DOCUMENT RESUME

ED 100 945 95 TM 003 927

AUTHOR McDaniel, Ernest D.; And Others
TITLE Longitudinal Study of Elementary School Effects: Design, Instruments, and Specifications for a Field Test. Final Report.
INSTITUTION Purdue Univ., Lafayette, Ind. Educational Research Center.
SPONS AGENCY National Center for Educational Statistics (DHEW/OE), Washington, D.C.
PUB DATE Dec 73
CONTRACT OEC-0-725283
NOTE 348p.; For the instruments used in the study, see TM 003 928-938 and 996. Not available in hard copy due to marginal legibility of the original document

EDRS PRICE MF-$0.75 HC Not Available from EDRS. PLUS POSTAGE
DESCRIPTORS *Cognitive Development; Disadvantaged Youth; Educational Development; Elementary Education; Elementary Schools; *Elementary School Students; Family Influence; Field Studies; Gifted; *Growth Patterns; Handicapped Children; Longitudinal Studies; Parent Attitudes; Parent Role; Personality Development; Program Effectiveness; Racial Differences; Research Design; Rural Youth; School Attitudes; School Environment; Self Concept; *Social Development; Social Differences; Statistical Analysis; Teaching Methods; Teaching Styles; *Tests
IDENTIFIERS Longitudinal Study of Elementary School Effects

ABSTRACT

Patterns of cognitive, affective, and social growth of elementary school children are described and the school and home variables which influence such growth are identified in this longitudinal study. This final report presents the final instruments and the interpretive data associated with them. The study permits the tracing of developmental patterns for children in general and for special subgroups, such as poor, black, handicapped, gifted, inner city, or rural children. The impact of various teaching styles and instructional strategies is investigated. A more complete understanding of the role played by parental attitudes in the child's achievement, attitude toward school, self-concept, and social development is furnished. Finally, the study offers opportunities to investigate the complex interactions among home, school, and student variables as they evolve through the elementary school years. Variables chosen for investigation were selected from a wide range of potential variables describing the child, his home, and the school. The 15 instruments which were selected or developed to measure the variables in the study are described, and some descriptive statistics are provided. Sampling plans, the testing sequence and schedule, and the data collection and analysis are described. (RC)

Longitudinal Study of Elementary School Effects:

Design, Instruments, and Specifications for a Field Test

Final Report
December 1973

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Contract OEC-0-725283
National Center for Educational Statistics
United States Office of Education

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Acknowledgments

A number of people provided substantial assistance in the planning and preparation of this report. Initial planning benefited from the contributions of William Charlesworth, Institute for Child Development, University of Minnesota; Walter Emmerich, Educational Testing Service, Princeton, New Jersey; Virginia Shipman, Educational Testing Service; Irving Siegel, Department of Psychology, State University of New York at Buffalo; Charles Smock, Department of Psychology, University of Georgia; and Susan Stodolsky, Department of Education, University of Chicago.

Robert Havighurst, Professor of Education and Human Development, University of Chicago, assisted in the evaluation and critique of our early position paper defining the study. Mary P. Endres, Vice President, Governors State University, assisted in the development of the parent questionnaires. Ralph Bentley, Department of Education, Purdue University, assisted with parts of the initial teaching questionnaire. Leon Gleser, Department of Statistics, Purdue University, provided continuing assistance with statistical analysis and development of the analysis plans. Jane Stallings, Stanford Research Institute, Menlo Park, California, suggested procedures for developing observation systems. Herbert J. Walberg, College of Education, University of Illinois at Chicago, and Barak Rosenshine, Bureau of Educational Research, University of Illinois at Urbana-Champaign, in addition to assisting in the development of the study, wrote critiques of the final draft. Critiques of the final draft also were prepared by Alfred L. Baldwin, Department of Psychology, Cornell University; Robert L. Ebel, College of Education, Michigan State University; and Elizabeth Hagen, Teachers College, Columbia University.

The following research assistants at Purdue University worked on the literature review and the development of the instruments: Karen Beutel, Robert Bodine, Barbara Carruthers, William Coward, Peter Denner, Linda Foland, Paula Frump, Thomas Holsworth, Jr., Kevin Hynes, Carol Kay, Camille Little, Robert Meier, Nancy Parsons, Lida Rygas, Carol Schilling, Rob Selvage, Robert Stein, Marjorie Turley, and Fred Widlak.

The study was made much easier by the generous participation of teachers, principals and school administrators of various Indiana school systems: Attica, Battle Ground, Indianapolis, Kokomo, Lafayette, Monon, Remington and Rossville. Mrs. Phyllis Willman typed the manuscript and supervised the preparation of all tables.

William B. Fetters, National Center for Educational Statistics, was the Project Director for USOE. The work described in this Final Report was the responsibility of the following professional staff at Purdue University:

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Preface

Initial planning for a longitudinal study of young children and their development grew out of a survey of educational policy makers and researchers conducted in 1968 by the National Center for Educational Statistics to determine research needs. Attempts to identify a focus for the study culminated in a conference at the Mayflower Hotel, Washington, D.C. in April 1970. The Mayflower Conference Summary recommended that the study investigate the psychological impact of schooling as well as the intellectual impact. The Summary also suggested focusing on the unique set of interactions between pupil characteristics, instructional programs and teaching behavior.

In July, 1970, a contract was awarded the American Institute of Research (AIR), Palo Alto, California for identification of critical variables for the study and the design of tests and questionnaires. In July, 1972, a contract was awarded the Purdue Educational Research Center for further development of tests and plans for the study. In October, 1972, the Purdue Educational Research Center issued a position paper presenting a design for the study and a supporting rationale. The position paper reflected the research literature, the work of AIR, the reactions of USOE consultants to the AIR reports and the thinking of child development and educational research specialists forming a Purdue consultant panel. The position paper was elaborated into a document, Specifications for a Field Study, submitted to USOE in February, 1973.

In July, 1973, a 411 page draft of the Final Report was submitted to USOE. The July draft presented the design of the study and discussed unresolved design issues. The major portion of the draft detailed the selection and development of instruments for data collection. Results of a preliminary trial of 16 instruments with first and fourth grade inner city children were presented. This draft was reviewed by five prominent individuals in the areas of child development, measurement and research design. On the basis of their critiques and further study by the project staff, this Final Report was completed.

This Final Report differs from the draft in several respects. The design of the study continued to evolve in the direction of greater simplification and instruments which failed to survive preliminary trials were dropped from further consideration. Three instruments underwent major modifications: Class Observation Form (now Teacher Observation Scales), Pupil Rating Scale (now Pupil Description of Teaching) and Teacher Questionnaire 2 (now Teacher Questionnaire).

While the first draft of the Final Report provided detailed descriptions and item statistics for all preliminary forms, the current report presents only the final instruments and the statistics associated with the final instruments. Hopefully this more succinct document will provide an efficient blueprint for those who carry the study forward.

Design of the Longitudinal Study of Elementary School Effects

This study is designed to describe patterns of cognitive, affective and social growth among elementary school children and to identify the school and home variables which influence such growth. The study will seek answers to two kinds of questions: How do children grow and develop during the elementary school years? What are the school and home influences affecting this growth?

Children in grades I through 6 will be tested in the fall and spring of the initial year of the study. Intensive data will be collected about the home background of the children and the characteristics and behavior of the classroom teacher. During the two subsequent years, data will be collected from a limited sample of children who originally were tested in grades I and 4. By linking the three year segment of growth from the first grade group and the three year segment from the fourth grade group, a picture of development spanning the six elementary school years will be obtained. Figure I provides a graphic representation of the design of the study.

Data collected during the initial year will provide for description and analysis of the home and school variables related to achievement and personal-social development. In addition, cross-sectional comparisons can be made between achievement and personal-social development of children at six different grade levels. For these studies, the classroom group will be the unit of analysis.

During subsequent years the study will concentrate on longitudinal analysis. It will be concerned with stability and change in patterns of school achievement, affective development and social growth. For these studies, the individual child will be the unit of analysis.

The study should help answer a wide variety of questions related to child development and instructional processes. It will permit the tracing of developmental patterns for children in general and for special subgroups, such as black, poor, handicapped, gifted, inner city or rural children. It will permit investigation of the impact of various teaching styles and instructional strategies. It will lead to a more complete understanding of the role played by parental attitudes in the child's achievement, attitude toward school, self-concept and social development. Finally, the study will offer opportunities to investigate the complex interactions among home, school and student variables as they evolve through the elementary school years.

Variables

The variables chosen for investigation in this study were selected from a wide range of potential variables describing the child, the home and the school. The variables that describe the child are the dependent variables. Those describing the home and school are the independent variables. Some characteristics of the child, the home and the school function as control or classification variables.

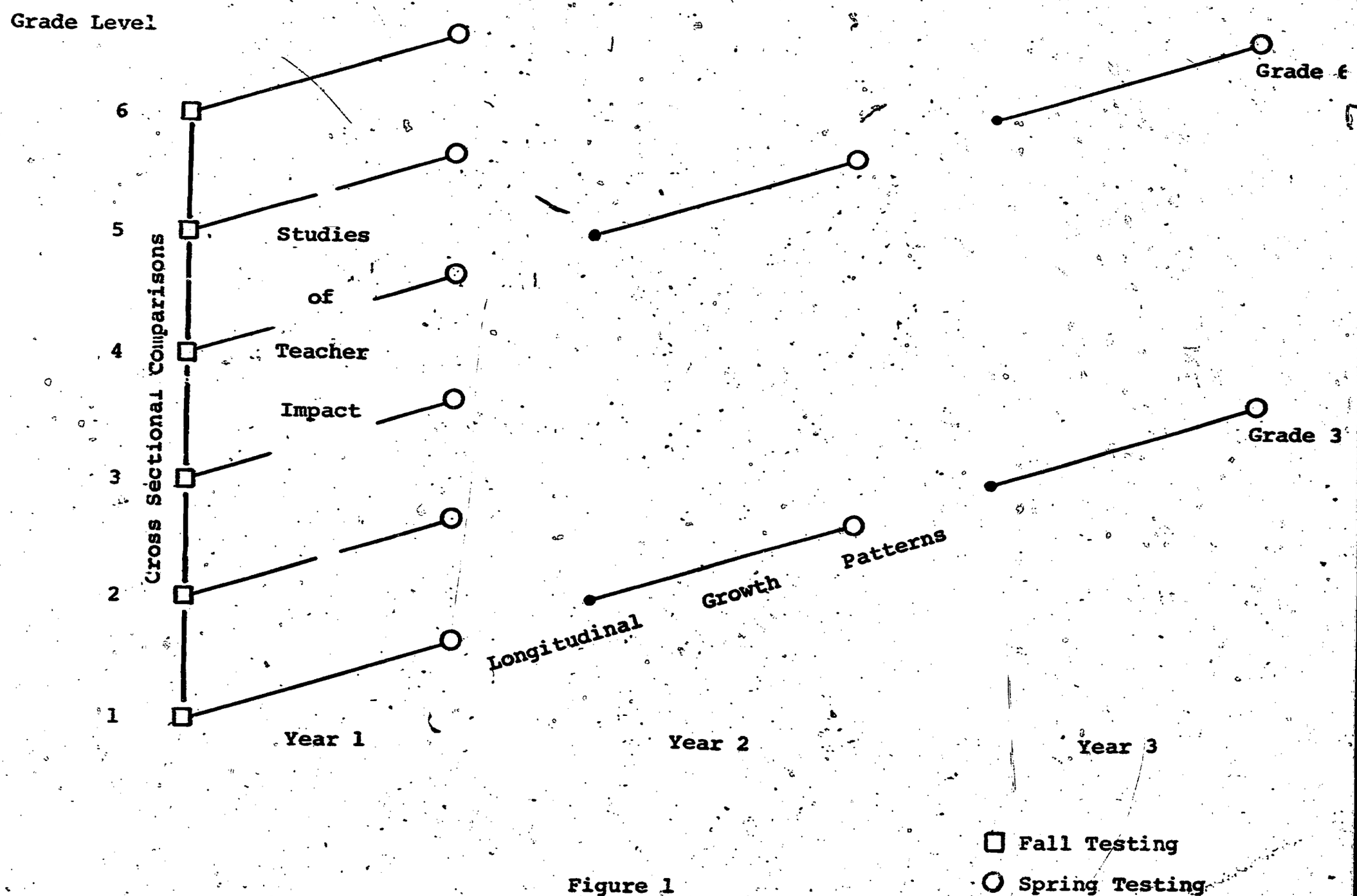

Figure 1

Design of Study

Dependent variables. The following list of dependent variables represents a stringent sampling in the areas of achievement, cognitive processes and affective development.

Reading achievement
Arithmetic achievement
Problem solving
Concept formation
Attitude toward school
Self-concept
Personal-social development

In the achievement area, reading is the key variable. Research literature documents its pervasive relationship with academic achievement in all curriculum areas. Arithmetic achievement represents the quantitative dimension.

In the cognitive area, problem solving and concept formation are the dependent variables. These two variables reflect the adaptive, coping strategies of the developing child.

In the area of affective development, attitude toward school, self-concept and personal-social development were selected as representative variables.

Independent variables. The major independent variables in a study of elementary school effects must reflect the distinctive features of school and home which contribute to the growth of the child. The following list of independent variables represents a selection from the school variables that the literature suggests may be important.

School organizational climate
Classroom physical environment
Classroom materials and equipment
Size of class
Reading strategies
Arithmetic strategies
Verbal facility of teacher
Teaching behavior
- Warmth
- Enthusiasm
- Clarity
- Variety
- Individualization
- Feedback
- Cognitive demand
- Freedom
- On-task Activity

The school organizational climate sets the context within which teaching takes place. Teaching is further constrained by the physical environment of the classroom, the adequacy of materials and equipment and the number of pupils in the class. Given the context, the teacher is certainly the

most important element in the classroom. The independent variables stress the teacher's instructional strategies, his verbal facility and a selected set of specific teaching behaviors.

The literature also suggests a multitude of potential variables related to the home. The following list of independent variables has been chosen to reflect important parental attitudes.

Parental aspiration for child
Learning environment
Concern for education
Maturity demand
Quality of TV
Parental restriction of TV
Activities of parents
Parental attitude toward education
Acceptance of child
Permissiveness
Restrictiveness
Parental attitude toward child nonconformity
Parent's authoritarian attitudes

Both the child's achievement and attitude toward school are likely to be influenced by such variables as the richness of the learning environment in the home, parental aspirations for the child, and concern for education. The child's self-concept and personal-social development may reflect maturity demand in the home, acceptance of the child, and the permissiveness or restrictiveness of the parents.

Control or classification variables. Information is collected which will permit the control of some variables and the classification of children, homes, teachers or schools on the basis of important characteristics. The major control or classification variables are listed below.

Demographic information about child
General ability
Pre-school education
Demographic information about home and family
Demographic information about teacher
Teacher satisfaction

This presentation of the important variables in the study omits many sub-scores and individual items. Also omitted are descriptions of supplementary data collected on the limited sample of children who will be followed for three years. A complete list of all variables and corresponding instruments for data collection is presented in the appendix.

Relationships among variables. The variables are introduced as clusters of variables describing the child, the home and the school in order to make explicit the structure of the study. The study is designed to permit analysis of the network of relationships among the variables.

If the child's attitude toward school is an important dependent variable, then both the parents' attitude toward education and the teacher's warmth and enthusiasm become relevant independent variables. Figure 2 illustrates the interactive nature of the home and school variables impinging on the child.

Multimethod Assessment of Variables

In two important areas, the personal-social development of the child and the descriptions of teaching behavior, multimethod approaches to measuring the variables have been built into the instrumentation of the study. The primary measure of personal-social development is a sociometric instrument on which pupils rate their peers on a variety of behaviors. In addition, first and fourth grade teachers provide similar information about the small group of children selected to be followed for three years. If positive correlations are obtained from these interlocking measures, such correlations will offer support for the validity of the instruments.

Multimethod approaches also have been employed in the description of teaching behavior. Pupils describe the teacher's instructional behavior. Teachers complete a form describing their own behavior and trained observers rate teachers on the same dimensions. Again, positive correlations among these three measures would offer support for the validity of the instruments used to assess teaching behavior.

Instruments

Fifteen instruments were selected or developed to measure the variables in the study. These instruments are listed and described below.

1. Class Roster - a checklist form that obtains from the teacher a complete class list and preliminary information about each child.

2. Raven's Coloured Progressive Matrices - a non-verbal test measuring general ability of children in grades 1 through 6.

3. Clymer-Barrett Prereading Battery - a readiness test based on recognition of letters and sounds. This test will be used at the beginning of grade 1.

4. Stanford Early School Achievement Test (Mathematics) - a test to measure number concepts. This test will be used at the beginning of grade 1.

5. Stanford Achievement Tests, 1973 edition (Reading and Mathematics) - tests designed to assess reading comprehension and mathematics computation and concepts.

6. Purdue Elementary Problem-Solving Inventory (Picture-Book Form) - a problem-solving test employing cartoons depicting children in problem situations for which solutions are selected.

7. Purdue Concept Formation Test - Conservation - a test designed to measure the ability to conserve quantity, length, mass, area and volume.

8. Attitude Toward School - a questionnaire designed to assess attitude toward school in general, attitude toward schoolwork and attitude toward teacher.

9. Piers-Harris Children's Self-Concept Scale - a self report indicating how a child feels about himself used for grades 4 to 6. A shortened form adapted from Piers-Harris is used for grades 1 to 3.

10. Peer Ratings of Personal-Social Development - sociometric scales obtaining ratings of each child by three other children on 12 characteristics.

11. Pupil Information Booklet - a booklet completed by the teacher for each child in the cohorts. The booklet provides demographic information and ratings of the child's personal-social development.

12. Parent Questionnaire and Parent Interview Schedule - a questionnaire obtaining demographic information from the parents and information related to educational aspirations and parent-child relations. The interview schedule is a modification of the questionnaire.

13. Pupil Description of Teaching - a pupil report which describes the teacher's instructional practices.

14. Teacher Questionnaire - a self report which obtains demographic information, and measures of organizational climate, instructional practices and verbal facility.

15. Teacher Observation Scales - observational procedures for recording classroom descriptions, instructional strategies and teaching behaviors. Teaching behaviors are observed on dimensions which parallel those on the Pupil Description of Teaching and the Teacher Questionnaire.

Each instrument is described more fully in a later section of this report.

