runners. a. The team with Johnny will win the race. b. The team with Johnny will lose the race.
28	group	dec.	Most grownups are nice to boys and girls. Miss Smith is a grownup. a. Miss Smith is nice to boys and girls. b. Miss Smith is not nice to boys and girls.
29	group	dec.	Most grownups know more than children. A policeman is a grownup. a. A policeman knows more than children. b. A policeman does not know more than children.

APPENDIX A

ITEMS USED IN PRETEST

SET III

Item Number	Content Label	Solution Label	Item Content
1	feel.	cat.	It hurts a person's feelings not to be chosen to play in a game. Sally was not chosen. a. Sally had hurt feelings. b. Sally did not have hurt feelings.
2	feel.	cat.	We cannot share our thoughts if we never talk to people. Johnny will not talk to Sam. a. Johnny does not share his thoughts with Sam. b. Johnny does share his thoughts with Sam.
3	feel.	cat.	Teachers help boys and girls who need help. Jane said to her teacher, "Help me with this word." a. Teacher helped Jane. b. Teacher did not help Jane.
4	feel.	cat.	Sometimes we don't know that we need help. Sally worked her arithmetic problems and did not know they were wrong. a. Sally didn't know she needed help. b. Sally knew she needed help.
5	feel.	cat.	Sometimes we use other ways than what the people have done to us to hurt those people. Johnny pushed Sally down in the mud. a. Sally told the teacher on Johnny. b. Sally did nothing to Johnny.

ITEMS USED IN PRETEST

SET III

Item Number	Content Label	Solution Label	Item Content
6	feel.	cat.	Most of the time we know what will make someone angry. Sam has a brother. a. Sam knows what will make his brother angry. b. Sam does not know what will make his brother angry.
7	feel.	cat.	Even people we like are not always kind to us. Mother punished Bill a. Mother is not always kind to Bill. b. Mother is always kind to Bill.
8	feel.	cat.	When we are happy we often smile. Johnny is smiling. a. Johnny is happy. b. Johnny is not happy.
9	feel.	dec.	We should be happy if other people use our things in the same way we use them. Sally tears up her books. a. Sally should be happy if Bill tears up her books. b. Sally should not be happy if Bill tears up her books.
10	feel.	dec.	We usually share our things with our friends. Johnny has two red pencils. a. Johnny will share his pencils. b. Johnny will not share his pencils.
11.	feel.	dec.	We don't like for other people to have more than we have. Johnny has two boxes of crayons, Sally has no crayons. a. Sally doesn't like for Johnny to have two boxes of crayons. b. Sally likes for Johnny to have two boxes of crayons.

ITEMS USED IN PRETEST

SET III

Item Number	Content Label	Solution Label	Item Content
12	feel.	dec.	Throwing water at someone is one of the things which makes a person look at you. Johnny threw water on Sally. a. Sally looked at Johnny. b. Sally did not look at Johnny.
13	feel.	dec.	When parents look at us in a certain way it means, "Don't do what you are doing." Johnny's daddy looked at him in that certain way. a. Johnny's daddy meant, "Don't do what you are doing." b. Johnny doesn't know what his daddy means.
14	feel.	dec.	Boys do not like to be hit. Sam hit Johnny. a. Johnny will like to be hit by Sam. b. Johnny will not like to be hit by Sam.
15	feel.	dec.	We don't like people who are never kind to us. Mr. Smith always chases the boys away from his house. a. The boys like Mr. Smith. b. The boys do not like Mr. Smith.
16	feel.	dec.	The things people say and do tell us something about them. Sally says Jane is her friend and she often invites Jane to play with her. a. Jane is Sally's friend. b. Jane is not Sally's friend.

ITEMS USED IN PRETEST

SET III

Item Number	Content Label	Solution Label	Item Content
17	rights	dec.	A person who can help the team win is usually chosen to play. Johnny is a fast runner and can help win the race. a. Johnny will be chosen. b. Johnny will not be chosen.
18	rights	dec.	When children don't take turns it is usually because they think no one will make them. Johnny won't take turns. a. Johnny thinks no one will make him take turns. b. Johnny thinks someone will make him take turns.
19	rights	cat.	When children your age don't take turns on the swings they know it isn't fair. Bobby won't take turns on the swing. a. Bobby knows it isn't fair. b. Bobby does not know it isn't fair.
20	rights	cat.	Not all things belong to a person, some things belong to a family. There is something in the garage next door. a. The something belongs to the family next door. b. The something may belong to the family.
21	auth.	cat.	To trade means to give one thing and receive something else. Mary offers to give Sally some Fritos if Sally will roll the ball to her. a. Mary is trading Fritos for a turn. b. Mary is sharing her Fritos with Sally.