Sampling Plan

Several principles have guided the sampling plan. The population defined for sampling should be as large as possible. The sampling plan should enable any school within population regions and strata to have an equal chance of being drawn. For economy and close field coordination and supervision of the data collection, the sample should have high geographic clustering. To expedite and standardize procedures and conditions at each site, the sampling should be simple and make use of sampling frames that can be constructed locally on the basis of data that can be expected to be available at each site. Lastly, the sampling plan should be flexible enough to scale up or down according to the total funds allocated to the study and also to meet field contingencies such as uncooperative school

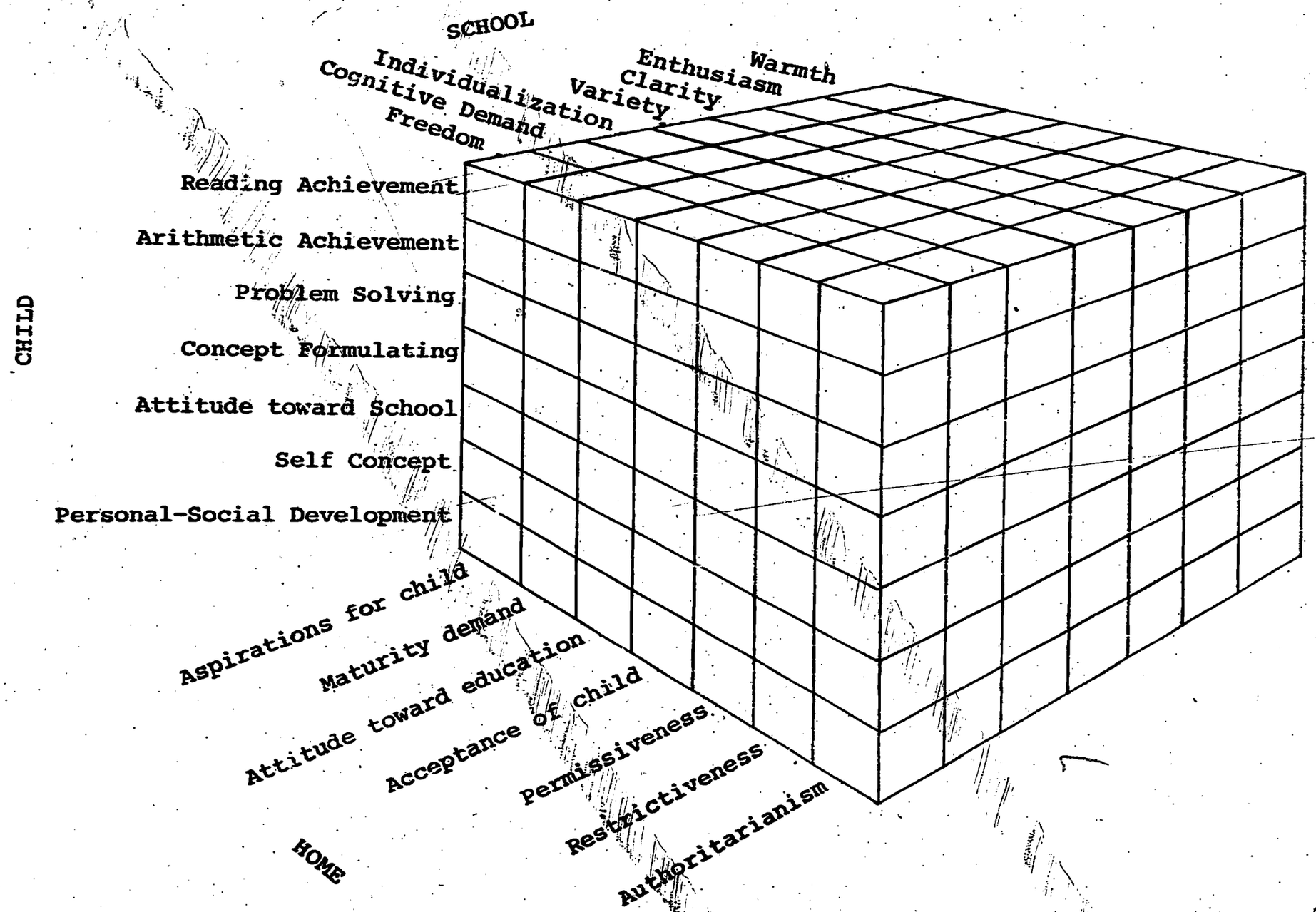

Figure 2

Interactive Nature of Variables

districts.

The sampling frame will consist of the 243 Standard Metropolitan Statistical Areas which contained in 1970 about 139 million persons or about 70 percent of the total population in the United States, of which 120 million were white and 17 million were black. Since the SMSA's only contain about 10 percent of the U. S. land area, this population affords a high degree of geographic clustering. The Bureau of the Census defines a SMSA as an integrated social and economic unit with a large population nucleus. Each SMSA contains a central city of 50,000 or more inhabitants, or two cities with contiguous boundaries forming a socio-economic unit of 50,000, the smaller of which must have a population of at least 15,000. The 243 SMSA's will be sorted into four geographic regions, the Northeast, Midwest, Far West, and South, and two SMSA's will be randomly selected from each region, yielding 8 basic sites.

A Site Manager and two Survey Team Leaders will be recruited from local universities or federally-sponsored research agencies at each site. The main responsibilities of the Site Manager will be to gather data to carry out the sampling within the site, obtain the cooperation of the local educational authorities, and direct the data collection in the schools. To gather the data within a period of four weeks during the fall and spring testing periods, each of the two Survey Team Leaders will assume responsibility for leading teams in surveying six schools. The schools will be surveyed in the same sequence to insure that the time between testings is roughly the same for all schools. A strong effort will be made to recruit minority group members to serve on the staff at each site.

It can be estimated that about three classes will exist at each grade level in the schools selected for the study. Estimating 30 pupils in each class, the sampling procedure will yield about 540 students per school, 6,480 at each site and 51,840 in the total national sample. The following tabulation summarizes the estimates based on testing all classes in the survey schools:

Sampling Level		Cumulative Number of Pupils
1	Class	30
3	Classes at each grade level	90
6	Grade levels at each school	540
12	Schools at each site	6,480
8	Sites	51,840

Rounding down, the above figures define the initial year sample as approximately 51,000 students and 1,700 teachers.

Eight children will be sampled from all first and fourth grade classes to form the cohorts for further longitudinal analysis. The following tabulation presents estimates of the sample size for the second and third years of the study.

Sampling Level		Cumulative Number of Pupils
1	Subsample from each class	8
3	Classes at each grade level	24
2	Grade levels at each school	48
12	Schools at each site	576
8	Sites	4,608

These figures indicate that 4,600 children will be in the study after the initial year, approximately 2,300 children in each cohort.

Educators and federal program managers are concerned with poor, minority children in the central cities, and these major target groups should be oversampled. Thus, for each central city, a list of public schools will be obtained with an indication of each school's eligibility for Title I funds under ESEA. The central staff of the Chicago Public Schools has surveyed the 15 largest public school systems in the United States and found that all have some objective basis for determining eligibility such as census data, percent of children in families receiving Aid to Families of Dependent Children support, or local surveys. The schools within the district will be rank-ordered according to the objective criterion available, and eight schools will be randomly selected from the half of the list containing schools in disadvantaged areas; two schools will be chosen randomly from the rest of the list. In addition, one suburb, village, or town within the SMSA outside the central city will be randomly chosen, and two schools within the public system will be chosen randomly for inclusion in the survey.

The proposed sampling plan can be modified. If economies become necessary, limiting the study to one site per region with a total of four sites would cut the costs considerably, though not in half since the costs of printing tests and processing the data are lower on a per unit basis with larger samples. Also, practical considerations may require modification of the sampling plan. Coleman, when collecting data for the Equality of Educational Opportunity survey, was unable to obtain access to large city school systems in several cases. Therefore, it may become necessary to select the next largest municipality in one or two SMSA's.

Testing Sequence

The data collecting process will proceed through a series of sequential steps:

1. Each teacher will complete a class roster form. This form provides the master record of children in the study. The form also will permit the selection by the project staff of eight children from each class for the cohort sample.

2. A battery of achievement, cognitive, self-concept, attitude toward school and socialization tests will be administered during a four week fall testing period.

3. During the winter months, teachers will complete a questionnaire about their own teaching practices and be observed three times by trained observers. Children will take home a questionnaire to be filled out by a parent. Parents who do not return the questionnaire will be interviewed. Teachers also will complete an information booklet for each child selected for the cohorts.

4. During a four week period in the spring, the battery of tests will be readministered, with the exception of the test of general ability. Children also will complete a form describing the teacher's instructional practices.

5. During subsequent years, the fall and spring battery of tests will be administered to all children in the cohorts. In the spring, teachers also will complete an information booklet for each child in the cohorts.

6. No new parental information will be collected during subsequent years and no further assessments of teaching behavior will be obtained.

7. During the initial year, testing will include all children enrolled in a project school during the fall and spring testing periods.

8. All children in the cohort groups migrating out of the original schools, but remaining within the boundaries of a site, will be retained in the study over the three year period.

9. A 20 percent sample of cohorts migrating out of the original site will be obtained and the data analyzed to provide information about biasing effects of selective migration of students.

Testing Schedule

The number of tests required of the children in this study is quite large. In addition, a number of variables reflect attitudes and feelings that are likely to start changing in response to the new school environment from the very first days in class. It seems desirable, therefore, to initiate testing as soon as the children have made an initial adjustment to school. The schedule provides for three major data gathering periods, fall, winter and spring. The fall and spring testing periods provide measures of the major dependent variables. The winter period provides data on the home and school. The fall testing period should start the last

week of September, the winter period in mid-January, and the spring period in mid-March.

The fall and spring testing periods are four weeks long. The schedule for first grade testing, presented below, illustrates the collection of attitude and self-concept data in two separate sessions during the first week, and the collection of achievement measures in three sessions the next week. Problem-solving and concept formation tests will be administered in two sessions in the third week. During the fourth week, the Raven's Coloured Progressive Matrices will be administered in one session and peer ratings will be collected in another session. No single testing session exceeds 45 minutes. Trials with the instruments indicate that the time estimates are generous. Testing at other grade levels will follow a similar schedule.

First Grade Schedule

Fall

First Week	
Attitude Toward School	20 minutes
Self-Concept	40 minutes
Second Week	
Clymer-Barrett Prereading Battery	
Part A	18 minutes
Part B	15 minutes
Stanford Early School Achievement Test (Math)	20 minutes
Third Week	
Purdue Elementary Problem-solving Inventory	40 minutes
Purdue Concept Formation Test - Conservation	40 minutes
Fourth Week	
Raven's Coloured Progressive Matrices	30 minutes
Peer Ratings	40 minutes

Spring

First Week	
Attitude Toward School	20 minutes
Self-Concept	40 minutes
Second Week	
Stanford Achievement Tests	
Reading	
Vocabulary	20 minutes
Reading Comprehension, Part A	20 minutes
Reading Comprehension, Part B	20 minutes

Spring (continued)

Second Week (continued)
Stanford Achievement Tests (continued)
Arithmetic

Concepts	25 minutes
Computation	30 minutes

Third Week

Purdue Elementary Problem-solving Inventory	40 minutes
Purdue Concept Formation Test - Conservation	40 minutes

Fourth Week

Pupil Description of Teaching	30 minutes
Peer Ratings	40 minutes

Teachers and Parents. Data will be collected from teachers and parents primarily during the winter. The time estimates for instruments are listed below.

Class Roster	60 minutes
Pupil Information Booklet (30 minutes per child, eight children)	240 minutes
Teacher Questionnaire	60 minutes
Parent Questionnaire	60 minutes
Parent Interview	60-90 minutes

Migrating Children

One of the major concerns in planning the longitudinal study has been the problem of migrating children. Although nationally perhaps 5 to 10 percent of the children move out of a school's attendance district during a school year, mobility rates in inner-city schools runs as high as 50 percent. Migrating children do not, however, constitute a problem during the initial year of the study. During this year, primary data analysis will center around classroom means. Even in areas of high mobility, classroom replacements share many demographic characteristics with children who leave. Suburban children migrate through suburban schools and inner-city children migrate through inner-city schools. For this reason, mean scores of class groups obtained in the fall and spring should not be greatly affected by migration alone.

The migration of cohorts studied over a three year span, however, could be troublesome. Concern has been expressed that cohorts in a relatively compact set of classes during the initial year will be found dispersed over a great many classes during the following years.

The problem of proliferating classrooms may be considerably smaller than anticipated. Typically the number of first grade classes in an elementary school defines the maximum number of classes in each of the upper grades. Thus, if a school with three first grade classes participates in the study then, discounting migration, all children making normal progress will be found in three second grade classes of the same school during the second year of the study.

The problem of cohorts who migrate from the original school is somewhat larger. Two procedures, however, should reduce the problems of locating children who change schools. First, the school record folders of all children selected as cohorts for the study will be flagged with a gummed label displaying a colored insignia identifying the folder as belonging to a child participating in the National Longitudinal Study of Elementary School Effects. In the folder will be a self addressed postcard, identified with the same colored insignia, requesting school personnel to mail the card giving new school address in the event of transfer of records.

The second procedure designed to facilitate tracing students who move is the collection of special information from parents. On the parent questionnaire and interview schedule, there is a request for the name and address of a close friend or relative who will have a forwarding address in case the respondent moves. This information together with that supplied by the school personnel should enable accurate tracing of a high percentage of the students who change schools.

Once the children are located, a second problem is that of imposing a lengthy testing schedule on a single child enrolled in a school which is not participating in the study. This latter problem can be approached through test sampling procedures. Migrating children will be administered a subset of three tests. For example, some first grade children in the cohort group who changed schools between fall and spring testing might be administered Reading Achievement, Self-concept, and problem solving. Other migrating first grade children might receive the Math Achievement, Attitude Toward School, and Concept Formation. Peer ratings will be obtained by drawing a subsample of the child's new classmates. All testing of migrating children would be accomplished by special examiners from the project staff. No assessments of teaching behavior will be obtained for the new class.

All cohorts changing schools within a site will be traced and tested by the resident project staff. The cost of tracing and testing individual cohorts migrating out of the site area will be very high. A sample of 20 percent of these children will be traced and tested using test sampling procedures. The data obtained from the small subsample of migrating cohorts will be used to identify and describe the nature of any biases introduced by selective migration.

Data Analysis

Plans for analyzing the data must take account of the unique relationships among variables and among patterns of variables mentioned above. Account must also be taken of the kinds of scales used and of the large number of variables to be handled.

Thus, the statistical analysis of the data will proceed in stages, each stage designed to simplify the analysis in the next stage as much as possible, while still preserving a maximum of information about relationships among the variables.

The first stage of data analysis is designed to combine some of the discrete variables into more functional indices; for example, employment of parents, family income, type of dwelling, and number of rooms should combine to form a single index of socioeconomic status.

During stage two of the analysis, simple descriptive statistics (means, standard deviations) and correlations will be generated for major categories of children.

In stage three, factor analysis of dependent and independent variables will be performed in an effort to reduce variables within each set and to combine data collected with several instruments about a single dimension of behavior. The Plowden report (Peaker, 1971) provides an excellent example of data reduction using these procedures. In addition the stability of factor structures across major classification groups will also be examined.

In stage four, multivariate regression techniques will be applied to determine the predictive relationships among the independent and dependent variables.

Each stage of the data analysis plan is further detailed below.

Stage I. Inventory of Categorical Variables Within the Control Group

Although it would be of great value to be able to perform separate analyses of the relationships among the dependent and independent values for each cell of a crossclassification of individuals by sex, grade, race, SES, etc., a complete cross-classification of this type would involve too many cells (and thus too few observations in each cell). It will be necessary to classify children by grade, and certainly possible to cross-classify by sex and race. However, before attempting to use the other categorical variables (SES, Pre-School Experience, Dwelling Type, etc.) for a more refined classification, preliminary data analysis must be done to see how many children can be observed in each cell of various kinds of cross-classification. Hence, the first step in the analysis of the data will be to construct contingency tables among all of the categorical control variables.

Analysis of these tables, perhaps through Lazarsfeld's latent structural analysis (1966), will yield a picture of the relationships among the categorical variables, and will allow a subset of these variables to be chosen for purposes of aggregating the data for separate statistical analyses.

Of the remaining categorical control variables, those that are highly related to the categorical variables used for aggregation of the data will not be used further (since their influence is already reflected by the variables used for aggregation). The other remaining categorical variables will be combined, if possible, into one or more ordinal scales (indices) reflecting socioeconomic status, special talents or handicaps, and home educational stimulus (e.g., pre-school training, home language environment, etc.) of each child. These scales, together with the numerical (ordinal and interval scale) control variables, will be used as conditioning variables (moderator variables) in the remaining steps of the analysis.

Stage II. Data Analysis of Dependent and Independent Variables

All of the dependent and independent variables in the study can be expressed at least on an ordinal scale. Thus, all of these variables can be treated as continuous variables and subjected to standard univariate and multivariate analyses. All of the analyses described below will be done separately for each cell of the cross-classification obtained in Stage I.

(a) Means and variances will be computed for all independent, dependent, and numerical control variables.

(b) Zero-order correlations will be computed among all of the variables named in (a).

Using the output of (b) and either canonical correlation analysis and/or step-wise partial correlation analysis (with the orders in which the variables are entered being determined by a priori consideration of the importance of the variables), attempts will be made to reduce the number of numerical control variables to a more manageable size. Once these numerical control variables are selected, these variables will be used as conditioning variables, and:

(c) Conditional means will be computed for all independent and dependent variables.

(d) Residual means and variances will be computed for all variables.

(e) Partial correlations will be computed among all of the independent and dependent variables.

For the purpose of further analysis, the quantities obtained in (d) and (e) can now be treated as ordinary means, variances, and

zero-order correlations, based on a reduced number of observations (Morrison, 1967; Rao, 1965; Anderson, 1958).

Stage III. Reduction of the Number of Independent and Dependent Variables

As mentioned above, an unique aspect of this study is the use of multiple measurements of common behavioral dimensions. Although this feature of the study should lead to greater accuracy of conclusions and greater flexibility, it does mean that many of the variables, both within the set of independent variables and within the set of dependent variables, are highly correlated (indeed, have a single factor structure). Hence, unless these single factor configurations of variables are reduced and summarized by a single variable, a serious problem of multicollinearity may result, thus complicating interpretations of the relationships among the dependent and independent variables. In consequence, at this stage of the analysis, Procustes factor analysis techniques will be used to obtain a smaller class of dependent and independent variables which will (1) retain all or most of the information about the behavioral dimensions measured by the larger class of variables, and (2) have a direct and namable relationship to the behavioral dimensions measured by the above mentioned clusters of highly dependent (single-factor) variables. Principal components ~~will be~~ obtained separately for the dependent and independent variables. Each of these components will then be rotated in turn through a set of target vectors reflecting the behavioral dimensions deemed common to the variable clusters present in these variable sets. From these factor analyses (one for the dependent and one for the independent variables), all factors common to the variable clusters will be retained, as well as all factors exhibiting significantly large variances. Where several variables load almost entirely on a single factor, only that factor will be retained for the later analysis. However, variables loading lightly on several factors (and/or with a unique and large component of variance) will be retained for the analysis, in place of the factors obtained. In short, the Factor Analysis will be used not to replace all of the variables, but only to identify multicollinearites in the data and to eliminate these by replacing highly correlated variables by the single factor (or factors) accounting for all of their variation. (If time and available computer facilities permit, however, separate regression analyses relating the dependent factors to the independent factors may be attempted.)