ITEMS USED IN PRETEST

SET III

Item Number	Content Label	Solution Label	Item Content
22	auth.	cat.	Everybody has to play a game with the same rules to be fair. Johnny makes up his own rules. a. Johnny is fair to the other people in the game. b. Johnny is not fair to the other people in the game.
23	group	cat.	A person may look dumb but that does not mean he is dumb. Johnny looks dumb. a. Johnny is dumb. b. Johnny may or may not be dumb.
24	group	cat.	Children are neither babies or grown-ups. Susan is a baby. a. Susan is not a child. b. Susan is a child.
25	group	cat.	Noise can disturb people who are listening to sounds. "Sh.....," said John to people around the record player. a. The noise was disturbing John. b. The noise was not disturbing John.
26	group	dec.	Most children have the same last name as their father. Betty's father is Mr. Brown. a. Betty's name is Betty Brown. b. Betty's name may be Betty Brown but it does not have to be.
27	group	dec.	Most teachers know more about teaching children how to read than Mothers. Miss Smith is a teacher. a. Miss Smith teaches boys and girls how to read. b. Miss Smith does not teach children how to read.

APPENDIX A

ITEMS USED IN PRETEST

SET IV

Item Number	Content Label	Solution Label	Item Content
1	feel.	cat.	It makes us feel good to know a riddle that others do not know. Johnny knows a riddle that Sammy doesn't know. a. Johnny feels good. b. Johnny does not feel good.
2	feel.	cat.	We share our thoughts when we play (cop and robber) or (mother and daddy). Sally is playing mother and daddy with Jane. a. Sally is sharing her thoughts. b. Sally is not sharing her thoughts.
3	feel.	cat.	Teachers help boys and girls learn to read. Miss Smith is a teacher. a. Miss Smith helps boys and girls learn to read. b. Miss Smith does not help boys and girls learn to read.
4	feel.	cat.	Some people don't want help even when they need it. Sally cannot work her problems but she will not ask the teacher. a. Sally needs help. b. Sally does not need help.
5	feel.	cat.	When we are standing in a line of people and push someone it is usually an accident. John pushes Jim while they are standing in a line going to get a drink of water. a. It is an accident. b. It is not an accident.

ITEMS USED IN PRETEST

SET IV

Item Number	Content Label	Solution Label	Item Content
6	feel.	cat.	Most of the time we try to hurt people who hurt us. Johnny pushed Sally down in the mud. a. Sally will push Johnny down in the mud. b. Sally will not push Johnny down in the mud.
7	feel.	cat.	We usually like people who help us. Sally brings a book to the teacher. a. The teacher likes Sally. b. The teacher does not like Sally.
8	feel.	cat.	Getting an ice cream cone usually makes us happy. Johnny got an ice cream cone. a. Johnny is happy. b. Johnny is not happy.
9	feel.	dec.	Being part of the team is important to all people. Johnny does not run quickly and will not help win the race. a. Johnny will be chosen on a team. b. Johnny will not be chosen on a team.
10.	feel.	dec.	Some people will help you when you need help. One of the times you need help is when you drop your books. a. Some people will help you when you drop your books. b. Some people will not help you when you drop your books.
11	feel.	dec.	All people need help from other people. Sally cannot work her arithmetic problems. a. Sally needs help. b. Sally does not need help.

ITEMS USED IN PRETEST

SET IV

Item Number	Content Label	Solution Label	Item Content
12	feel.	dec.	Something can be so exciting that we will want to be interrupted to hear about it. Seeing a man parachute out of a plane is exciting. a. We will want to be interrupted to hear about it. b. We will not want to be interrupted to hear about it.
13	feel.	dec.	People don't like us to bother them by putting our feet on them. John put his feet on Sally. a. Sally liked this. b. Sally did not like this.
14	feel.	dec.	People do not like to be disturbed by others. Sam disturbed his brother who was reading a book. a. Sam's brother did not like to be disturbed. b. Sam's brother liked to be disturbed.
15	feel.	dec.	We like for people to say nice things about us. "That's a nice picture which you drew," said Mary to Sally. a. Sally liked what Mary said. b. Sally did not like what Mary said.
16	feel.	dec.	Everyone likes to have friends. Sally is Jane's friend. a. Jane likes this. b. Jane doesn't like this.