Besides permitting a reduction in the number of variables considered, the factor analysis performed at this stage will be retained for descriptive purposes, since it will indicate the behavioral domains sampled by the study, and give some indication both of the reliability of these domains (in the presence of the control variables), and of the validity of the study (i.e., that the behavioral domains which the study has been designed to sample have indeed been sampled).

It should be remarked that these factor analyses will be performed separately for each cell of the cross-classification by control variables obtained in Stage I. At the present time, it is planned that reduction of variables will be done only if the same reduction can be achieved simultaneously in all cells. The requirement, however, may have to be relaxed somewhat if the factor analyses in various cells are not roughly comparable. If it turns out, however, that the factor analyses are not comparable across cells, this result will, of course, be a highly significant finding of the study.

Stage IV. Multivariate Regression

Having reduced the complexity of the analysis as much as possible, in each cell a separate multivariate regression analysis will be performed to determine predictive relationships among the independent and dependent variables, and to test the tentative hypotheses about such relationships stated earlier in this report. It should be remarked that for purposes of this analysis (and for the analysis in previous stages), the fall measurement of any achievement variable which was also measured in the spring will be used as an independent (predictor) variable for the spring measurement. This technique for measuring change (growth) when multiple repeated measurements of the same variable are obtained has been recommended by Bock (1963) and others.

Also, a multivariate analysis of covariance for the dependent variables across cells, with the independent variables as covariates (Gleser & Olkin, 1969, 1972; Rao, 1958, 1959, Pottoff & Roy, 1964) will be used to determine the influence of the categorical control variables on the relationships between the independent and dependent variables. If no significant differences across grade levels are found, the separate regression analyses for these grade levels can be pooled (with grade level as an independent variable) to produce an overall growth curve for the dependent variables over time (grade level). This growth curve can be later compared with growth curves obtained from the longitudinal study.

In addition to overall multivariate growth curve analyses, marginal (univariate) growth curve analyses on each dependent variable will be performed so as to obtain a more detailed picture of what independent variables influence growth in each dependent variable. These more detailed studies will be used to supplement the overall picture provided by the multivariate analysis.

Another, more detailed study, that can be attempted as time and budget permit is a canonical correlation analysis between the dependent and independent variables. This analysis will study predictability of configurations of dependent variables (dependent canonical variates) by prior (antecedant) patterns of independent variables (independent canonical variates). If the canonical

variates so obtained coincide roughly with (or have high correlations with) the factors obtained by the analysis of Stage III, this will provide a significant interpretation of the dependencies revealed by the multivariate regression analysis.

Taken together, these analyses can provide a more complete and detailed picture of the effects of home and school environments on the cognitive, affective, and social development of children in the primary schools than have been available from previous studies.

Development and Selection of Instruments

Instruments for the study need to cover a broad group of settings by administrators without extensive training. A review of the psychometric literature in the relevant areas indicated that a surprising amount of instrument development has accompanied other studies, particularly those related to the preschool phase of development. In the vast majority of cases, however, the instruments are focused on variables unique to a particular study or only applicable to a limited age group. As Beller (1973) points out, the temptation to use available instruments can result in low validity and "...what is worse, one often ends up with a lot of answers in search of questions (p. 20)." The literature review did, however, yield valuable approaches to instrument development, and in some cases provided the major item pools for the instruments presented.

Each of the newly developed instruments underwent several trials and revisions. In the final trials, all instruments were administered to approximately 200 children in grade 1 and 200 children in grade 4. These children were enrolled in seven classes at each grade level in elementary schools in Indianapolis serving primarily black, disadvantaged communities. Five elementary schools participated in the study.

All tests were administered by project staff recruited for this purpose. Achievement test scores were taken from the school records and reflect the city-wide testing program using the Metropolitan Achievement Tests. The Pupil Information Booklet, designed for completion by the teacher for the cohorts only, was completed for three children in each classroom, or a total of 21 students at each grade level.

The Indianapolis trials provided final item analysis data, reliability estimates and information about administrative problems. The trials also provided a large volume of data which was analyzed to examine the interrelations among the various instruments. Subsequently the teacher observation procedures, portions of the Teacher Questionnaire, and the Pupil Description of Teaching were revised to such an extent that the relationships established in Indianapolis will no longer be applicable. In these cases the Indianapolis data may be suggestive of the relationships obtainable with the general class instruments

In the remainder of this report, a separate section is devoted to each instrument and the results obtained from the preliminary try-out of instruments in Indianapolis. In a few cases, the instruments have been revised, so that sub-scales for which data are reported may not always be identical with sub-scales in the final instruments.

Class Roster

The Class Roster is designed to provide the master record of all pupils participating in the study. Provision is made for an identification number which locates each child by school, grade and teacher. Sex, race and age are included. An estimate of socioeconomic status is requested, since income information for some families may be omitted from the Parent Questionnaire. The teacher is asked to indicate individuals who are handicapped so that such children can be identified for special substudies. The teacher also is asked to identify those children who, for any reason, receive their reading or arithmetic instruction from someone else. This information will permit identification of children who are not taught reading and arithmetic by classroom teachers who are not being observed and who should not enter into comparisons of teacher observation data and achievement data.

Table I presents the Class Roster information for the Indianapolis sample. No information regarding reading program and arithmetic program was obtained on the original form of the Class Roster.

The original form of the Class Roster asked teachers to identify students who were academically, musically or artistically talented. Of the 398 pupils in the Indianapolis sample, 23 were identified by teachers as academically talented, six as musically talented and nine as artistically talented. Among the 11 first grade students who were identified as academically talented, and who also took the Raven's Coloured Progressive Matrices, five children, or almost half, were below the average score earned by the first grade group on the Raven's. At the fourth grade level, of the nine students for whom both teacher's ratings and Raven's scores were available, two pupils had Raven's scores that were average or below. These data raised questions about the accuracy of teachers' identification of talented youngsters and requests for such information therefore were eliminated from the final form of the Class Roster.

Table 1

Frequency Distribution and Percentages

Class Roster

	n	%
Sex		
Female	200	50.3
Male	198	49.7
Race		
Black	230	57.8
White	167	42.0
Other	1	.3
SES		
Lower	254	63.8
Middle	130	32.7
Upper	12	3.0
Not Rated	2	.5
Handicaps		
Mental	21	5.3
Physical	6	1.5
Speech	11	2.8
Hearing	5	1.3
Visual	13	3.3
Total	398	100.0

Raven's Coloured Progressive Matrices

The Raven's Coloured Progressive Matrices Test (CPM) has been selected as a measure of general ability. The test is a widely used measure of general aptitude for school work and does not penalize children from low socioeconomic homes. It is regarded as being relatively culture fair with no reference to common objects and no reading required. Experience has little effect on the score obtained. The test is simple and quick to administer. It is not a timed test although students can be paced through the test. Because of the format of the test with all items of a similar nature, there is likely to be little if any error resulting from variations in test administration procedures.

The CPM is normally administered individually using the board form for young children 5-7 and the booklet form for older children. Reports of group administrations as well as preliminary testing indicated that results did not differ if the test was group administered using the booklet form. Thus a decision was made to study group administration during the Indianapolis testing. The results were excellent. It seems feasible to plan for group administration at all levels except first grade. First grade pupils can be tested in small groups if initial orientation to test taking is conducted.

In exploratory conversation with Mr. John Ricks, Jr. of the Psychological Corporation, the United States distributor of the CPM, the possibility of using a black and white form of the test was considered. We feel that little if anything will be lost by adapting the color form to the black and white format. Of course if the cost of the CPM as now available can be borne then we recommend the CPM be used in color. But in large scale testing the cost might be considerably reduced by using a black and white form. The arrangement for this would have to be made with Mr. Raven (son of J. C. Raven) in England to secure permission to print or buy a black and white form.

From the tryouts in Indianapolis, the CPM seemed well suited for the purpose selected. This statement is based on the following considerations.

1. The means for both grade one and grade four pupils were quite close to the means of the norm group reported in the test manual (Raven, 1963). For grade one, the Indianapolis mean was 16.2 compared to a mean of 16 for the norm group. For grade four the means were 25.1 and 24 respectively.

2. The standard deviations were less than reported by Raven's for the same group First grade 5.3 vs. 5.8; Fourth grade 5.8 vs. 7.1.

3. The KR 20 internal consistency values were .83 and .86 for the first and fourth grades respectively. This is well within the range of values reported in the literature.

4. It was anticipated that the group administration of the booklet form of the test would yield valid results with fourth grade pupils but there was initial concern for group administration at the first grade level. This concern was unfounded as revealed by the comparisons of means, standard deviations, reliabilities, and observation of the test administration. Furthermore, the correlations of CPM scores with reading and mathematics achievement were about the same at grade one as grade four.

5. An analysis of subscores as compared with norm values revealed close correspondence for the 3 subscores of the test. At first grade the subscores were 7.3, 5.1, and 3.8 compared to the values of 8, 4, and 4 for the norm group. At the fourth grade level the subscores were 9.5, 8.5, and 7.1, compared to 10, 9, and 6.

6. The study of patterns of incorrect choices revealed that the children were responding meaningfully to the items. The guide to the use of the CPM (Raven, 1965) provides means for classification and analysis of incorrect choices, e.g., "The figure is irrelevant," "It is incomplete, but correct as far as it goes." Very few pupils responded to the test by choosing the irrelevant figure. Error analysis revealed that pupils missing items were understanding the item even though they could not make a correct choice.

7. The correlations of CPM scores with reading and mathematics achievement were in the range expected, .25 to .45.

Reading and Mathematics Achievement

Bloom (1964) stated that all achievement areas are so interrelated and verbally oriented that measures of reading comprehension collected at the third grade level tend to be indicative of achievement in all the content areas at the junior and senior high school level. More recent studies (Newman, 1972) which were follow-ups of the USOE first-grade reading studies (Bond & Dykstra, 1967) support Bloom's statement.

What has been of concern, however, was the means by which reading achievement should be determined. In a review of the literature, the following sources of information were found to be particularly helpful: 1) Guide to Tests and Measuring Instruments in Reading (Farr & Summer, 1968), 2) Reading: What Can Be Measured? (Farr, 1969), 3) Measurement and Evaluation of Reading (Farr, 1971), 4) Measurement of Reading Achievement (Farr, 1971), and 5) The Literature of Research in Reading with Emphasis on Models (Davis, 1971).

A variety of published group reading achievement tests were identified and examined. This included each of the following.

Burnett Reading Series: Survey Test
California Achievement Tests: Reading
Gates-MacGinitie Reading Tests
Metropolitan Achievement Tests: Reading
New Developmental Reading Tests
SRA Achievement Series: Reading
Stanford Achievement Test: Reading Tests

After a critical review of the reading achievement tests in terms of their validity, reliability, possible use by the classroom teacher (usefulness of teacher's manual, format, etc.), and the time required to administer the test, it was concluded that the 1973 Stanford Achievement Tests: Reading should be used for the longitudional study. Vocabulary and Reading Comprehension subtests will be used, but Word Study Skills subtests will be omitted. Specific information about the tests to be used is presented in Table 2 and Table 3.

Table 2

Stanford Achievement Tests: Reading

Level	Grade	Form	Skill	Items	Time (Minutes)
Primary Battery					
I	1.5 - 2.4	A,B,C,	Vocabulary	37	20
			Reading Comp. Part A	45	20
			Reading Comp. Part B	42	25
II	2.5 - 3.4	A,B,C,	Vocabulary	37	20
			Reading Comp. A	45	20
			Reading Comp. B	48	20
III	3.4 - 4.4	A,B,C	Vocabulary	37	20
			Reading Comp.	70	35
Intermediate Battery					
I	4.5 - 5.4	A,B,C,	Vocabulary	50	25
			Reading Comp.	72	35
II	5.5 - 6.9	A,B,C,	Vocabulary	50	25
			Reading Comp.	71	35

Table 3

Reliability Measures

Stanford Achievement Tests: Reading

Level	Grade	Forms	Skills	SH	KR-20
Primary					
I	1.5 - 2.4	A,B,C,	Vocabulary	.87	.86
			Comp. Part A	.95	.94
			Comp. Part B	.95	.95
II	2.5 - 3.4	A,B,C,	Vocabulary	.85	.84
			Comp. Part A	.95	.94
			Comp. Part B	.96	.95
III	3.4 - 4.5	A,B,C,	Vocabulary	.89	.88
			Reading Comp.	.96	.96
Intermediate Battery					
I	4.5 - 5.4	A,B,C,	Vocabulary	.90	.90
			Reading Comp.	.95	.94
II	5.5 - 6.9	A,B,C,	Vocabulary	.90	.90
			Reading Comp.	.95	.94

SH = Split Half
KR-20 = Kuder-Richardson Formula 20

Since there are other widely used and highly respected reading achievement tests, some comment as to their possible use seems warranted here. The California Achievement Tests: Reading, the Gates-MacGinitie Reading Tests, and the Metropolitan Achievement Tests: Reading are all acceptable instruments for measuring reading achievement. However, the Stanford (1973) has been chosen because (1) it appears to be more culture free, (2) it is more reliable, and (3) it will not be used before September 1973 in school testing programs.

While a test of reading comprehension may be administered at the end of grade one, such a test would not be appropriate at the beginning of grade one. The knowledge of letter names at the beginning of grade one has been shown (Durrell, 1958; Barrett, 1965; Bond & Dykstra, 1967; and Dykstra, 1967) to be the best predictor of success in reading at the end of grade one; for this reason the Recognition of Letters subtest of the Clymer-Barrett Prereading Battery should be administered as the "reading" measure at the beginning of grade one. The Recognition of Letters subtest (35 items, 18 minutes to administer) and the Descrimination of Beginning Sounds subtest (20 items, 15 minutes to administer) constitute the short form of the Clymer-Barrett Prereading Battery.

Some comments as to why the reading-related subtests of the Stanford Early School Achievement Test, SESAT, (Madden & Gardner, 1971) are not being recommended for testing at the beginning of grade I appears warranted. The most appropriate reading-related subtest of the SESAT for the beginning of grade one is the subtest entitled Letters and Sounds (Part 3). However, this subtest is actually two different subtests, each of which measures a different construct. Items 1-13 assess the ability to identify a written letter which the examiner has identified orally. Items 14-41 assess the ability to match beginning sounds. Although the KR-20 reliability coefficients for grade one testing range from .89 to .92 for the complete subtest (all 41 items), it is doubtful if such reliability would be maintained if assessment were limited to the portion dealing with letter knowledge only, the first 13 items. Therefore, the Recognition of Letters subtest for the Clymer-Barrett Prereading Battery with 35 items is considered to be a better measure of the student's potential for success in reading.

The Stanford Achievement Test 1973 (SAT) will be used to collect mathematics achievement data at grades 1-6. The SAT is well suited for the purposes of this study having high reliability and excellent content validity. The 1973 edition will be new and not used by students previously. The existence of a 1973 edition is a good recommendation in itself.

The problem of obtaining base line data for mathematics during the fall testing at grade one can be overcome by using the Stanford Early School Achievement Test II, 1971 (SESAT). The SESAT II is designed to measure children's cognitive abilities upon entrance to first grade. The mathematics section contains 55 items and requires 20 minutes to administer.

A set of equivalencies has been developed for interpretation of results in longitudinal studies. Thus scores on the Primary Battery I of SAT can be compared with scores on SESAT. This is a most valuable asset for this study.

Problem-Solving and Conservation

The inclusion of measures of problem-solving and conservation in the battery represents an attempt to measure cognitive development in two broad areas which transcend particular curricula or course offerings. Problem-solving reflects the child's ability to cope with both in-school and out-of-school situations. Conservation reflects that developmental level described by Piaget as being prerequisite to formal thinking operations.

The two instruments selected to measure these variables were developed as part of the USOE Belmont project and were specifically designed to minimize ethnic and social class bias, and to be free from dependence on reading ability (Asher, et al., 1971). They are the Purdue Elementary Problem-Solving Inventory and the Purdue Concept Formation Test - Conservation.

The problem-solving test originally used 35 mm slides to project stimulus material and the concept formation test used 16 mm motion picture film. Both tests, however, have been adapted to booklet editions and pretested on disadvantaged children (McDaniel, Feldhusen, Wheatley & Houtz, 1973). The booklet editions will be used in this study.

Problem-Solving

The Purdue Elementary Problem-Solving Inventory (Feldhusen, Houtz & Ringenbach, 1972) was designed to assess the general problem-solving ability of disadvantaged elementary school children from various ethnic backgrounds and grade levels. The original slide form of the test consisted of 48 items presenting problem situations in cartoon form. An oral script covered the beginning directions, a verbal statement for each item, and all directions necessary to guide the children through the entire test.

The following is a description of the 12 item-types included in the inventory.