ITEMS USED IN PRETEST

SET IV

Item Number	Content Label	Solution Label	Item Content
17	rights	dec.	Some things which we carry with us do not belong to us. Sally carried her brother's book to school. a. The book belongs to Sally. b. The book does not belong to Sally.
18	rights	dec.	Some things which we carry with us belong to us. Sally carried her book to school. a. The book belongs to Sally. b. The book does not belong to Sally.
19	rights	dec.	Most children your age know about taking turns when playing. Sally and Bobby are the same age which you are. a. Sally and Bobby know about taking turns. b. Sally and Bobby do not know about taking turns.
20	rights	cat.	The teacher said, "Use your own ideas for a picture." Johnny copied the picture which Sally drew. a. Johnny used his own ideas. b. Johnny did not use his own ideas.
21	rights	cat.	Things which are borrowed are to be returned to the owner. Johnny loaned his red pencil to his friend. a. The red pencil is to be returned to Johnny. b. The red pencil is not to be returned to Johnny.

ITEMS USED IN PRETEST

SET IV

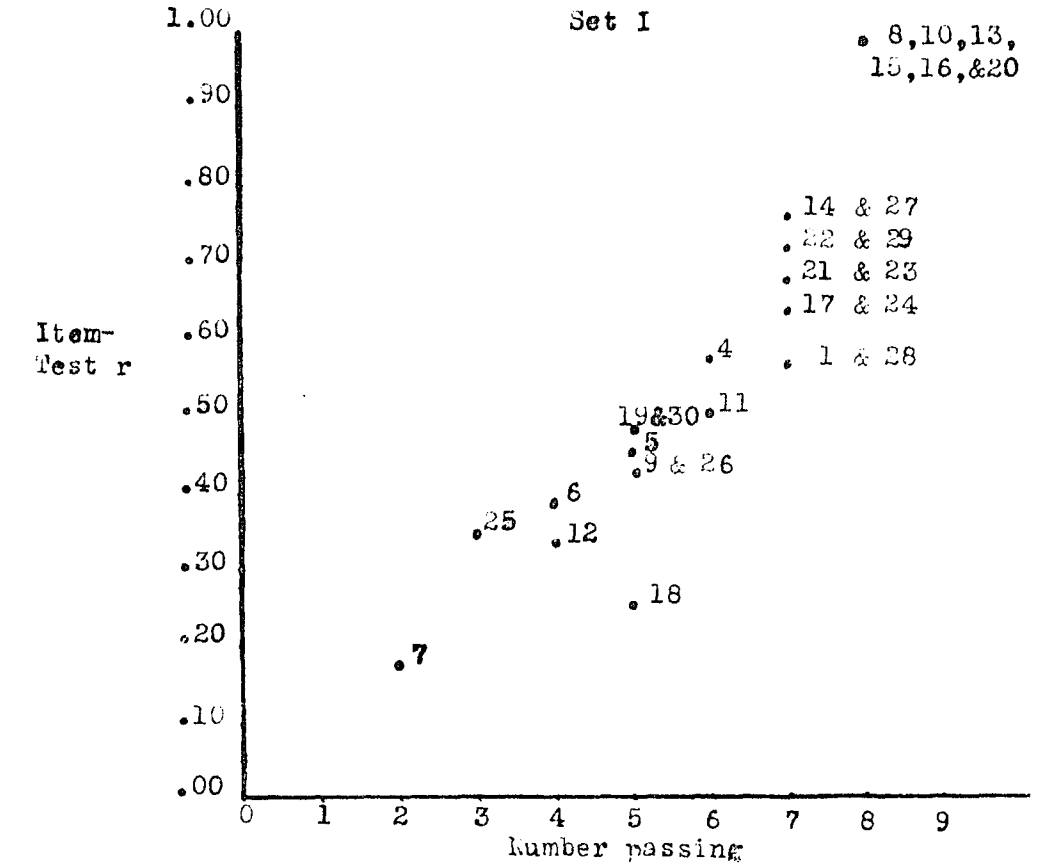
Item Number	Content Label	Solution Label	Item Content
22	rights	cat.	A television is one of those things that belong to a family. There is a television in the house next door. a. The television belongs to the family next door. b. The television belongs to the father next door.
23	auth.	cat.	People who make up their own rules are not liked in playing games. Johnny makes up his own rules. a. Johnny is liked by other people in playing games. b. Johnny is not liked by other people in playing games.
24	group	cat.	Not all teachers teach children how to read. Mr. Burton is a football teacher. a. Mr. Burton teaches children how to read. b. Mr. Burton does not teach children how to read.
25	group	cat.	You can tell something about how smart a person is by what he does. Johnny's skin is very black and he almost always knows the answers to the teacher's questions. a. Johnny is smart. b. Johnny is not smart.
26	group	cat.	Not all boys and girls of the same age are the same size. Susan and Jane are the same age. a. Susan and Jane are the same size. b. Susan and Jane may be the same size.

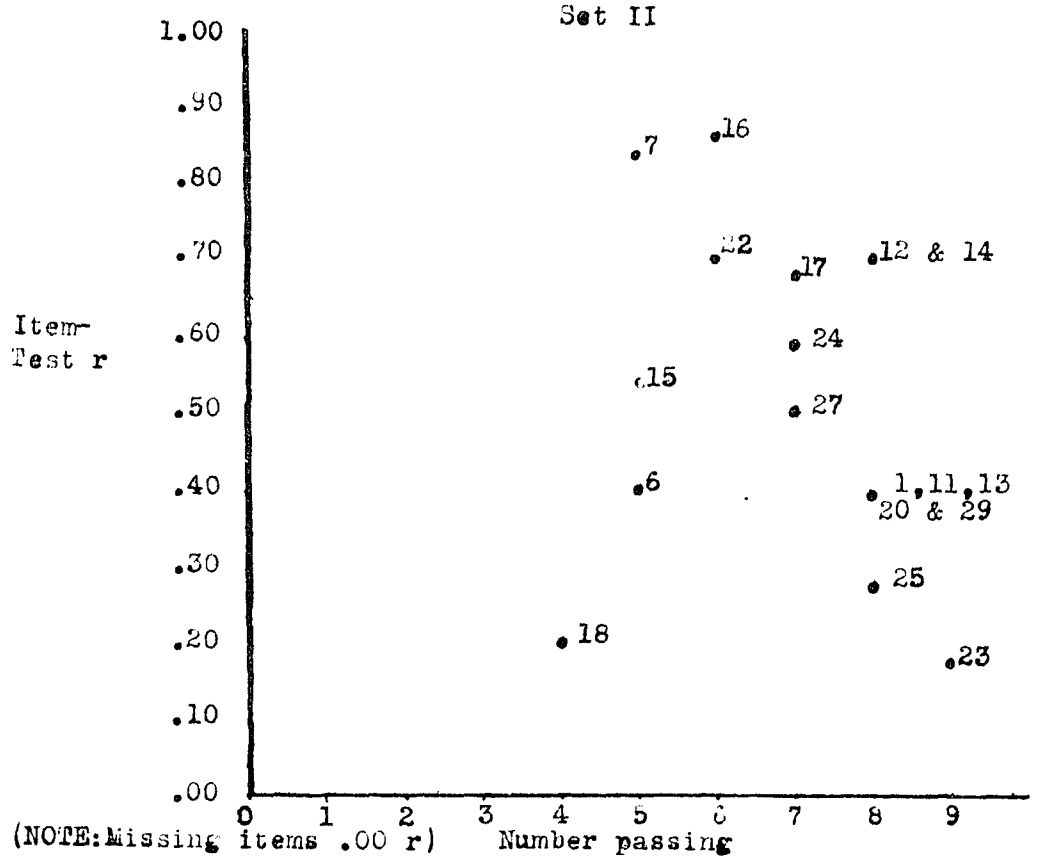
ITEMS USED IN PRETEST

SET IV

Item Number	Content Label	Solution Label	Item Content
27	group	dec.	Most children are the same color of skin as their father. Sally's father has white skin. a. Sally's skin is white. b. Sally's skin may be white but it may not be.
28	group	dec.	Most teachers are nice to their pupils. Miss Smith is a teacher. a. Miss Smith is nice to her pupils. b. Miss Smith is not nice to her pupils.