(1) Sensing the problem: Ss are shown a cartoon and asked to determine if there is or is not a problem. (6 items, one example)

(2) Identifying the problems: Ss are shown a picture of a problem situation, given several verbal statements, and asked to identify the one statement which specifies the problem. (5 items)

(3) Asking questions: Given a cartoon and an oral statement of a problem situation, Ss are given a series of groups of three questions and asked to pick from each three the questions which would be most useful in clarifying the problem. (6 items, one example)

(4) Guessing causes: Given a cartoon and an oral statement of a problem situation, Ss are next given a series of three possible

causes for the problem and asked to pick the one which would be the most likely cause of the problem. (2 items)

(5) Clarification of goal: Ss are given a partially or ambiguously defined task or goal and asked to select from each of the groups of three alternatives offered, the question or piece of information which would clarify the goal or afford an adequate search model. (2 items)

(6) Judging if more information is needed: Given a cartoon and an oral description of a problem situation, Ss are asked to judge whether sufficient information is or is not available to proceed to a solution. (3 items)

(7) Analyzing details of the problem and identifying critical elements: A problem is presented in a cartoon with an oral description including full statement of the goal. Ss must identify those elements of the situation which are needed in producing a solution. (3 items)

(8) Redefinition or transformation: Given a cartoon and oral description of a problem, Ss are asked to indicate which things in the cartoon could be used to yield a solution. Ss are required to redefine or transform common objects in order to see their potential use. (4 items)

(9) Seeing implications: Given a problem and a proposed solution, Ss are asked to pick from groups of three the most likely result if the given solution were implemented. (6 items)

(10) Verification: Given a problem situation, Ss are asked to select the next step from three stated alternatives, the correct one depicting a testing, validation, or verification activity. (4 items)

(11) Solving a single solution problem: Presented with a problem situation, Ss are required to select from three stated alternatives the alternative which will solve the problem. (3 items)

(12) Solving a multiple solution problem: (a) Unusual solution: Presented with a problem situation, Ss are asked to choose from among three cartoons, the one that represents the most unusual solution to the problem. (3 items) (b) Best solution: Presented with a problem situation and three stated solutions, all tenable, Ss are asked how they would solve the problem. (3 items)

A three-way analysis of variance was computed using total scores and scores on the subscales of the inventory obtained from 1073 children in grades 2, 4 and 6 in Gary, Indiana on the original 35 mm slide edition of the test. The ethnic factor accounted for only 3% of the total variance, suggesting applicability of the test across ethnic groups without undue bias. The reliability of the 25-item

booklet edition of the test was computed for two separate studies (McDaniel, et al., 1973). In the first study, a Kuder-Richardson 20 reliability coefficient of .55 was obtained for 142 children in grades 2 and 4. In the second study, a Kuder-Richardson coefficient of .79 was obtained for 192 children in grades 2 and 4.

Conservation

Tests of conservation typically involve a child watching an examiner perform transformations on objects and being questioned about changes in the objects. For example, a child watches while milk is poured from a short, shallow container into a tall thin one. The child is then asked whether there is more, or less, or the same amount of milk as before. Because of the equipment needed, these tests have generally been conducted by individual examiners testing one child at a time.

The original form of the Purdue Concept Formation Test - Conservation placed the examiner on a 16 mm color motion picture film. On the film, the examiner performed 21 transformations using milk, beans, blocks, clay, rods, and cardboard cutouts representing areas. After each transformation, the child marked an answer sheet indicating whether the new display contained more, less or the same amount as the original. The test has been tried on a large number of pupils in grades 1 through 6 and can be handled without difficulty by children at those grade levels.

The 16 item booklet edition was tested with 194 students in grade 2 and 172 students in grade 4. The K-R 20 reliability coefficient was .84.

Preliminary forms of this test using the motion picture, administered to approximately 300 children at grade 4 and 300 children at grade 6 correlated with the Lorge-Thorndike Verbal I.Q. scores .27 at the fourth grade and .24 at the sixth grade, suggesting a measure which is relatively independent of verbal ability. Correlations with arithmetic achievement tests, however, suggest that the conservation measure may be fairly important in certain kinds of school achievement. At the fourth grade level, these correlations were .39 for arithmetic concepts and .53 with arithmetic problems. At the sixth grade level, the correlations were .21 and .20 respectively.

Attitude Toward School

The criticism of measurements of limited school outcome variables is sounded by Averch et al., (1971) in a critical review and synthesis of research findings. He lists this deficiency among the most pervasive limitation of educational research:

> First, educational outcomes are almost exclusively measured by cognitive achievements. But the educational system has many functions and many outputs. Cognitive achievement, in particular that part measured by standardized tests, is only one aspect of student learning (p. 153).

Bloom (1964) says that the consequences of repeated success or failure over several school years must have major effects on the individual's view of himself and his attitudes toward school and school learning. Holt (1964) believes that attitudes are very important ends in themselves. He states that since attitudes may be all that a child really gets from school, they ought to be positive ones.

Reliable instruments designed to measure attitude toward school for children in the elementary grades have generally been scarce. Those instruments which have been used have varied in method, quality, and intended recipients.

Glick (1970) used the Pupil Opinion Questionnaire. This instrument contains 60 Likert scale items with subscales measuring disposition toward (1) school teachers, (2) school work, (3) classmates, and (4) school in general. Intercorrelations among the components ranged from .29 to .81 for five randomly selected classrooms. October to May test-retest correlations of total scores within the same five classrooms ranged from .39 to .75, with an average of .73. Reliability of the subscales was not reported. This instrument has been standardized for use with sixth grade students.

Jackson and Lahaderne (1967) revised the Student Opinion Poll (Jackson & Getzels, 1959) and the Michigan Student Questionnaire (Flanders, 1965) and administered both revisions to 292 sixth grade pupils. The Student Opinion Poll was designed to elicit responses to four aspects of school life: teachers, curriculum, student body, and classroom procedures. The revised version contained 47 multiple choice items of the following format:

The things that I am asked to study are of:

a. great interest to me.
b. average interest to me.
c. little interest to me.
d. no interest to me.

In general, my feelings toward school are:

a. very favorable - I like it as it is.
b. somewhat favorable - I would like a few changes
c. somewhat unfavorable - I would like many changes.
d. very unfavorable - I frequently feel that school is pretty much a waste of time.

The Michigan Student Questionnaire contained descriptive statements about school and teachers. Jackson and Lahaderne revised this instrument to 37 items with the following format:

What we learn in class makes me want to learn new things.
strongly disagree disagree agree strongly agree

This teacher certainly knows how to teach.
strongly disagree disagree agree strongly agree

The correlation between responses to the revised versions of the Student Opinion Poll and the Michigan Student Questionnaire was .62 for the total sample, suggesting fairly stable attitude structures at the sixth grade level.

The Instructional Objectives Exchange (IOX) in Los Angeles has developed a series of instruments designed to measure affective components of the school environment. One of these instruments, entitled the School Sentiment Index, contains 81 statements related to six dimensions of the school environment. These six dimensions include teachers, school subjects, learning, social structure and climate, peers, and school in general. Internal consistencies for the subscales ranted from .47 to .76, while the internal consistency of the instrument as a whole was .80. Items with a correlation of .20 or more on the item homogeneity index are used Authors report a high intercorrelation among the subscales.

Ehrlich (1968) working with Thorndike and Hagen at Columbia University, constructed an attitude inventory with 120 Likert-type items. These items were derived from student compositions on the subject, "How I Feel About School." Factor analyses of the items were computed by grade, sex, and for the total group. The resulting twelve functional dimensions of attitude included: generalized negative affect, general enthusiasm, need for activity, feelings about classmates, reactions to order and aesthetics of the school plant, feelings about own teachers, feelings about the principal, perception of behavior, learning and ambition, anxiety, reaction to authority figures, feelings of persecution or unjust treatment. This instrument was administered to 1,053 pupils in grades 3-6. Ehrlich concluded that scales of Likert-type are feasible for use with young children beginning at the third grade level, the construct "attitude toward school" is multi-dimensional, and the factor pattern of the dimensions varies

from grade to grade and between sexes. Also key periods of change in the attitude toward school were found at the end of grade 3 and at the end of grade 6.

Ehrlich performed a second order factor analysis on her 12 dimensions and defined three major clusters. The first cluster reflects the child's reactions to the school setting and his interpersonal relations, including teachers, peers and parents, particularly as these reactions reflect generalized negative affect through such items as "I don't like reading," "There isn't much sense in learning what they teach us in school." The second cluster refers to the child's enthusiasm for school; how it satisfies his ambitions and need for pleasure in the environment provided, e.g., "School is fun most of the time." "My teacher helps me when I need help." The third cluster is an activity factor, expressing the child's need for physical activity and socializing: "You have to sit still too much in school," "We do not get enough time to talk to our friends in school."

Other measures of attitude toward school have included the semantic differential, interview techniques, Guttman scales, projective measures, and checklists. Few instruments, however, have been developed for use with children below the sixth grade level.

In addition to the paucity of instruments, few studies examine the elementary school child's attitude toward school and its relationship to other cognitive and sociological data. Those found in the literature have dealt primarily with the relationships to achievement, socioeconomic status, sex, and grade level.

The relationship of attitude toward school to achievement has not been clearly demonstrated. Early studies reported no significant relationships. Tonenbaum (1940) found no correlation coefficients above .13 between attitudes and I.Q., report card grades, and other measures of achievement. His sample consisted of nearly 500 sixth and seventh grade students. Tschechtelin, Hipsken and Remmers (1940) found no significant correlations between attitudes and group intelligence test scores for 527 junior high students. Malpass (1953) found little or no relationship between attitude and achievement on standardized tests. Jackson and Lahaderne (1967), after testing almost 300 sixth grade students, found correlations ranging from -.08 to .19 between attitude toward school and school grades; Stanford reading, language, and arithmetic scores; and Kuhlman-Anderson I.Q. scores.

Three more recent studies have found small but significant relationships between attitude toward school and achievement. Glick (1969) found high correlations between attitude and achievement for sixth grade children. Neale, Gill, and Tismer (1970) found significant correlations between sixth graders' attitudes toward specific school subjects and achievement. Alvord (1972) found a

correlation of .20 between school attitude and a measure of achievement in science for 1,105 fourth grade students. The studies cited suggest that attitude toward school tends to have low, but positive, correlations with achievement.

Research comparing attitude toward school and socioeconomic status has been inconclusive. Berk, Rose, and Stewart (1970) suggested from their review of literature that the socioeconomic status of the American child does not play a significant part in the determination of his attitude toward school. Their own study, involving over 500 fourth and fifth grade students, confirmed this expectation. Glick (1970), on the other hand, tested 14 sixth grade classrooms and found that high SES students had attitudes significantly higher than low SES students. Glick (1967), in a study involving four SES levels, found an inverted J-curve relationship between SES levels and school attitudes. He explained this in terms of an interaction between the quality of the school and the degree to which the school meets the needs of pupils relative to the need satisfaction offered by alternative available settings. Attitudes for many students in the lowest SES level take a favorable turn, possibly because the school can offer more than can the home and alternative neighborhood settings.

Several studies have attempted to determine if there are sex differences in attitude towards school. Fitt (1956), Lunn (1969), Berk, Rose, and Stewart (1970) found that girls' attitudes are more favorable than those of boys. However, Jackson and Lahaderne (1967) and Neale and Proshek (1967) found that attitude toward school was not a function of sex.

Several studies have indicated a negative trend in attitude toward school as the child grows older. Snyder (1965), Neale (1967), and Lefevre (1966) found that intermediate grade pupils tend to perceive activities associated with their learning activities more negatively than do primary grade children. Strickland (1970) states that attitudes tend to become more negative over the school career and even in the course of a school year.

Attitudes toward school are important, affective components in the life of the elementary school child. Yet, instruments designed to measure attitude toward school for children below the sixth grade level are few. Those instruments which have been developed present reliability and validity data only for the total score and none for the subscales. The following pages describe the development of an instrument to measure attitude toward school for elementary school students. Subscales of this instrument are designed to measure (1) attitude toward teacher, (2) attitude toward schoolwork, and (3) attitude toward school in general.

Development of Instrument

In the development of the instrument to measure attitude toward school, five successive forms of a questionnaire were designed and tested. Each form was tried in a school setting in order to (1) test the items, (2) establish administrative procedures, (3) check statistical and analytic methods and (4) provide ideas and approaches available only through direct testing.

Three preliminary editions led to Form IV, a 45 item instrument with subscales for attitude toward school in general, attitude toward schoolwork and attitude toward teacher. Tests and retests of Form IV were administered during February and March of 1973 to students attending a parochial school in New Orleans, Louisiana. Twenty-six students were in the fourth grade, 29 in the fifth grade, and 23 in sixth grade.

Teachers in grades 4-6 were asked to rate their students on attitude toward school. The fifth and sixth grade teachers rated their pupils on a scale from 1-100. The fourth grade teacher ranked her pupils to indicate the most positive to least positive attitude toward school. The correlations between the total score on Form IV and teacher ratings were .69 for grade 4, .60 for grade 5, and .66 for grade 6.

Four day test-retest correlations for Form IV are presented below:

	Grades		
	4	5	6
Schoolwork	.74	.86	.76
Teachers	.56	.74	.68
School in General	.83	.93	.76
Total	.86	.91	.80

The correlations between teacher rating and total score on Form IV are quite high when compared with other studies in which teacher ratings were compared to other criteria (Roshal, Frieze, & Wood, 1971). Scores on Form IV apparently measure attitudes which can be observed by teachers. The high test-retest correlations suggest score stability over a short period of time for the total score.

Form V, the final form, represents a further effort to improve subscale reliability and internal consistency. Thirty-nine of the 45 items used on Form V had shown substantial item-subscale correlations in the previous pilot studies. Six new items were developed.

The three subscales of Form V are attitude toward schoolwork, 14 items; attitude toward teachers, 14 items; and attitude toward school in general, 17 items. Form V was administered to 180 students in seven fourth grade classes in Indianapolis.

The item analysis for the Indianapolis data revealed no item-subscale correlations below .30 with the vast majority being above .40. The alpha estimates of reliability for this testing were .75 for attitude toward schoolwork, .79 for attitude toward teachers, and .81 for attitude toward school in general. The reliability for the total scale was .91. The percent of students choosing each response for Form V can be found in Table 4. The item-subscale and item-total correlations are presented in Table 5.

These data suggest that Form V of the attitude toward school measure is sufficiently well developed for use in subsequent studies. There is, however, a substantial intercorrelation among the subscales (schoolwork and teachers, .61; school work and school in general, .76; and teacher and school in general .69).

The high correlations suggest that the present instrument is essentially unidimensional in nature and may be measuring a single generalized orientation to the school environment. Whether this is an artifact of the instrument or reflects the actual nature of school attitudes cannot be determined at this time. Despite the apparent high overlap between the subscales of this instrument, there is some evidence from the correlations which follow (Table 6) that the subscales represent a degree of orthogonality.

Correlations with Other Variables (Grade 4)

It would seem logical that a child's attitude toward school would be related to several other variables. First, his general ability and achievement scores should be important, assuming that school attitude is not likely to be high if school is too difficult for the student, or if he is not doing well in the work required. Second, if a child's self-concept is markedly low or high, one might expect some generalization and projection of these perceptions onto the outer environment. Finally, it would seem that the parental aspirations for the child and the parental acceptance of the child would have a bearing on the way the child relates to both the schoolwork and the school teacher.

Low but positive correlations were found between attitude toward school and I.Q., measured here by Raven's Coloured Progressive Matrices (see Table 6). These correlations are higher than those found by Jackson and Lahaderne (1967). Orthogonality of the subscale is suggested by noting that the correlation between the Raven's and attitude toward schoolwork is higher than the correlations between the Raven's and the other two subscales of the attitude tests.

The highest correlations were found between attitude toward school and measures of achievement. These ranged from .28 to .43 and all were significant beyond the .001 level. Here again correlations between the subscale attitude toward schoolwork and achievement were higher than those for the other subscales. These correlations are among the highest found in the literature (Glick, 1970; Alvard, 1972).

Table 4

Percent of Students Choosing Each Response (Grade 4)

Attitude Toward School

Item Number	A	B	C	D	E
1	31	0	15	18	32
2	17	7	8	19	49
3	14	0	19	11	49
4	28	5	7	12	48
5	15	3	12	13	54
6	30	7	22	7	32
7	24	8	22	17	28
8	22	9	14	19	36
9	14	7	14	13	51
10	12	8	16	18	46
11	13	0	33	8	36
12	31	0	8	9	42
13	27	13	18	14	28
14	30	11	10	13	29
15	24	9	11	14	41
16	20	8	10	14	47
17	28	9	15	14	33
18	53	8	5	7	25
19	13	5	8	20	54
20	17	3	6	18	56
21	25	5	22	9	38
22	44	6	5	9	32
23	11	0	15	28	41
24	16	0	13	13	48
25	20	0	12	14	47
26	52	17	9	6	15
27	23	7	23	12	34
28	9	5	6	19	60
29	26	6	14	13	39
30	14	9	22	16	38
31	22	8	21	16	33
32	27	9	17	14	30
33	24	17	14	12	33
34	26	8	14	11	40
35	10	3	13	21	52
36	27	12	14	7	39
37	32	8	16	13	28
38	40	9	12	8	29
39	7	4	9	12	66
40	29	7	28	4	29
41	21	11	9	6	53
42	21	7	12	13	47
43	23	6	13	13	42
44	33	10	14	7	33
45	12	2	12	13	59

Table 5

Item-Subscale and Item-Total Correlations (Grade 4)

Attitude Toward School

Item Number	Schoolwork	Teacher	School in General	Total
1			.50	.53
2	.47			.41
3		.60		.54
4			.49	.45
5	.53			.45
6		.59		.53
7			.53	.44
8			.51	.47
9	.51			.45
10	.34			.36
11		.37		.28
12		.57		.53
13			.62	.58
14	.52			.45
15		.65		.51
16			.66	.62
17		.38		.28
18			.53	.52
19	.59			.58
20		.67		.59
21		.45		.39
22			.48	.37
23			.36	.42
24	.42			.31
25			.53	.54
26			.38	.30
27	.63			.63
28		.46		.41
29			.47	.46
30		.43		.29
31		.61		.52
32	.42			.32
33			.58	.52
34	.54			.46
35	.49			.42
36		.57		.48
37			.55	.54
38	.59			.55
39			.41	.42
40		.40		.38
41	.51			.42
42			.45	.41
43	.30			.24
44			.39	.35
45		.51		.36
N = 179				
Mean	49.2	48.5	54.8	152.5
SD	10.7	11.4	13.6	31.9
Alpha Coefficient	.75	.79	.81	.91

Table 6

Correlations Between Attitude Toward School

and Selected Variables (Grade 4)

Variable	N	Schoolwork	Teachers	School in General	Total
Raven's Total Score	169	.24*	.15	.15	.20*
Reading Achievement	179	.40**	.35**	.34**	.40**
Math Achievement	179	.43**	.28**	.32**	.38**
Self-Concept	175	.39**	.24**	.29**	.34**
Parental Aspiration for Child	58	-.32	-.34**	-.32	-.37*
Parental Acceptance of Child	86	.24	.24	.24	.27

** significant at .001 level
* significant at .01 level

It is interesting to note the apparent relationship between attitude toward school and self-concept. These correlations ranged from .24 to .39 and all were significant at the .001 level. This is consistent with references asserting a relationship between self perceptions and attitudes toward the school environment (Lunn, 1969, Berk, Rose, & Steward, 1970).

Attitude toward school and parental aspiration for child were negatively related. Correlations ranged from -.37 to -.32. Items concerning achievement were used on the Parent Questionnaire. These items refer to the degree of concern the parents have for the success of their children. The negative correlations between parental achievement motivation and attitude toward school may be related to Erhlich's observation that high enthusiasm for elementary school seems to be associated with low socioeconomic status. Perhaps parents with a high level of concern tend to expect too much of their children which could result in the child's lower attitude toward school. This is an area relatively untouched by research and one that needs further investigation.