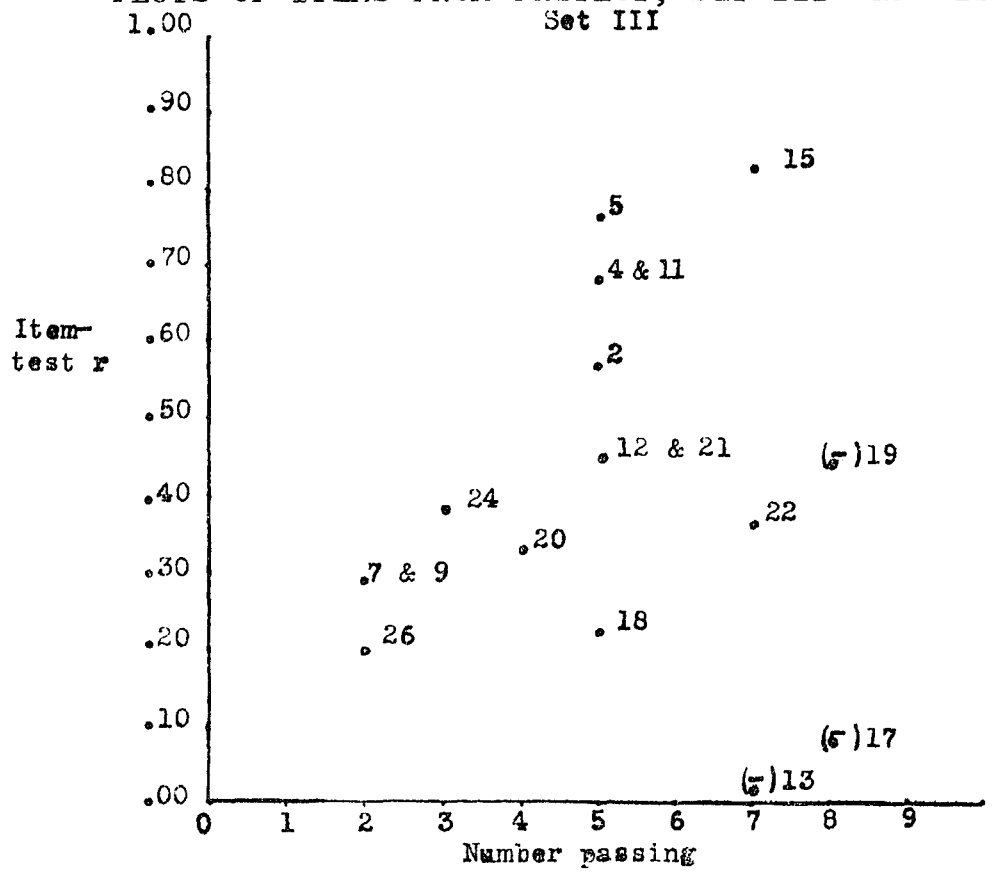
PLOTS OF ITEMS FROM PRETEST, SET I AND SET II

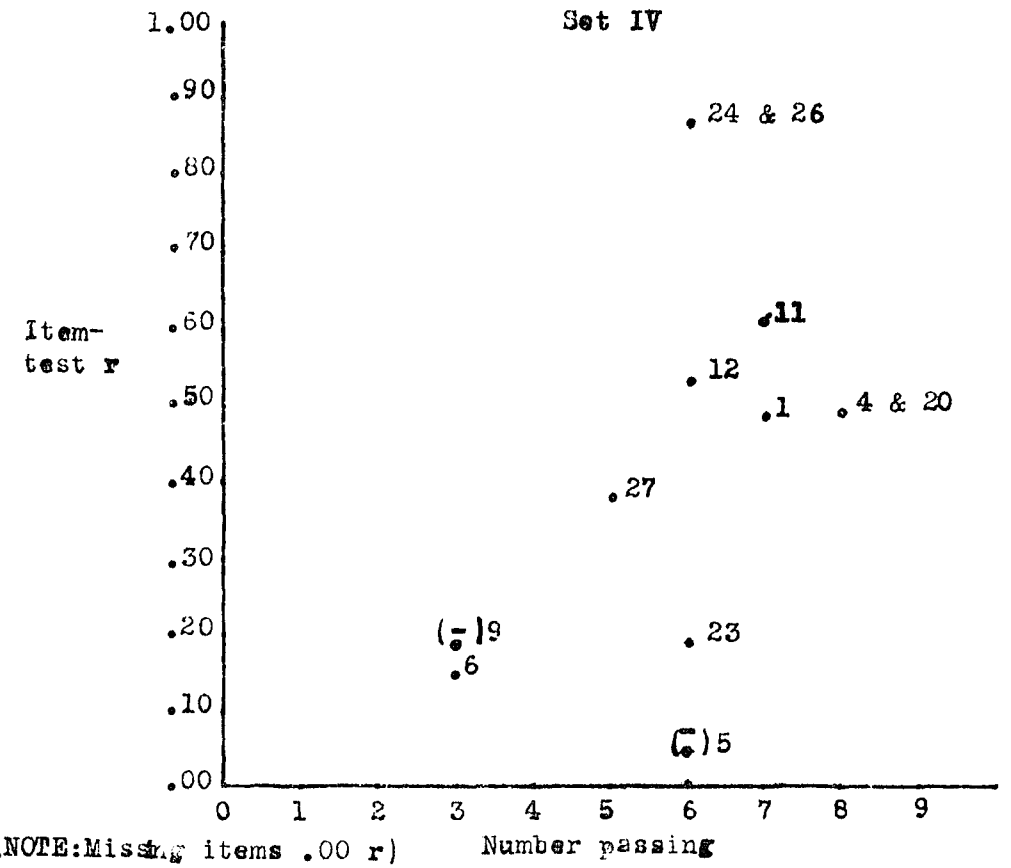




(NOTE: Missing items .00 r)