Positive correlations were found between attitude toward school and parental acceptance of child. This could be somewhat anticipated. Although none of these correlations were significant at the .01 level, all were significant at the .05 level.

Correlations were found between attitude toward school (Form V) and several other educational and psychological variables designated for the longitudinal study. These are presented in Table 6.

In summary, the psychometric characteristics of Form V and the expected pattern of correlations with selected variables from the total battery suggest that the measure provides a useful estimate of student attitudes toward school. Form V will be used in its present form with grades 4-6 in the longitudinal study. The same form, with a yes-no answer sheet, will be used for grades 1-3.

Piers-Harris Children's Self-Concept Scale

Much support has been given to self-concept as a construct by researchers in the fields of education and psychology. This construct is regarded by many to be central to the individual in terms of how that individual interacts with his environment both socially and cognitively. Cofer and Appley (1964) state:

> Because the self participates in all of life's experiences the strength of the pervading self-concept is seen as the most important (generalized) source of motivation for social behavior (p. 321).

The individual interprets stimuli and selects responses relative to his concept of himself.

Relating self-concept specifically to education, Prukey (1970) states that, "There is a persistent and significant relationship between self-concept and academic achievement at each grade level..." (p. 27). Diggory (1966) notes a positive relationship between academic aspirations and level of self-concept. Drier and Haupt (1966) found that independence, achievement and affiliative behavior are enhanced by high levels of self-concept. Brookover, Thomas and Patterson (1964) have established that teachers influence a child's self-concept. Therefore, it is important to investigate this construct if one is interested in discovering how various school settings affect the cognitive and/or affective functioning of the child. Moreover, it is important to investigate self-concept as it develops over time. Wylie (1961) wrote:

> At present there are no longitudinal data on which to base a description of the development of self-concept. In lieu of such data one might think that results from cross-sectional studies of various age groups could be pieced together to attain a tentative developmental picture. This is impossible, however, due to the wide differences in instruments, relevant characteristics of Ss, and testing conditions in the studies under review (p. 119).

Selection of Instruments for Grades 4-6

As a measure of self-concept in school age children, the Piers-Harris Children's Self-Concept Scale was chosen. This scale contains 80 items and may be administered to groups or classes, grades 3-6, in a 30-40 minute sitting. The child answers yes or no in response to whether or not a particular statement is generally true of himself, for example: I am obedient at home; I am dumb about most things, I wish I were different. A score is computed for 5 factors, behavior, school, social, physical and anxiety, as well as a total scale score.

In evidence of construct validity, the Piers-Harris manual reports a correlation of .68 between the total score on this scale and the score on the Lipsitt's Children's Self-Concept Scale. Correlations

of .43 and .31 were found between this scale and teacher and peer ratings of socially effective behavior for both boys and girls. Correlations with achievement for 54 boys and 57 girls in the 4th grade were .32 and .43 respectively.

Test-retest reliability was estimated to be .72 for 56 third graders after a four month period. Internal consistency as calculated by the Kuder-Richardson 20 formula was .90 for 56 girls and .93 for 63 boys in the third grade. (Additional statistical evidence of reliability and validity can be found in the Piers-Harris manual.)

A second factor analysis was done by Stanwyck in 1972. This factor analysis was done on the results of a study of 800 subjects from grades 2 through 8 in a white middle class school. Results again yielded a five factor breakdown similar to that reported in the Piers-Harris Manual, with some items loading into slightly different factors. The factors are labeled feeling self, behaving s ..., school self, social self and body self; each factor accounted for 22, 21, 18, 10 and 7 percent of the variance, respectively (Stanwyck, 1972). The factors from the Stanwyck analysis are used in the current work since they are based on a larger, more representative sample and because the analysis is more recent.

The full Piers-Harris scale, as published, was administered to 4th graders in inner city Indianapolis schools. A test administrator read the statements to the students and they recorded their responses on standard op-scan answer sheets. A response of agreement that the statement was true of the individual was coded A and a response of disagreement was coded B.

On the day the test was administered in the schools, 195 students were present. Out of this sample, 10 answer sheets were discarded due to a large number of omissions (5 or more), or flagrant irregularities in responses, i.e., all responses being yes or no, a pattern of alternating yes and no, etc. The analysis of the data is therefore based on 185 answer sheets.

The item-subscale and the item-total correlations are reported in Table 7. Kr-20's, means and standard deviations for the total and each subscale are also reported in Table 7. Internal consistency as measured by the Kr-20 formula for the total scale score and the behaving, school, feeling, social and body self subscales were as follows: .89, .81, .82, .80, .58 and .65 respectively. The mean for the total score was 50.06 and the standard deviation for the total score was 12.26.

The item analysis data and internal consistency coefficients obtained for this sample of children suggest that the total score and the first three subscale scores (Behaving Self, School Self, and Feeling Self) are sufficiently reliable for use in the study. The last two subscales Social Self and Body Self) exhibit limited reliability and will be most useful in analysis focusing on group means.

Table 7

Item-Subscale and Item-Total Correlations (Grade 4)

Piers-Harris Children's Self-Concept Scale

	Item - Subscale Correlations					
Item	I Behaving	II School	III Feeling	IV Social	V Body	Total Score
1	.35					.27
2				.38		.20
3	.43			.54		.40
4	.38					.30
5		.57				.41
6	.40					.33
7	.43					.30
8	.46					.47
9		.36				.09
10	.42					.36
11	.37					.27
12		.33	.44			.40
13	.37					.31
14			.50			.36
15		.51				.26
16		.44				.23
17		.41				.27
18					.44	.30
19		.39				.21
20	.36					.30
21		.55	.33			.40
22			.58			.42
23		.53				.32
24		.45				.35
25			.59			.43
26			.52			.45
27		.48				.26
28	.43					.33
29		.56			.69	.32
30		.54				.32
31			.53			.38
32			.36			.16
33		.50		.39		.36
34			.50			.28
35			.58			.40
36	.38					.32
37	.36					.27
38	.33					.21
39			.40			.25
40	.51					.41

Table 7 (contd.)

Item	Item - Subscale Correlations					
	I Behaving	II School	III Feeling	IV Social	V Body	Total Score
41		.58			.68	.38
42		.33				.14
43		.61			.72	.38
44	.13					.16
45			.37			.25
46	.49			.50		.39
47	.32					.50
48			.52			.35
49		.56				.42
50	.52			.55		.45
51				.60		.42
52				.55		.40
53.	.44		.54			.49
54		.65			.73	.41
55		.34				.29
56			.52			.29
57		.36				.23
58	.55			.52		.45
59			.60			.46
60	.42				.55	.44
61	.45					.42
62	.28					.29
63		.37				.26
64	.37					.42
65	.45					.35
66	.45		.50			.41
67				.37		.36
68			.38			.33
69		.33				.21
70		.33				.30
71	.29					.23
72				.42		.27
73					.58	.44
74	.45					.30
75	.36					.33
76	.37					.33
77	.20					.10
78			.50			.41
79			.43			.30
80		.41	.44			.45
N = 185						
Means	18.96	15.92	13.36	6.88	4.45	50.06
SD	6.00	5.41	4.69	2.16	2.11	12.26
KR 20	.81	.82	.80	.58	.65	.89

Correlations with Other Variables (Grade 4)

According to previous research and theory it is expected that self-concept will correlate with achievement, independence and affiliative behavior. For the Indianapolis testing achievement was measured in the areas of reading and mathematics. Independence was measured by the Individual Action subscale of the Peer Rating Scale and the Independence subscale of the Pupil Information Booklet. One scale on the Parent Questionnaire also reflects parental press for independence. The Peer Rating Scale and Pupil Information Booklet contain ratings of a child's overt independent behavior. It should be noted however that the Parent Questionnaire measures how much independent behavior is encouraged by the parent. This may or may not be reflected in the child's actual behavior. Finally, affiliative behavior is measured by both the Peer Rating Scale on subscale III (Affective Relationships) and the Pupil Information Booklet on subscale III (Social). Correlations between self-concept (total score) and these selected variables are presented in Table 8.

Self-concept was found to be moderately correlated with reading achievement ($r = .32$, $p < .01$) and math achievement ($r = .39$, $p < .01$). Small but significant correlations were found between the total self-concept scores and the Individual Action and Affective Relationships subscale scores of the Peer Rating Scale. No significant correlations were found between self-concept and the Independence or Social subscales of the Pupil Information Booklet or between self-concept and the Maturity Demand subscale of the Parent Questionnaire.

In summary, total scale self-concept scores were found to be moderately correlated with both achievement scores; however, self-concept was not found to be related to measures of independence and affiliative behavior.

Development of Instrument for Grades 1-3

For the purposes of measuring self-concept of first grade children, a shortened form of the Piers-Harris Children's Self-Concept Scale was developed. To select items for the short form, data from two earlier studies conducted at Purdue were used. In the first study the full Piers-Harris scale was administered to 413 third graders attending predominately black ghetto schools in Indianapolis. In the second study the Piers-Harris was administered to 119 second grade white suburban students. Item analyses were computed for each subscale reported by Stanwyck (1972) and for those subscales reported by Piers-Harris (1969). Items initially chosen for the shortened scale were those which correlated at least .30 with the total and appropriate subscale totals for the two studies. These items were inspected for appropriateness of vocabulary for first grade children. An attempt also was made to balance the number of items representing each of the factors. The final form contained 40 items which could be grouped into three of the factors reported by Stanwyck: feeling self, 16 items; school self, 14 items; and behaving self, 10 items.

Table 8

Correlations Between Self-Concept and Selected Variables (Grade 4)

Scale	N	Correlation
Reading Achievement	184	.32**
Mathematics Achievement	184	.39**
Peer Rating Scale		
Individual Action	185	.13*
Affective Relationships	185	.18*
Pupil Information Booklet		
Independence	17	.24
Social	17	.17
Parent Questionnaire		
Maturity Demand	89	.02

*$p < .05$ (one tail test)

**$p < .01$ (one tail test)

Answer sheets with Yes-No response positions were prepared for primary grade children. Small pictures (e.g., a dog, fish, boot) were used as place markers for the items.

This test was administered to 168 first grade pupils in Indianapolis. Out of this sample, 25 answer sheets were discarded because of a large number of omissions or obvious irregularities in responding. The following analysis, therefore, is based on the responses of 143 pupils.

The item analysis is summarized in Table 9. Item-subscale correlations are considered more important than item-total score correlations in view of the effort to obtain independent scales.

Four of the 16 items on subscale I fall below the criterion of .30 correlation with the subscale score. One item in each of the other subscales failed to meet this criterion. The wording of each of these items, together with thirteen items identified by examiners as containing troublesome vocabulary, were revised before inclusion in the final form reproduced in the Appendix. The results reported in this section are for the wording used in the Indianapolis testing. The reliability of the subscales appears to be too low to warrant analysis of individual scores. The total self-concept score, however, is sufficiently reliable for use in the study.

Correlations with Other Variables (Grade I)

Table 10 presents the correlations between self-concept total score and selected variables. The total self-concept scale score was correlated ($r = .23$, $p < .01$) with reading achievement and ($r = .42$, $p < .01$) with math achievement. A significant correlation was found between the self-concept score and the Independence subscale ($r = .45$, $p < .05$) and the Social subscale ($r = .59$, $p < .01$) of the Pupil Information Booklet. No significant correlations were found between self-concept and the subscales of the Peer Ratings. Self-concept was not correlated with the Maturity Demand subscale of the Parent Questionnaire.

The total self-concept score for first grade pupils was significantly correlated with achievement scores and some measures of independence and affiliative behavior. It was not correlated with selected measures obtained from peer ratings or parent questionnaires.

In summary, the Piers-Harris Children's Self-Concept Scale, as published, appears to be a good choice for pupils in grades 4-6. The shortened modification of this instrument seems appropriate for children in grades 1-3. The total score for both levels is sufficiently reliable for all analyses specified for the study. Selective use can be made of the subscale scores.

Table 9

Item-Subscale and Item-Total Correlations (Grade I)

Piers-Harris Children's Self-Concept Scale Adapted for Primary Grades

Item	Item - Subscale Correlations			
	I Feeling	II School	III Behaving	Total Score
1	.30			.33
2	.32			.29
3	.34			.29
4	.34			.18
5			.45	.23
6		.32		.24
7		.41		.22
8		.44		.21
9	.29			.22
10		.53		.37
11			.54	.40
12			.43	.29
13		.42		.17
14		.55		.32
15		.27		.37
16			.14	.27
17			.55	.36
18	.18			.07
19	.36			.33
20		.47		.36
21		.63		.41
22			.51	.46
23		.47		.26
24		.54		.35
25			.45	.32
26		.32		.29
27		.37		.26
28	.45			.32
29	.39			.32
30	.41			.22
31	.27			.16
32	.29			.17
33	.30			.29
34			.52	.39
35	.43			.32
36		.42		.29
37			.37	.28
38	.33			.28
39			.43	.31
40	.47			.52
N = 143				
Means	7.64	8.81	6.40	22.85
SD	2.72	2.67	2.32	5.64
KR 20	.48	.67	.53	.73

Table 10

Correlations Between Self-Concept and Selected Variables (Grade 1)

Scale	N	Correlation
Reading Achievement	138	.23**
Mathematics Achievement	137	.42**
Peer Rating Scale		
Individual Action	138	.04
Affective Relationships	138	.13
Pupil Information Booklet		
Independence	16	.45*
Social	16	.59**
Parent Questionnaire		
Maturity Demand	63	-.06

* $p < .05$ (one tail test)
** $p < .01$ (one tail test)

Peer Ratings of Personal-Social Development

This section describes the rationale for and the development of an instrument to measure socialization in grade school children. The goal was to develop an instrument which would provide an overall index of socialization, embrace the major aspects of socialization, and, if possible, provide diagnostic subscales.

Most definitions of socialization specify a learning of social behaviors and their consequences (Glidewell, 1966) or an acquisition of social knowledge, skills, and attitudes (Brim, 1966). Socialization is the process by which an individual learns to interact with others. The family and the school are the primary agents of the socialization process. The research reported in this investigation focused upon the school, and in particular, upon the school peer group. Goslin (1969) concluded that the peer group is second only to the parents in socializing the child and is probably more powerful in socialization than are teachers. Glidewell (1966) reported that a very stable social structure exists in elementary classrooms. Goslin (1969) suggested that this social structure is not equally facilitative for all children:

> The schools cannot claim a clean bill of health in developing socialization. Discrimination is rampant on subtle as well as obvious grounds. Pressing socialization needs such as in the sexual-social area are all but ignored. (Lower-class youngsters, minority group youngsters, non-conforming youngsters, borderline ability youngsters--all are shamefully ignored or even openly discriminated against. The socialization record becomes worse as the child moves from first to twelfth grade [p. 811].

Bauer (1971) also reported that "...there is a growing conviction that guiding children and youth in the development of well-balanced, effective personalities constitutes the teacher's single most important function [p. 65]."

A review of the socialization literature identified twelve construct variables related to the socialization process. These construct variables can be logically organized into three groups--individual prosocial action, social interaction and affective relationships.

Individual Prosocial Action	Social Interaction	Affective Relationships
Leadership	Cooperation	Liking Others
Independence	Conformity	Social Acceptance
Assertiveness	Authority Relations	Being Liked
Competitiveness	Control of Aggression	Popularity

It should be noted, however, that the grouping into three areas did not really emerge explicitly until later in the scale development activity. In the following paragraphs the twelve construct variables will be defined and selected references from the research literature will be cited.

Individual Prosocial Action

The social behaviors included under individual prosocial action all reflect independent, outgoing, assertive social action on the part of the individual. The crucial aspect is the individual's positive behavioral thrust toward others.

Leadership is the ability to utilize and direct the ideas and actions of others in the pursuit of goals or solution of problems. Ahlbrand (1972) and Durojaiye (1969) found relationships between leadership and popularity. Stogdill (1948) indicated that leadership exhibited in various school situations may be predictive of continued leadership in community life.

Independence is the ability to think for oneself and accept social responsibility. In a review of socialization, Zigler and Child (1969) reported that "...the diminishing dependence of the child as he grows older involves positive development of more independent modes of responding to the same situations that formerly elicited dependent reactions... [p. 543]." Zigler and Child also concluded that social deprivation as well as overprotection can produce increased child dependence. Winterbottom (1958) found that childhood independence training was positively related to achievement motivation. Dunnington (1957) compared observer ratings of preschool children with sociometric nomination data and found that popular children were more independent than less popular children. Research by Sears, Maccoby, and Levin (1957) and by Whiting and Child (1953) suggested that a culture's attitude toward dependence was related to the independence training it employed.

Assertiveness refers to the ability to take initiative, express ideas, respond to questions, and in general show confidence. The individual achieves a degree of self-assertion within a group by interpreting his own status in relation to those around him (Campbell, 1964). Borgatta (1963) factor analyzed observation data gathered with a social behavior rating scale and identified assertiveness and sociability as the two most prominent factors. Patterson and Anderson (1964) reported that active-assertive boys were very responsive to peer approval. Borg (1960) found a strong relationship between assertiveness and creativity ($r = .42$) and between assertiveness and leadership ($r = .39$). Holzberg and Posner (1951) found a significant positive relationship between a sociometric measure of assertiveness and supervisor ratings of assertiveness in student

nurses.

Competitiveness is an inner-directed need to achieve a standard of excellence in all of one's actions. This definition of competitiveness places less emphasis on the notion of competing against others. Kagan (1962) viewed competitiveness as the desire to become involved in games or tasks that test or require superior ability. The need to compete against oneself or against standards of excellence has been researched extensively by McClelland (1961) as part of the need for achievement theory.

Social Interaction

The next four construct variables--cooperation, conformity, authority relations, and control of aggression--are termed social interaction construct variables because they arise as a result of an individual's interactions with others on an individual and on a group basis.

Cooperation is the ability to work compatibly with others toward a common goal. Piaget (1954) viewed cooperation as the developmental trend which reflects the child's movement from an egocentric perspective to one that includes others. Schmidt (1958) found that boys who scored high on a sociometric measure also tended to be cooperative. Peterson (1968) reported a positive relationship between peer acceptance and work participation. Evans (1966) concluded that research evidence indicates that cooperative groups serve to improve personal adjustment. Evans also indicated that "...a judicious mixture of co-operation and competition might be the most effective method of dealing with most classes [p. 78]."