PLOTS OF ITEMS FROM PRETEST, SET III AND SET IV





(NOTE: Missing items .00 r)

APPENDIX B

INSTRUCTIONS USED IN FINAL RESEARCH MEASURES

INSTRUCTIONS

Begin by putting the child as much at ease as possible. Chat briefly if desired.

Hello, _____. I'm glad to see you today.

You are_____years old, is that right?

_ _ _ _ _ _ _ Pause for response if any_ _ _ _ _.

I want you to help me learn about boys and girls and how they figure out things about people. I know you can help me. This is what we'll do. First, I want to find out what you think about a sentence--if you agree or disagree. Then, I will read to you again. Next there will be two answers and I want you to choose the correct answer. (The one you think is right, may be added for younger children.)

Let's try one. Alright? _ _ _ _ _ Pause for response_ _ _.

We can see if you understand what to do by trying one.

_ _ _ _ _ _ _ Pause for response if any_ _ _ _ _ _.

DO YOU THINK The feet which people have belong to them?

YOU DO THINK The feet which people have belong to them.

(The children usually smile if you smile when saying this.)

THEN Jimmy has two feet.

NOW TELL ME, WHICH IS THE CORRECT ANSWER

Jimmy's feet belong to him

Jimmy's feet do not belong to him

INSTRUCTIONS USED IN FINAL RESEARCH MEASURES

After the child responds say YOU DID A GOOD JOB. LET'S TRY SOME MORE. OK? If he did not understand, go through the same item again. If he did not agree with the premise in the example, add or change the premise and conclusions to ones he will accept. For example, if he says his feet belong to God, change the major premise:

SAY: The feet which people have belong to them and God.
Jimmy has two feet.
a. Jimmy's feet belong to him and God.
b. Jimmy's feet do not belong to him and God.

- -

Note: Reinforce child at end of items 1, 5, 12, 19, 25. An "R" is printed at the bottom of the card for those item numbers to remind you.

SAY: You did a good job or, That's fine,_____.
Do not tell child he was right or wrong, even if he asks you.

- -

Complete the interview.

CLOSE WITH: Thank you very much_____. You are finished. You did a very good job. I appreciate your help.

APPENDIX B

ITEMS USED IN FINAL RESEARCH MEASURE

Item Number	Content Label	Solution Label	Item Content
1	soc.	cat.	Our clothes belong to us. Sally has on her skirt. a. The skirt belongs to Sally. b. The skirt belongs to Mary.
2	soc.	cat.	Parents expect us to do what they say. Mother said, "Cross the street only at a stop light." a. Mother expects you to cross at the stoplight. b. Mother doesn't care where you cross.
3	soc.	cat.	Children are punished by their own parents more than by other grownups. Sally's parents are Mr. & Mrs. Smith. a. Mr. and Mrs. Smith punish Sally more than the neighbor. b. The neighbor punishes Sally more than Mr. and Mrs. Smith.
4	soc.	cat.	To trade means to give one thing and receive something else. Mary offers to give Sally some Fritos if Sally will roll the ball to her. a. Mary is trading Fritos for a turn. b. Mary is sharing her Fritos with Sally.
5	soc.	dec.	If we have a chance we can sometimes correct our mistakes. The teacher gave Johnny a second try at the arithmetic. a. Johnny corrected his mistake. b. Johnny may have corrected his mistake.

ITEMS USED IN FINAL RESEARCH MEASURE

Item Number	Content Label	Solution Label	Item Content
6	soc.	cat.	It is alright to change the rules in a game if everybody knows the new rules. Johnny taught the rules he made up to his friends. a. The new rules were alright to use. b. The new rules were not alright to use.
7	soc.	cat.	A person who cannot help the team win is usually not chosen to play. Johnny can't help the team win the race for he is a slow runner. a. Johnny will be chosen. b. Johnny will not be chosen.
8	class.	cat.	Miss or Mrs. is what we call a grownup who is a girl or a woman. Miss Smith is a grownup. a. Miss Smith is a woman. b. Miss Smith is not a woman.
9	class.	dec.	You cannot tell from looking at someone how smart he is. Sally looked at Johnny. a. Johnny is smart. b. Johnny may be smart.
10	class.	cat.	Not all teachers teach children how to read. Mr. Ellis is a football teacher. a. Mr. Ellis teaches children how to read. b. Mr. Ellis does not teach children how to read.
11	class.	cat.	The team with the slowest runners will lose the race. Johnny is slower than any of the runners. a. The team with Johnny will win the race. b. The team with Johnny will lose the race.