Conformity is the ability to behave according to norms and rules, when appropriate, instead of behaving according to personal inclinations or wishes. The conformity referred to here is of the enlightened variety, whereby the individual chooses to conform for acceptable reasons rather than blindly agreeing with the majority. Goslin (1969) defined conformity as "...an adaptive accomplishment to be explained in terms of complex mechanisms integrating individual behavioral dispositions with the needs of the social structure [p. 508]." Thompson and Divesta suggested that "...the development of conforming behavior patterns runs parallel with the socialization process [p. 306]." Many researchers (Campbell, 1964; Coleman, 1961; Kagan, 1962) have pointed to the pressures to conform that are exerted by the peer group.

Authority relations refers to the ability to relate to or interact with figures of authority. Getzels (1969), in his delineation of a framework for a social psychology of education, argued that the relationship between the school as authority and the student as individual is dependent upon the interaction between the formal structure of the school, the informal structure of the student culture,

and the personal characteristics of the student. Sometimes, as Gordon (1957) discovered in his study of a high school, a clash occurs between the formal structure of the school and the informal structure of the student culture. The resolution of this conflict is usually left up to the teacher.

Coleman (1961) investigated student cultures in ten diverse high schools. Using data that included peer ratings and attitude responses, Coleman found that academic performance was dependent upon the value placed on grades by the student culture. Although the Gordon and the Coleman studies emphasize the influence of the student culture, many researchers (Lewin, Lippitt, & White, 1939; Sanford, 1962; Shaw, 1959) have confirmed the hypothesis that the formal structure of the school and also the classroom peer climate influence student behavior. Kidder (1971), analyzing the classroom social variables for 275 fifth graders, found a significant positive relationship between students' status in the classroom and their affective reactions to parents, school, teacher, and principal. Thus it appears that students' ability to interact with authority figures is related to other aspects of development.

Control of aggression refers to one's ability to inhibit verbal and physical expression of hostility and anger, especially when faced with frustrations. According to Kagan and Moss (1962) "...the display of aggressive acts is a regular concomitant of development. Aggression is subject to socialization pressures, for the child does not have complete license to unleash his anger when in classes." Bandura and Walters (1959) concluded that the "...process of socializing aggression involves training the child to react to frustration in ways that are relatively acceptable [p. 453]." Bandura and Walters (1963) proposed that modeling or imitation of aggression occurs when aggressive acts are rewarded or go unpunished. Zigler and Child (1969) also noted that positive reinforcement of aggressive responses can come from "parents, peers, or others [p. 533]." Thompson, et al. (1971) suggested that schools train children to control their aggression and redirect their energies along more socially approved lines.

Affective Relationships

The next four construct variables--liking others, social acceptance, being liked, and popularity--represent the affective components of social relationships. Although many of the socialization construct variables already mentioned in this review undoubtedly have a certain amount of affective content, the next four construct variables are predominantly affective in nature. Most research on affectivity in socialization has been global and general few researchers have focussed on separate aspects. Thus there seemed to be a special need to consider such a development.

Liking others is the desire to interact positively with others. McCandless (1967) stated that a successfully socialized person

"...rather likes people and has a generally positive attitude toward the rules of his society [p. 340]." The liking others variable is much like need for affiliation, hypothesized by Murray (19_), and later researched by McClelland, Atkinson, Clark, and Lowell (1953) as well as by Schachter (1959). Lindzey and Byrne (1968) reported that "...the role of need for affiliation in various types of sociometric situations is just beginning to be explained [p. 502]." Mann (1967) developed a behavior rating system that included an affective category. Dunnington (1957), as well as Lippitt and Gold, (1959) found that sociometrically popular children showed more signs of liking and reaching out to others than less popular children.

Social acceptance refers to a willingness on the part of the social group to allow a particular member to participate in group activities. Northway (1944) suggested that sociometric data are an index of a person's acceptance within a specific social setting. The social acceptance construct represents the minimally favorable group reaction to an individual member. Social acceptance is often viewed as the first crucial sign or characteristic of socialized behavior. To be accepted implies that an individual has acquired some appropriate socialization skills.

Being liked refers to affiliative feelings that are expressed by individual group members toward a particular group member. Being liked implies probable social acceptance in group situations. Being liked thus involves a higher social status than does social acceptance. Gronlund (1959) reported that children are liked by their peers because they possess personality characteristics such as kindness, generosity, agreeableness, sincerity and friendliness. Ahlbrand (1972) also found that children are liked because they are cooperative and friendly.

Popularity, or social status, indicates that an individual is liked by most of the social group. Berkowitz (1969) defined social status as "...a person's ranking in his group according to some hierarchy of prestige or worth [p. 84]." Gronlund (1959) suggested that social status is indicative of potential for leadership. Popularity is the most well known and widely researched of affective socialization variables.

While the twelve construct variables and the three logical scale groupings served to provide a comprehensive rationale for the later development of a peer socialization rating scale, it should not be assumed that complete orthogonality of constructs or scales was expected. The major purpose in identifying these theoretical components was to assure comprehensiveness in developing a socialization measure.

Development of Instrument

The socialization literature review was used in considering ways to operationalize measures for assessing the socialization construct variables. One aspect of the investigation involved a review of standardized instruments described in Buros' Mental Measurement Yearbook (1972) and the UCLA Center for the Study of Education publication, Elementary School Test Evaluations (1970). These reviews indicated that four measures--the Bristol Social Adjustment Guide, the California Test of Personality, the Early School Personality Questionnaire, and the Personal Adjustment Inventory--warranted further consideration. However, examination of specimen sets of the four measures showed that each failed to measure more than a couple of the socialization constructs identified. Lack of subscale reliability and validity information for these measures precluded formation of a tailored socialization instrument composed of an assortment of subscales. In summary, the review of published standardized instruments showed that no suitable instrument exists and that one cannot be assembled using subscales from existing standardized instruments.

Secondly, the usefulness and feasibility of supplementing or replacing the typical self-report measurement approach with a sociometric technique of measurement was considered. The sociometric method usually involves group members naming or "nominating" those peers with whom they would like, or perhaps not like, to perform some criterion behavior. Gronlund (1959) as well as Lindzey and Byrne (1968) have reviewed the sociometric method extensively. It is generally agreed that a sociometric test, properly constructed and administered, can yield reliable and valid information on the peer group. Although the traditional sociometric method has several important advantages, it also has several weaknesses that must be overcome if the method is to be truly useful.

One disadvantage of the sociometric method is that "...studies have shown that a large number of pupils tend to choose the same few highly chosen individuals (Gronlund, 1959, p. 48)." The result is that many group members receive no score, and this in turn produces severely skewed distributions. Another disadvantage (Gronlund, 1959) is that nominations "...on personal and social criteria have shown considerable overlap when used in educational settings [p. 43]."

Despite the weaknesses of the sociometric method, some researchers have reported moderate success in using it. Bauer (1971) found that the 60 most preferred and the 60 least preferred students (grades 10, 11, and 12; total N = 162), according to a sociometric questionnaire, differed significantly in their scores on the

California Test of Personality. The most preferred students were better adjusted, both personally and socially. Tuddenham (1952) found that childhood personality was related to reputation among peers at the first grade level. Lindzey and Byrne (1968) reported that sociometric measures under some conditions can be used as a direct measure of leadership [p. 405]. Havighurst (1972) made extensive use of sociometrics in a cross-national study. These several studies indicated a sociometric instrument could yield useful assessment.

The sociometric method, although useful to a certain extent, has several serious weaknesses. However, a peer rating approach can overcome the weaknesses of the sociometric method, provided 1) several randomly assigned raters are employed for each ratee, and 2) a modification of the item sampling technique is used.

Although personality measurement has tended to overlook the peer rating approach in favor of self-report inventories (Smith, 1967) a logical comparison of the two techniques suggests that, for situations involving extensive social interaction, peer ratings have advantages perhaps not to be found in self-report data. Smith (1967), for example, cited the following advantages of peer rating data.

1) The information used is generated in the non-test context of the individual's real-life environment.

2) It taps responses to peers accumulated over long periods of time rather than during one particular test period.

3) It is accumulated and stored by numerous observers with whom the individual has differing personal relationships, and who, consequently, view him from different perspectives [Pp. 968-969].

The question of who can accurately rate behavior has generated extensive research (e.g., Allport, 1937; Bruner & Taguiri, 1954; Taft, 1955), but Lindzey and Byrne (1968) concluded that

> Everyone is an experienced rater when it comes to social judgments. Each of us has a vast body of experience in deciding with whom we wish to interact and whom we wish to avoid....One might say that the individual who uses these techniques is taking advantage of the largest pool of sensitive and experienced raters that is anywhere available [p.454].

Empirical support for the usefulness, reliability and predictive validity of peer ratings of personality has been reported by several researchers (e.g., Astington, 1960; Carroll, 1952; Doll, 1963). Smith (1967)

administered 42 personality rating items (Cattell, 1957) to 348 students in a small junior college. He concluded that the peer rating data had high reliability (split-half, r = .83), high predictive validity (with grade point average as a criterion), and a highly stable factor analytic structure. Other research by Gibson and Hanson (1969) showed that data obtained from 353 boys aged ten or older, using a peer rating instrument involving seven personality characteristics, was comparable to teacher ratings of students and predictive of delinquency. Extensive research findings were reported by Lorber (1970) for the Ohio Social Acceptance Scale. This is a sociometric rating questionnaire in which children nominate their best friends and rate them on a variety of socialization dimensions. Lorber concluded that the rating scale possessed good reliability and validity. The peer rating approach thus seems to be a viable approach to the assessment of socialization.

Our consideration of the strengths of the peer rating approach should, of course, be balanced by a consideration of the possible problems that can accompany the use of the peer rating technique. Guilford (1954) identified the following possible sources of error in rating data:

1) rater response tendencies such as leniency or oversaverity

2) unique rater-ratee relationships

3) rater unfamiliarity with ratee

4) faulty item construction

The first source of error, rater response tendencies, can be reduced by employing rating items that involve familiar day-to-day activities (Gronlund, 1959). Rotter and Tinkleman (1970) asserted that behavioral ratings are reliable and valid for clearcut items, whereas ambiguous items may introduce rater response tendencies. The second source of rating data error, unique rater-ratee relationships, can be minimized through random assignment of ratees to raters. This procedure reduces to chance the likelihood that unique rater-ratee relationships will occur. The third source of rating data error, rater unfamiliarity with ratee, is minimized by obtaining peer ratings from groups which have been intact over a relatively long period of time. Finally, the fourth source of rating data error, faulty item construction, can be avoided through precise item wording, attention to item relevance and objectivity, extensive pilot testing, and item revision guided by item analysis information.

Because the sources of error can be minimized and because the peer rating approach has advantages that other techniques cannot offer, it was concluded that the best approach to assessment of personal-social behavior would be by means of a peer rating scale. Efforts were undertaken to develop and validate a peer rating scale that 1) overcomes the weaknesses of the sociometric method and 2) reliably and validly assesses classroom socialization.

The format chosen for the peer rating instrument was direct questioning concerning various observable social behaviors to which the respondent replied "yes," "no," or "sometimes wit reference to a specified classmate. Each child rated three classmates successively during the administration of the socialization measure. Ratees were assigned to raters by a computer-generated randomization system. The name of the child being rated was printed at the top of each one-page answer sheet. Thus each class member rated three others and was, in turn, rated by three other classmates. Scores were computed on a three-point scale with the socially most desirable behavior assigned a value of 3.

Four preliminary editions of the Peer Rating Scale led to a 60-item form organized around three major scales comprised of four constructs each. The organization of construct variables was as follows:

Individual Prosocial Action	Social Interaction	Affective Relationships
Leadership	Cooperation	Liking Others
Independence	Conformity	Social Acceptance
Assertiveness	Authority Relations	Being Liked
Competitiveness	Control of Aggression	Popularity

The logical and empirical background for these scale variables and construct variables was discussed in the introductory remarks concerning socialization.

The socialization measure included five items for each of 12 constructs. However, to include this many items a time constraint had to be overcome. A solution to this time constraint was attained through use of a modified-item sampling strategy. Using the modified item sampling plan, each pupil rated three other classmates, but each classmate was rated on 20 different items. Construct representation was balanced across each of the 20 items. The unit of analysis was the mean of ratings on five <u>different items</u>, each representing the <u>same construct</u>. This modified item sampling procedure has the advantages of allowing more items per construct in the same amount of testing time as well as eliminating memory effects resulting from successive administration of the same items.

On the basis of examiners' reports of respondent fatigue in preliminary administration at grades 1 and 2, it was decided to reduce total length of the grade 1 and 2 form to 36 items. This was done by using the item-analysis results from preliminary administration in grades 1 and 2 to choose the three best items per construct.

Students from five inner-city public elementary schools in Indianapolis, Indiana served as subjects. The 36-item form was administered orally to seven first grade classes which provided a sample of 90 boys and 100 girls. The 60-item form was administered orally to seven fourth grade classes, which yielded a group of 108 boys and 102 girls. Administration times varied from 30 to 40 minutes for the first grade classes and from 22 to 32 minutes for the fourth grade classes. First graders required extensive help in reading the names of the classmates they were to rate and this necessitated increased testing time.

Some problems encountered in administering the Peer Rating Scale as reported by the examiners included discipline problems in some classrooms, and inconvenient seating arrangements conducive to information exchange between respondents. No problems were encountered in the vocabulary used in the items.

The descriptive statistics for the Indianapolis testing are presented in Tables 11 and 12. Construct, scale, and total scores were computed for each pupil. No major systematic trends are evident in examining differences between construct means across grade levels, but girls seem to consistently receive higher mean ratings than boys on all constructs, regardless of grade level. No consistent differences between construct standard deviations are evident with regard to ratee sex, but the first grade construct data appear to have higher variability than the data for the fourth grade.

The reliability estimates for the Indianapolis data, shown in Table 13, reveal better interjudge agreement as estimated by Kendall W and higher internal consistency as estimated by intra-class correlation r_1 for the boys as compared with girls across grades, and for the fourth graders as opposed to first graders across ratee sex. The latter results are expected since the first graders received the shortened form of the instrument.

As a check on possible sex bias in the ratings, analyses were run to compare all combinations of boys rating boys; boys rating girls, girls rating boys, and girls rating girls. Kendall Ws were calculated for all combinations. These correlations ranged from .43 to .55 at the first grade level and reveal no substantial differences between rater reliability due to sex of rater and ratee. At the fourth grade level the correlations range from .52 to .74. Girls seem to be more reliable than boys in rating boys but all the other combinations are quite similar.

Tables 14, 15, 16 and 17 show the Indianapolis item analyses. The summary statistic p is an evaluation of the distribution of responses across the three response levels for each item. The specific proportions are given in Tables 15 and 17. The item correlation, r_1, is for the item score with the construct score of which it is a part. For nearly all items at grade one, the distribution of responses receives the high rating of 3. The item correlations are also predominantly high ranging from about .55 to .70. All items appear satisfactory.

Item analyses at the fourth grade level show that there are two questionable items, 24 and 32, and two weaker items, 27 and 43. However, although all four have limitations in the distribution of responses, all four have satisfactory item-construct correlations. The items were inspected for verbal deficiencies and nothing was found to be wrong. Thus, all four items were retained in the scale.

Table 11

Descriptive Statistics (Grade 1)
Peer Rating Scale

	Boys N=90		Girls N=100		Both Sexes N=190	
	Mean	SD	Mean	SD	Mean	SD
1. Leadership	2.14	.53	2.16	.47	2.15	.50
2. Independence	2.04	.57	2.12	.55	2.08	.56
3. Assertiveness	2.13	.54	2.14	.55	2.13	.55
4. Competitiveness	2.31	.55	2.36	.51	2.34	.53
5. Cooperation	2.14	.60	2.28	.52	2.21	.56
6. Conformity	2.12	.62	2.20	.57	2.16	.59
7. Authority Relations	2.13	.58	2.28	.56	2.21	.58
8. Aggression Control	2.07	.62	2.19	.59	2.13	.61
9. Liking Others	2.25	.55	2.37	.50	2.31	.53
10. Social Acceptance	2.13	.55	2.18	.57	2.16	.56
11. Being Liked	2.18	.58	2.26	.50	2.22	.54
12. Popularity	2.23	.61	2.33	.57	2.28	.59
A. Individual Action	2.16	.33	2.19	.30	2.17	.31
B. Social Interaction	2.11	.39	2.23	.36	2.18	.38
C. Affective Relationships	2.19	.35	2.29	.34	2.24	.35
T. Total Score	2.15	.28	2.24	.24	2.20	.26

Table 12

Descriptive Statistics (Grade 4)
Peer Rating Scale

	Boys N=108		Girls N=100		Both Sexes N=208	
	Mean	SD	Mean	SD	Mean	SD
1. Leadership	1.93	.49	1.95	.47	1.94	.48
2. Independence	2.14	.50	2.26	.51	2.20	.51
3. Assertiveness	2.09	.50	2.14	.45	2.11	.48
4. Competitiveness	2.42	.45	2.36	.44	2.39	.44
5. Cooperation	2.23	.49	2.30	.50	2.26	.50
6. Conformity	2.12	.42	2.22	.41	2.17	.42
7. Authority Relations	2.05	.56	2.30	.56	2.17	.57
8. Aggression Control	1.89	.54	1.99	.53	1.94	.54
9. Liking Others	2.37	.42	2.46	.34	2.41	.39
10. Social Acceptance	2.37	.48	2.45	.47	2.41	.48
11. Being Liked	2.27	.47	2.38	.47	2.32	.47
12. Popularity	2.09	.44	2.08	.41	2.09	.43
A. Individual Action	2.15	.36	2.18	.34	2.16	.35
B. Social Interaction	2.07	.41	2.20	.38	2.13	.40
C. Affective Relationships	2.27	.36	2.34	.35	2.31	.36
T. Total Score	2.16	.33	2.24	.31	2.20	.33

Table 13

Reliability Statistics
Peer Rating Scale

Grade	Sex	N	Interjudge Agreement (Kendall W)				Internal Consistency (Intraclass Correlation, ri)			
			Scales			Total	Scales			Total
			A	B	C		A	B	C	
1	Boys	90	.26	.36	.32	.38	.32	.54	.40	.69
	Girls	100	.27	.35	.30	.34	.17	.34	.41	.59
	Both	190	.27	.36	.31	.36	.24	.48	.41	.65
4	Boys	108	.50	.45	.42	.48	.73	.79	.75	.90
	Girls	100	.41	.41	.39	.42	.67	.75	.73	.88
	Both	208	.45	.43	.40	.45	.71	.78	.74	.89

Table 14

Item Analysis* (Grade 1)
Peer Rating Scale

Item	Boys N=90 p	Boys N=90 r	Girls N=100 p	Girls N=100 r	Both Sexes N=190 p	Both Sexes N=190 r	Item	Boys N=90 p	Boys N=90 r	Girls N=100 p	Girls N=100 r	Both Sexes N=190 p	Both Sexes N=190 r
1	3	59	3	50	3	54	19	2	67	3	64	3	66
2	3	69	3	64	3	66	20	2	63	3	58	3	61
3	3	56	3	53	3	54	21	3	71	3	65	3	68
4	3	62	3	56	3	59	22	3	63	3	66	3	65
5	3	70	3	52	3	62	23	3	62	3	68	3	64
6	3	67	3	58	3	63	24	3	59	3	67	3	63
7	3	55	3	62	3	59	25	3	57	3	63	3	61
8	3	59	3	62	3	60	26	3	67	3	50	3	59
9	3	58	3	61	3	60	27	3	66	3	54	3	59
10	3	57	3	64	3	60	28	3	70	3	55	3	63
11	3	67	3	52	3	59	29	3	64	3	60	3	62
12	3	56	3	65	3	61	30	3	56	3	64	3	61
13	3	70	3	62	3	67	31	3	67	3	71	3	69
14	3	59	3	55	3	57	32	3	65	3	60	3	62
15	3	65	3	57	3	62	33	3	52	3	61	3	57
16	3	69	3	69	3	69	34	3	69	3	54	3	60
17	2	59	2	57	2	58	35	3	73	3	68	3	71
18	3	55	3	60	3	57	36	3	66	3	52	3	58

*Column p shows, for each item, the relative dispersion of responses among the 3 alternatives. It contains an index number designating the number of alternatives attracting at least 10% of the respondents.