ITEMS USED IN FINAL RESEARCH MEASURE

Item Number	Content Label	Solution Label	Item Content
12	class.	dec.	Not all boys and girls of the same age are the same size. Susan and Jane are the same age. a. Susan and Jane are the same size. b. Susan and Jane may be the same size.
13	class.	cat.	Most older brothers are bigger than younger brothers. Jim is bigger than his brother John. a. Jim is older than John. b. John is older than Jim.
14	feel.	cat.	We like for things to be equally divided. Jane pours herself more Coke than she gives Sally. a. Sally will like this. b. Sally will not like this.
15	feel.	cat.	We don't like for other people to have more than we have. Johnny has two boxes of crayons; Sally has no crayons. a. Sally doesn't like for Johnny to have two boxes of crayons. b. Sally likes for Johnny to have two boxes of crayons.
16	feel.	cat.	We don't like people who are never kind to us. Mr. Smith always chases the boys away from his house. a. The boys like Mr. Smith. b. The boys do not like Mr. Smith.
17	feel.	cat.	We have to know a person before he can be our friend. John does not know Jimmy. a. Jimmy can't be John's friend. b. Jimmy is John's friend.

ITEMS USED IN FINAL RESEARCH MEASURE

Item Number	Content Label	Solution Label	Item Content
18	feel.	cat.	It makes us feel good to know a riddle that others do not know. Johnny knows a riddle that Sammy doesn't know. a. Johnny feels good. b. Johnny does not feel good.
19	feel.	cat.	We cannot share our thoughts if we never talk to people. Johnny will not talk to Sam. a. Johnny does share his thoughts with Sam. b. Johnny does not share his thoughts with Sam.
20	feel.	dec.	People do not always tell the truth. Sally says, "I hate you." a. Sally may hate you. b. Sally hates you.
21	feel.	dec.	(ALTERNATE FOR BOY) Sometimes a teacher is not pleased with what a boy does. Billy is a boy. a. Sometimes the teacher is not pleased with what Billy does. b. The teacher is never pleased with what Billy does.
21	feel.	dec.	(ALTERNATE FOR GIRL) Sometimes a teacher is not pleased with what a girl does. Mary is a girl. a. Sometimes the teacher is not pleased with what Mary does. b. The teacher is never pleased with what Mary does.
22	feel.	dec.	Pushing someone may be an accident. Sally pushed Jane. a. It may have been an accident. b. It was not an accident.

ITEMS USED IN FINAL RESEARCH MEASURE

Item Number	Content Label	Solution Label	Item Content
23	feel.	cat.	Hitting in a game of wrestling is for fun. Sam hit Johnny in a game of wrestling. a. Sam hit Johnny for fun. b. Sam hit Johnny because he was angry.
24	feel.	cat.	All people need help from other people. Sally cannot work her arithmetic problems. a. Sally needs help. b. Sally does not need help.
25	feel.	cat.	Sometimes we don't know that we need help. Sally worked her arithmetic problems and did not know they were wrong. a. Sally knew she needed help. b. Sally didn't know she needed help.
26	feel.	cat.	When we need help we should ask for help. Sally needs help with her arithmetic problems. a. Sally should ask for help. b. Sally should not ask for help.
27	feel.	dec.	We are sometimes afraid of things which we have never seen before. Johnny has never seen an Indian boy. a. Johnny may be afraid of an Indian boy. b. Johnny is afraid of an Indian boy.
28	feel.	cat.	When someone dares us it means he thinks we are afraid. Tommy dared Johnny to walk the board across the ditch. a. Tommy thought Johnny was afraid. b. Tommy thought Johnny was not afraid.

ITEMS USED IN FINAL RESEARCH MEASURE

Item Number	Content Label	Solution Label	Item Content
29	feel.	dec.	When we are angry we often hurt the person at whom we are angry. Johnny is angry at Sam. a. Johnny hurt Sam. b. Johnny did not hurt Sam.
30	feel.	cat.	When we are angry and can't get back at the person who made us angry, we hurt someone else. Johnny hurt his little sister who had done nothing to him. a. Johnny was angry at his sister. b. Johnny was angry at somebody though it might not be his sister.