Column r shows the product-moment correlation between the item score and the construct score.

Table 15

Response Proportions (Grade 1)
Peer Rating Scale

Item	Boys (N=90) Yes	Sometimes	No	Girls (N=100) Yes	Sometimes	No	Both Sexes (N=190) Yes	Sometimes	No
1	43	31	17	54	17	16	49	24	16
2	38	29	23	42	16	29	40	22	26
3	58	13	19	52	13	22	55	13	20
4	39	14	36	42	12	33	40	13	34
5	46	20	24	51	17	19	48	18	22
6	47	20	22	57	11	19	52	15	20
7	50	13	28	36	16	35	43	15	32
8	43	24	22	52	12	23	48	18	23
9	49	17	24	56	11	18	53	14	21
10	53	18	19	61	11	15	57	14	17
11	39	23	29	42	11	34	40	17	32
12	43	27	20	49	10	27	46	18	24
13	33	23	32	42	23	21	38	23	26
14	36	26	26	27	26	32	31	26	29
15	38	12	38	41	19	24	40	16	30
16	26	14	49	27	13	43	26	14	46
17	46	09	32	42	09	34	44	09	33
18	39	23	26	33	25	26	36	24	26
19	43	09	37	47	14	24	45	12	30
20	48	09	32	47	15	24	47	12	28
21	41	19	28	43	24	18	42	22	23
22	29	13	44	43	11	31	36	12	37
23	50	11	28	39	20	25	44	16	26
24	36	18	36	47	17	21	42	17	28
25	46	11	23	60	13	18	53	12	20
26	47	10	23	55	17	18	51	14	20
27	32	18	28	43	11	37	38	14	33
28	38	16	28	49	18	24	44	17	26
29	47	18	17	53	15	21	50	16	19
30	29	12	38	41	18	31	35	15	34
31	44	13	22	52	11	28	48	12	25
32	32	24	23	45	18	28	39	21	26
33	29	20	29	40	23	27	35	22	28
34	34	18	27	36	21	31	35	20	29
35	41	14	24	53	13	24	47	14	24
36	43	19	16	49	23	17	46	21	16
Overall Proportions	41	18	27	46	16	25	44	17	26

Note. Proportions for each item do not sum to unity due to respondent omissions.

Table 16

Item Analysis* (Grade 4)
Peer Rating Scale

Item	Boys N=108 p	Boys N=108 r	Girls N=100 p	Girls N=100 r	Both Sexes N=208 p	Both Sexes N=208 r	Item	Boys N=108 p	Boys N=108 r	Girls N=100 p	Girls N=100 r	Both sexes N=208 p	Both sexes N=208 r
1	3	42	3	31	3	37	31	3	57	3	60	3	57
2	3	55	3	64	3	60	32	2	61	1	40	2	55
3	3	56	3	52	3	55	33	3	42	3	36	3	40
4	3	46	3	61	3	53	34	3	54	3	50	3	52
5	3	53	3	51	3	54	35	3	67	3	46	3	57
6	3	60	3	51	3	56	36	3	67	3	58	3	63
7	3	59	3	53	3	56	37	3	51	3	47	3	52
8	3	44	3	52	3	48	38	3	67	3	61	3	63
9	3	49	3	54	3	51	39	3	49	3	62	3	55
10	3	47	3	48	3	47	40	3	67	3	46	3	57
11	3	52	3	49	3	51	41	3	70	3	64	3	67
12	3	44	3	54	3	49	42	3	70	3	70	3	70
13	3	51	3	61	3	56	43	3	53	2	45	2	48
14	3	56	3	39	3	43	44	3	61	3	55	3	58
15	2	24	3	31	2	25	45	3	56	3	48	3	52
16	3	54	3	63	3	58	46	3	43	3	42	3	42
17	3	67	3	65	3	68	47	3	67	3	64	3	66
18	3	63	3	54	3	59	48	3	60	3	53	3	56
19	3	73	3	75	3	75	49	3	66	3	69	3	68
20	3	54	3	57	3	55	50	3	72	3	68	3	70
21	3	60	3	48	3	55	51	3	56	3	66	3	60
22	3	44	3	35	3	40	52	3	62	3	72	3	66
23	3	58	3	57	3	58	53	3	66	3	59	3	62
24	3	49	1	48	1	47	54	3	52	3	57	3	54
25	3	66	2	66	3	66	55	3	60	3	65	3	62
26	3	62	3	46	3	55	56	3	63	3	64	3	64
27	2	63	3	63	2	63	57	3	73	3	60	3	67
28	3	71	3	64	3	68	58	3	62	3	63	3	63
29	3	51	3	56	3	53	59	3	62	3	52	3	58
30	3	57	3	44	3	51	60	3	63	3	70	3	64

*Column p shows, for each item, the relative dispersion of responses among the 3 alternatives. It contains an index number designating the number of alternatives attracting at least 10% of the respondents.

Column r shows the product-moment correlation between the item score and the construct score.

Table 17

Response Proportions (Grade 4)
Peer Rating Scale

Item	Boys (N=108) Yes	Sometimes	No	Girls (N=100) Yes	Sometimes	No	Both Sexes (N=208) Yes	Sometimes	No
1	18	39	36	15	42	39	17	40	38
2	42	18	32	49	16	31	45	17	32
3	19	25	48	44	18	34	31	22	41
4	33	27	33	44	22	30	38	24	32
5	39	23	32	60	16	19	49	20	26
6	44	27	23	56	16	24	50	22	24
7	57	20	14	58	21	16	58	21	15
8	46	20	26	56	16	24	51	18	25
9	16	14	62	14	21	61	15	17	62
10	37	20	36	47	14	34	42	17	35
11	25	14	53	36	12	48	30	13	50
12	26	35	32	36	24	36	31	30	34
13	44	22	27	55	18	22	49	20	24
14	2[illegible]	37	32	35	27	33	30	32	32
15	76	11	06	73	13	09	74	12	07
16	39	26	28	47	22	26	43	24	27
17	31	23	40	56	17	22	43	20	31
18	51	22	19	60	20	16	55	21	18
19	25	30	39	46	21	29	35	26	34
20	12	36	45	18	42	35	15	29	40
21	3[illegible]	11	52	32	14	46	33	12	49
22	37	22	37	40	25	28	38	24	33
23	56	19	20	64	10	19	60	15	20
24	74	10	12	76	08	07	75	09	10
25	31	14	52	35	09	48	33	12	50
26	65	15	17	70	11	12	67	13	14
27	72	07	17	63	10	16	68	09	16
28	44	22	30	53	21	19	49	22	24
29	56	22	18	60	16	17	58	19	18
30	52	18	25	55	16	22	53	17	24
31	67	14	16	57	17	19	62	15	17
32	69	09	18	80	06	07	74	08	12
33	43	22	32	45	25	23	44	24	27
34	25	12	58	30	12	51	27	12	55
35	55	13	28	56	10	27	55	12	27
36	35	22	39	40	18	35	38	20	37
37	47	19	30	62	14	15	54	17	23
38	58	27	11	51	21	21	55	24	16
39	18	18	61	19	19	55	18	18	58
40	54	26	17	58	16	19	56	21	18
41	63	16	18	60	11	22	61	14	20
42	43	22	32	48	22	23	45	22	27
43	68	10	18	64	09	19	66	10	18
44	33	24	38	34	25	34	34	24	36
45	46	21	30	47	22	24	47	22	27
46	56	24	18	58	15	20	57	20	19
47	48	18	32	54	15	23	51	16	27
48	52	24	20	47	25	20	50	24	20
49	40	27	31	53	18	22	46	23	26
50	47	18	31	46	19	27	47	18	29
51	59	13	25	56	10	26	58	12	26
52	64	17	16	64	15	13	64	16	14
53	74	11	12	59	15	19	67	13	15
54	47	29	21	52	17	23	50	23	22
55	61	21	14	60	17	16	61	19	15
56	35	16	46	34	21	38	35	18	42
57	42	11	44	45	18	30	43	14	37
58	59	20	17	61	12	19	60	16	18
59	49	20	27	39	23	31	44	22	29
60	45	25	27	45	18	29	45	22	28
Overall Proportions	45	20	30	50	18	26	47	19	28

Note. Proportions do not sum to unity due to respondent omissions.

Table 18 presents the correlations among the construct, scale and total scores. It is apparent that the correlations among constructs of different scales are generally very low, that constructs are highly correlated with other constructs in the same scale, and that constructs are highly correlated with their respective total scale scores. The correlations among scales are moderately high. These correlations, while almost always significant, indicate nevertheless that there is sufficient orthogonality to warrant a factor analysis. Thus, these matrices served as the basis for the factor ana[illegible] to be reported next.

Table 19 presents factor analyses for the Indianapolis construct score data. The constructs with largest loadings for each factor are in parentheses. The ratings of male and female first graders combined result in a factor structure which shows some deviation from the hypothesized organization of constructs. However, the factor loadings display the formation of the Social Interaction and Affective Relationships scales by most of the appropriate constructs. At the fourth grade level, the combined data of boys and girls yields a factor structure in which all three hypothesized scales are well defined. Differences between the factor structures generated by ratings of boys and girls at the first grade level may be summarized by stating that the more definitive support for the hypothesized organization of constructs exhibited by the girls' ratings is chiefly due to a more clearcut formation of the Affective Relationships scale. Factor structure differences due to the sex of the fourth-graders show that boys are rated so as to more closely approximate the hypothesized structure especially for the Social Interaction scale.

The possibility of a developmental change toward a more logical organization of socialization constructs finds support in these data. The differences between sexes shown in the factor structures of the Indianapolis data imply differences in the conceptual framework utilized by children for the evaluation of their peers' social behavior. These differences are dependent upon the sex of the child being rated.

Tables 20 and 21 present correlations between the peer rating scores and other measures from the Indianapolis testing. The teacher assessments of pupils' personal-social characteristics by means of the Pupil Information Book (PIB) are theoretically most closely related to the peer rating subscales. While PIB items were designed to measure behavior similar to that measured by the Peer Rating Scale, no attempt was made to develop instruments with item-to-item correspondence. The PIB measures a pupil's behavior as seen by the teacher, whereas the peer rating procedure yields estimates of the pupil's characteristics as viewed by classmates. Since the teacher responded to the PIB only for selected children in his or her class, the correlations between PIB items and the peer ratings are based on relatively few cases. The correlations reported separately for boys and girls are computed on 8 to 13 cases, while correlations for

Table 18

Subscale Correlations*
Peer Rating Scale

	1	2	3	4	5	6	7	8	9	10	11	12	A	B	C	T
1. Leadership	--	50	38	46	50	44	48	47	47	51	43	39	78	58	57	72
	--	46	34	44	49	29	38	48	39	42	55	44	78	55	55	70
	--	48	36	45	49	37	42	47	43	47	49	41	78	56	56	71
2. Independence	33	--	41	44	36	50	51	44	29	51	47	43	79	56	54	71
	17	--	37	39	55	17	54	44	47	35	35	33	78	58	45	68
	25	--	39	40	45	35	53	45	37	44	42	38	78	57	50	70
3. Assertiveness	17	11	--	37	28	23	30	30	12	28	16	18	71	36	25	50
	08	07	--	17	34	06	40	33	28	24	30	30	65	39	34	52
	13	09	--	27	31	16	35	32	19	27	23	23	69	37	29	52
4. Competitiveness	05	00	33	--	41	42	47	39	42	53	50	38	73	53	58	69
	19	06	06	--	47	28	38	39	30	41	49	41	67	51	50	62
	12	02	19	--	43	35	41	38	36	46	48	39	70	50	53	65
5. Cooperation	02	12	15	40	--	55	51	45	55	55	52	47	52	76	66	74
	23	04	14	07	--	14	53	47	44	42	43	50	64	73	54	72
	12	09	15	25	--	36	52	46	50	49	48	48	57	75	60	73
6. Conformity	16	05	17	17	38	--	67	55	45	48	46	44	53	83	57	74
	19	04	11	24	38	--	37	49	16	30	30	15	28	62	29	46
	17	05	14	21	38	--	54	53	34	40	40	30	42	74	45	62
7. Authority Relations	-12	14	03	31	43	23	--	54	47	46	50	40	58	85	57	76
	09	36	23	13	24	07	--	56	48	48	51	54	61	83	60	77
	-01	26	14	22	35	16	--	55	48	47	51	45	59	84	59	77
8. Aggression Control	26	20	07	-20	10	15	13	--	43	35	44	37	53	79	50	70
	17	09	00	06	31	23	14	--	38	42	53	39	58	84	53	74
	22	15	03	-07	21	20	15	--	42	39	49	37	55	81	52	72
9. Liking Others	16	11	16	48	14	16	15	01	--	45	46	46	43	58	73	65
	16	-05	11	02	21	00	-01	12	--	51	55	48	51	50	73	66
	16	04	14	26	18	09	08	08	--	48	50	46	46	56	73	66
10. Social Acceptance	08	37	15	27	28	24	08	-03	15	--	63	52	61	56	83	75
	05	00	01	22	06	-06	21	-04	08	--	68	59	50	54	86	71
	07	18	08	25	18	09	15	-03	12		65	55	56	56	85	73
11. Being Liked	10	05	29	24	27	12	27	21	15	-05	--	53	52	59	83	73
	13	08	16	13	21	13	25	15	25	16	--	64	58	59	89	78
	12	07	23	21	25	13	23	19	19	06	--	57	55	60	86	75
12. Popularity	12	08	13	25	26	25	34	08	35	17	16	--	46	51	78	65
	32	08	16	13	19	25	18	16	32	17	27	--	51	53	82	70
	22	08	15	20	24	25	27	13	34	17	22	--	48	51	79	67
A. Individual Action	63	60	65	57	29	22	16	14	37	28	24	35	--	67	64	87
	59	59	55	55	20	24	37	13	09	24	29	13	--	71	64	88
	61	59	60	56	25	23	26	14	24	27	27	24	--	69	64	87
B. Social Interaction	13	20	17	25	72	68	67	54	17	32	35	21	31	--	71	91
	26	20	18	18	72	64	56	66	12	28	30	06	36	--	66	90
	19	21	17	22	73	66	62	61	16	31	34	14	34	--	69	91
C. Affective Relationships	19	34	30	50	40	31	34	13	67	54	71	49	50	45	--	88
	27	[illegible]	18	22	26	13	24	14	63	[illegible]	71	55	29	29	--	87
	23	15	23	36	34	23	30	15	66	59	71	52	40	39	--	87
T. Total Score	39	43	46	55	62	53	52	36	50	48	55	44	75	78	82	--
	49	35	40	41	56	48	53	44	38	53	59	34	71	77	72	--
	43	40	42	48	60	51	53	41	46	51	57	39	73	78	78	--

*Grade 1 correlations are below the diagonal and grade 4 correlations are above the diagonal. Each entry consists of three correlations. From top to bottom they represent boys, girls, and both sexes. First grade data were computed for 90 boys and 100 girls for a total of 190 pupils. Fourth grade data were computed for 108 boys and 100 girls for a total of 208 pupils. Significant values at the .05 level are .20 for either sex and .14 for both sexes combined.