APPENDIX B

ITEMS FROM PRETEST RETAINED IN FINAL TEST AND ITEM NUMBER ASSIGNED

Set I		Set II		Set III		Set IV	
Original Item Number	Final Item Number	Original Item Number	Final Item Number	Original Item Number	Final Item Number	Original Item Number	Final Item Number
1	20	7	27	2	19	1	18
4	omit	15	28	4	25	11	24
5	omit	16	17	5	omit	12	omit
6	22	17	7	11	15	24	10
9	29	22	2	12	omit	26	12
11	26	27	11	15	16		
14	23			21	4		
17	30						
19	5						
21	1						
22	14						
23	6						
24	3						
26	9						
27	omit						
28	8						
29	21						
30	13						

APPENDIX B

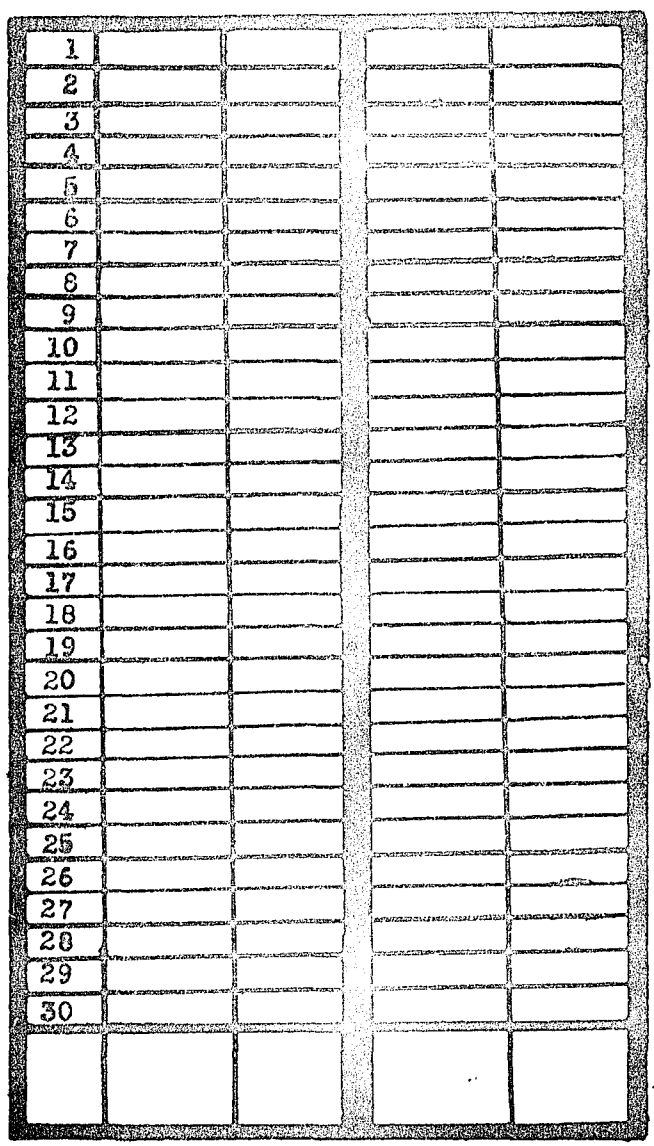
FORM USED FOR RECORDING ANSWERS

Name _____

Grade _____

Birthdate _____

Age _____ Sex _____



APPENDIX B

LETTER OF INSTRUCTIONS TO TEACHERS FOR OBTAINING RANKS

Greensboro, North Carolina

March 1, 1965

Dear Teachers,

You have been so generous with your help that I hesitate to make this additional request; however, the lure of research has prompted me to do so.

Please take 15 minutes of your time to take the names of your students which are enclosed in this envelope, each written on a separate card, and arrange these names in descending order. Begin with the name which you feel is the child who reasons best about interpersonal relations. (I mean by reasoning, the ability to take two pieces of information which together will enable the child to reach a conclusion about an event involving people.) After you have placed the names in order, number the cards from 1 to 28 (1-whatever number of children you have in your class). REMEMBER, NUMBER EACH CARD IN ORDER WHICH YOU HAVE PLACED IT, 1--. BE SURE TO PUT NUMBER 1 ON THE CARD OF THE CHILD WHICH YOU FEEL REASONS BEST.

Please do this within the 15 minutes so that it does not become a burden to you. Please finish by 2 p.m., March 8. I will pick up the envelope at that time. Thank you so very much.

Sincerely,