Table 19

Factor Analyses
Peer Rating Scale

	Grade 1 Data												Grade 4 Data								
	Boys (N=90)				Girls (N=100)				Both Sexes (N=190)				Boys (N=108)			Girls (N=100)			Both Sexes (N=208)		
Factor Number	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	1	2	3	1	2	3
Eigenvalue	2.96	1.55	1.29	1.20	2.67	1.32	1.18	1.13	2.83	1.25	1.12	1.10	5.87	1.08	0.85	5.55	1.12	1.01	5.70	1.00	0.90
Percent of Variance	24.7	12.9	10.8	10.0	22.2	11.0	9.8	9.4	23.6	10.4	9.4	9.2	48.9	9.0	7.1	46.3	9.3	8.4	47.5	8.3	7.5
1. Leadership	-.15	.27	(.52)	.24	.24	(.30)	.10	.17	.33	-.13	(.42)	.26	.41	.36	(.44)	(.45)	.40	.28	.42	.28	(.47)
2. Independence	.07	.05	.34	(.50)	-.03	.06	(.44)	.04	.02	.10	.16	(.63)	.34	.31	(.56)	(.74)	.18	.15	.32	.31	(.55)
3. Assertiveness	.09	(.42)	.16	.06	.17	.09	(.22)	.06	(.29)	.14	.04	.08	.08	.13	(.63)	(.46)	.19	.06	.13	.11	(.58)
4. Competitiveness	.32	(.77)	-.29	.09	-.03	.27	.03	(.53)	(.53)	.22	-.18	.07	(.46)	.27	.41	.34	(.38)	.27	(.45)	.25	.33
5. Cooperation	(.65)	.20	.01	.16	.30	(.48)	.21	.00	.32	(.55)	.13	.01	(.53)	.46	.18	(.65)	.35	.12	(.50)	.30	.39
6. Conformity	(.38)	.16	.14	.17	.00	(.65)	.01	.16	.29	(.31)	.19	-.02	.33	(.68)	.24	.06	.13	(.73)	.25	(.68)	.12
7. Authority Relations	(.68)	.08	.00	-.01	.08	.12	(.77)	.13	.11	(.61)	.01	.27	.31	(.66)	.32	(.56)	.37	.34	.37	(.57)	.37
8. Aggression Control	.19	-.09	(.61)	-.02	.18	(.35)	.14	-.05	.00	.23	(.54)	.06	.25	(.59)	.31	.44	.29	(.59)	.29	(.60)	.34
9. Liking Others	.14	(.52)	.02	.11	(.67)	.09	-.09	-.04	(.50)	.04	.11	.00	(.52)	.46	.04	.43	(.50)	.09	(.53)	.31	.21
10. Social Acceptance	.19	.15	-.08	(.67)	.16	-.09	.13	(.40)	(.27)	.14	-.14	.26	(.73)	.18	.33	.24	(.70)	.23	(.71)	.23	.23
11. Being Liked	.30	(.31)	.29	-.20	(.36)	.13	.19	.24	(.29)	.28	.17	.02	(.67)	.31	.19	.24	(.80)	.28	(.73)	.31	.17
12. Popularity	(.37)	.28	.09	.10	(.40)	.23	.11	.26	(.46)	.21	.16	.08	(.73)	.29	.16	.34	(.70)	.07	(.65)	.19	.21

Table 20

Correlations Between Peer Ratings and Selected Variables* (Grade 1)

	Ravens	Reading Achievement	Math Achievement	Attitude toward School	Self Concept	Teacher's estimate of Leadership	Teacher's estimate of Independence	Teacher's estimate of Assertiveness	Teacher's estimate of Competitiveness	Individual Action Subscale	Teacher's estimate of Cooperativeness	Teacher's estimate of Conformity	Teacher's estimate of Authority Relations	Teacher's estimate of Aggression Control	Social Interaction Subscale	Teacher's estimate of Liking Others	Teacher's estimate of Being Liked	Affective Relationship Subscale	Total for Teacher's estimate	Learning Environment	Parent's Activities	Futility	Parental Conservatism	Parental Acceptance	Parental Permissiveness
1. Leadership	-13	01	-02	-03	-08	-50	-10	-78	-54	-70	07	06	06	27	14	-28	-48	-52	-27	-34	-07	-10	-11	-10	-13
	11	-08	04	-01	08	35	57	52	39	50	61	-26	44	46	51	55	64	61	58	04	11	-08	-13	-18	-11
	-01	-03	02	-02	01	-03	24	-22	-03	01	38	06	27	20	35	20	24	24	25	-15	05	-10	-08	-16	-14
2. Independence	06	12	15	04	-04	14	-25	-49	-18	-28	14	12	22	-02	15	-08	01	-06	-03	09	-01	11	10	23	14
	10	-12	04	02	06	-12	-07	-09	-18	-12	00	32	-14	08	06	-05	-05	-05	-07	-04	-11	08	03	-15	-20
	09	01	11	04	02	01	-17	-31	-17	-17	07	17	12	-01	10	-06	-02	-04	-04	04	-04	06	03	-04	-09
3. Assertiveness	11	25	19	04	07	05	32	-02	12	20	-08	-29	14	21	08	-46	-19	-47	06	-20	01	-04	18	-05	-02
	-08	18	10	05	04	35	-06	09	02	15	-31	-36	-41	-50	-56	-40	-31	-35	-12	05	02	00	-05	-16	-08
	02	20	14	04	06	19	12	05	04	15	-21	-35	-05	00	-13	-43	-25	-36	-08	-07	01	-01	06	-09	-03
4. Competitiveness	-02	01	05	-03	01	12	-29	-25	-40	-28	23	17	-22	11	01	47	-35	14	-07	-18	04	09	-05	-08	04
	-14	-07	-10	-10	00	07	51	57	60	42	67	24	49	30	69	70	54	62	57	-25	-18	05	-02	16	14
	-07	-03	-03	-07	00	08	14	26	18	19	21	10	-12	-02	01	54	24	41	21	-21	-08	07	-03	07	10
5. Cooperation	08	-01	05	-04	21	-04	02	-09	-35	-13	40	19	-08	42	22	60	-44	17	15	-06	13	29	32	-01	23
	07	07	15	01	-01	-18	08	-19	-13	-11	-09	73	-01	66	34	-10	-10	-11	-03	14	-02	-08	-01	-04	10
	08	06	11	-01	13	-10	01	-09	-26	-12	08	26	-17	23	05	18	-25	-05	-03	05	06	09	13	-03	13
6. Conformity	12	13	20	-17	30	06	05	-10	04	92	51	65	12	30	35	59	-06	41	33	-07	13	18	43	-11	06
	09	04	00	-07	14	31	25	18	18	27	08	-28	-07	11	-06	04	15	10	18	03	02	20	14	-01	-05
	11	09	10	-11	23	14	17	-06	15	13	52	46	27	42	44	37	12	26	37	-02	07	18	27	-04	00
7. Authority Relations	01	01	-04	-08	00	-24	-22	14	-10	-19	-25	-32	-15	-22	-24	-05	-40	-29	-26	17	13	-02	-06	16	34
	06	-10	07	-07	03	-44	-20	-32	-32	-37	-08	71	01	30	26	-15	-23	-20	-22	11	05	12	-01	05	07
	04	-02	03	-06	03	-35	-20	-10	-21	-29	-14	13	-08	08	-08	-10	-26	-20	-21	14	10	02	-06	03	11
8. Aggression Control	25	11	15	-01	22	-06	45	-37	19	11	25	23	18	47	32	-15	-32	-32	24	1[illegible]	09	07	-14	13	22
	16	-08	06	-10	-12	34	37	21	37	36	22	-31	23	02	12	11	-22	17	29	2[illegible]	14	12	04	15	28
	22	04	11	-05	05	16	43	-13	31	25	34	11	28	43	36	05	08	07	34	24	12	08	-05	12	22
9. Liking Others	37	28	30	10	18	35	07	-55	04	00	59	52	44	54	59	08	03	08	42	16	24	25	01	05	03
	07	14	04	01	08	86	65	30	54	71	13	-15	56	16	31	23	52	40	59	-25	-16	-34	-04	-30	00
	24	21	16	06	11	71	44	-01	38	52	29	15	34	29	33	19	41	33	50	-06	02	-07	-02	-16	00
10. Social Acceptance	-05	-01	-01	07	10	41	46	06	33	52	81	42	78	51	78	58	63	84	87	-08	-25	05	34	05	-16
	-06	-02	04	-04	09	-53	-62	-42	-60	-60	-19	45	-13	-40	-09	-07	-19	-14	-42	-05	-21	06	09	-06	01
	-05	00	02	02	10	-10	-07	-11	-15	-13	25	30	34	15	30	17	06	12	12	-06	-22	03	17	-05	-08
11. Being Liked	20	14	-04	06	-04	03	-45	06	-19	-23	-29	-31	-03	-13	-16	-39	-15	-39	-26	-07	08	-35	-23	-11	32
	12	16	27	-09	-11	14	08	-14	09	06	-23	25	04	-01	-01	-30	-23	-27	-03	16	19	-07	00	-05	04
	17	16	13	-02	-02	08	-16	-07	-01	-04	-09	00	10	04	03	-27	-13	-21	-04	06	14	-20	-11	-10	11
12. Popularity	20	-07	03	18	35	12	24	-15	19	17	49	31	72	42	63	01	45	29	53	-25	-06	20	05	-16	11
	03	13	11	-04	-09	48	35	17	21	38	20	00	52	00	34	27	46	38	40	11	06	-07	-05	-01	01
	12	06	08	06	12	26	32	-07	24	26	53	32	72	48	64	20	44	36	54	-06	00	04	-01	-07	03
A. Individual Action	02	15	15	01	-01	-07	-17	-71	-44	-49	15	02	13	22	17	-21	-39	-41	-14	-25	-02	03	04	02	04
	00	-02	06	-01	08	29	49	56	43	47	54	04	24	22	43	46	45	46	51	-10	-07	03	-02	-13	-10
	02	07	11	00	04	11	12	-14	-03	05	21	02	11	16	15	11	10	11	14	-17	-04	02	-01	-09	-06
B. Social Interaction	18	09	14	-11	29	-10	11	-18	-06	-08	34	31	03	35	24	35	-43	-01	17	10	18	19	20	07	32
	15	-04	11	-09	02	-01	18	-06	03	04	06	35	09	40	27	-04	01	-02	08	23	08	14	05	07	17
	17	07	13	-09	17	-05	17	-15	02	00	32	37	15	39	32	19	-10	04	20	16	13	14	10	03	19
C. Affective Relationships	32	12	11	17	24	30	01	-20	04	07	50	27	67	50	63	-02	30	17	48	-12	03	06	06	-09	19
	05	17	16	-04	03	47	27	00	18	30	-04	19	42	-06	23	03	23	15	27	-06	-08	-19	-01	-15	03
	19	17	15	06	13	36	17	-14	15	20	38	31	60	43	54	06	27	19	42	-08	-03	-10	-01	-16	04
T. Total Score	23	15	17	02	23	05	01	-45	-16	-18	44	28	35	47	46	09	-24	-08	24	10	10	14	15	01	26
	10	04	15	-07	06	30	36	17	24	31	19	25	30	22	36	15	26	21	33	04	-03	-01	01	-10	06
	18	13	1[illegible]	-02	15	18	20	-19	07	11	40	32	37	43	44	16	10	14	33	-02	04	04	05	-09	09

*Each entry consists of three correlations. From top to bottom they represent boys, girls, and both sexes.

Table 21

Correlations Between Peer Ratings and Selected Variables* (Grade 4)

	Ravens	Reading Achievement	Math Achievement	Attitude toward School	Self Concept	Teacher's estimate of Leadership	Teacher's estimate of Independence	Teacher's estimate of Assertiveness	Teacher's estimate of Competitiveness	Individual Action Subscale	Teacher's estimate of Cooperativeness	Teacher's estimate of Conformity	Teacher's estimate of Authority Relations	Teacher's estimate of Aggression Control	Social Interaction Subscale	Teacher's estimate of Liking Others	Teacher's estimate of Being Liked	Affective Relationship Subscale	Total for Teacher's estimate	Learning Environment	Parent's Activities	Futility	Parental Conservatism	Parental Acceptance	Parental Permissiveness	Sociometric Nomination
1. Leadership	27	28	28	02	15	-05	39	-26	11	12	30	-45	21	15	21	-24	23	02	16	12	13	16	17	13	03	29
	01	15	15	01	01	93	11	87	68	82	71	01	51	28	62	40	45	70	82	26	14	26	09	24	48	26
	12	22	23	02	07	27	35	13	35	38	49	-18	35	23	47	12	37	32	40	19	14	21	13	18	21	23
2. Independence	09	36	37	32	19	36	43	-02	-26	31	41	34	35	36	43	-17	32	13	37	16	35	15	31	25	14	23
	19	25	31	11	-02	46	35	10	27	45	-10	-20	-28	-16	-26	-33	06	-27	04	21	20	15	25	24	33	16
	13	33	35	23	07	42	42	07	02	39	27	17	24	27	29	-13	28	10	31	19	27	15	28	25	22	20
3. Assertiveness	00	26	28	11	15	03	60	-21	23	30	50	-02	31	33	38	-23	39	14	36	08	11	-09	08	00	19	10
	19	25	25	13	00	38	81	19	31	71	49	61	45	-32	48	-31	48	06	55	23	21	13	-03	31	23	21
	09	26	27	12	07	17	68	-04	29	45	49	24	36	24	42	-15	44	18	43	15	15	01	05	15	21	15
4. Competitiveness	17	28	30	12	27	13	74	-31	14	36	67	33	74	61	76	-28	56	24	62	36	33	15	14	37	20	27
	16	17	16	14	07	-04	-07	-35	-14	-19	-26	13	09	48	09	17	-63	-31	-14	13	20	21	15	22	16	11
	17	21	23	12	17	13	52	-24	12	26	43	31	64	60	65	-01	30	19	47	25	27	18	14	30	18	19
5. Cooperation	28	38	42	12	17	06	66	-37	28	30	59	-05	70	50	67	-55	52	03	52	38	39	35	27	38	08	27
	23	31	35	02	-02	24	57	08	00	48	31	33	-04	-19	14	-69	53	-26	22	33	18	18	05	41	09	06
	24	35	40	08	07	16	67	-15	22	40	50	16	54	38	55	-44	54	06	45	35	28	26	16	39	08	18
6. Conformity	14	34	32	08	15	18	60	-49	29	28	64	34	86	59	81	-38	59	19	62	24	26	16	05	29	15	06
	12	16	16	19	-01	18	31	-06	27	28	13	57	24	-66	13	11	-02	09	22	13	11	17	07	19	36	09
	10	28	26	16	05	23	54	-27	34	34	52	45	76	43	70	-06	47	27	56	18	18	16	07	24	25	08
7. Authority Relations	23	48	44	20	25	11	66	-49	11	25	58	27	84	73	83	-59	58	05	60	25	17	10	07	11	06	06
	33	38	41	31	06	-07	76	-17	05	35	34	77	60	-07	58	-27	21	-10	37	34	27	25	26	40	17	22
	23	47	45	28	12	06	68	-36	09	27	44	43	72	55	70	-39	43	02	47	29	21	17	17	26	12	15
8. Aggression Control	14	32	28	29	12	17	66	-46	04	27	54	08	76	67	75	-57	53	03	56	21	05	06	03	06	04	-03
	30	34	34	29	06	00	53	-01	04	30	53	90	40	-30	55	-28	39	03	38	28	11	39	19	36	34	05
	21	34	31	30	08	13	61	-26	07	29	50	41	62	44	65	-34	47	08	47	25	08	22	11	21	18	02
9. Liking Others	25	34	31	18	12	05	60	-28	26	29	59	14	78	52	72	-60	54	02	54	36	35	23	24	20	22	25
	17	21	31	08	09	24	-30	06	-03	-07	-15	-35	-37	49	-19	-04	-26	-23	-16	18	-11	14	11	15	-08	18
	19	31	32	15	09	09	38	-19	18	20	35	03	59	50	55	-35	34	-01	36	28	14	18	19	18	-02	23
10. Social Acceptance	19	28	38	05	29	47	63	01	31	57	36	-19	23	30	30	-09	58	37	42	21	38	24	20	29	09	21
	21	37	42	17	19	30	-27	15	-32	-06	12	06	-04	14	09	16	-01	14	04	21	02	19	04	27	-03	27
	18	33	40	12	23	48	46	15	28	51	44	03	34	36	41	18	55	48	49	21	21	21	13	28	04	24
11. Being Liked	14	28	31	07	19	67	80	05	49	78	70	29	68	50	70	-04	84	59	80	28	30	24	13	26	09	20
	26	27	29	18	07	27	13	17	-13	20	25	07	46	64	50	16	03	17	31	13	-11	24	17	19	12	35
	18	29	31	13	12	58	62	16	36	64	60	29	67	55	69	16	65	53	70	21	09	24	15	23	10	28
12. Popularity	07	28	32	12	39	35	39	-19	19	31	33	41	41	17	39	-19	36	15	34	24	26	09	13	21	24	25
	27	25	27	06	-09	20	35	-08	05	26	17	46	49	28	48	10	-17	-03	30	13	06	06	00	09	07	19
	18	26	29	09	14	32	39	-12	17	31	30	43	43	21	41	-02	25	15	34	19	17	08	07	15	16	22
A. Individual Action	17	40	41	20	26	16	73	-27	08	37	64	09	57	50	62	-31	51	18	52	23	31	13	23	25	18	31
	19	29	31	14	02	58	47	20	38	62	23	20	22	07	26	-10	08	-04	39	28	24	26	17	33	40	27
	17	35	37	17	13	33	66	-05	25	49	55	20	55	47	59	07	46	25	54	26	28	19	21	29	27	29
B. Social Interaction	25	47	46	23	22	14	69	-48	19	29	62	17	84	66	82	-57	59	07	61	32	25	19	13	24	09	09
	33	40	43	27	04	10	73	-04	08	44	44	83	38	-35	50	-40	38	-09	38	35	21	31	18	44	28	14
	25	46	46	27	11	16	71	-29	20	36	55	40	73	50	72	-36	54	11	54	34	22	25	16	34	18	13
C. Affective Relationships	21	37	42	13	31	50	77	-12	42	63	64	18	65	46	66	-27	75	38	67	34	40	25	21	30	14	29
	27	34	39	15	08	34	00	12	-12	14	15	09	25	53	34	16	-12	05	20	19	-04	19	10	22	05	31
	23	36	41	15	18	50	59	03	34	55	55	23	63	51	65	03	58	40	61	27	19	22	16	26	10	31
T. Total Score	24	47	49	21	30	29	82	-35	25	47	71	18	80	63	80	-45	69	22	68	32	35	20	20	29	15	26
	30	40	43	21	05	40	57	11	17	53	38	54	37	01	46	-19	20	03	43	31	16	29	17	38	28	27
	25	45	47	23	16	36	75	-14	29	53	63	34	74	57	76	-18	60	26	65	32	25	24	19	33	21	27

*Each entry consists of three correlations. From top to bottom they represent boys, girls, and both sexes.

both sexes combined are based on 20 to 21 cases. Even though conditions suggest caution in interpreting the correlations between peer ratings and PIB scores, the following relationships are of interest.

At the first grade level, the correlations show a mixed set of relationships. The teachers' assessment of individual prosocial action is in direct agreement with the peer ratings for the girls being rated, but is generally the opposite of the pupils' judgments of the boys on this aspect of behavior. The agreement between teachers and pupils on students' social interaction is generally low whether boys or girls are being rated. Regardless of the sex of the student rated, the relationship between teacher assessment and peer ratings of affective relationships is very weak.

For the fourth grade data, the correlations show generally direct relationships which are stronger than those found for first-graders. The direction and magnitude for the relationships are somewhat dependent upon ratee sex, but not as much as was evident in the first grade data. The strongest agreement between teachers' and pupils' judgment of students' social behavior is for social interaction, followed by individual prosocial action and affective relationships.

The correlations of the peer rating scale with other measures are generally low where little or no relationship would be expected.

As a further means of evaluating the relationship of the peer ratings with other variables, canonical correlations were computed between the peer rating subscale scores (Individual Prosocial Action, Social Interaction, and Affective Relationships) and six other measures related to socialization. The results appear in Table 22. At the first grade level the other measures were the home learning environment and the parents' concern about education, maturity demands, acceptance, permissiveness, and restrictiveness with respect to the child. These measures were obtained from the Parent Questionnaire. The canonical correlation, R_c, is .48 for the first grade data. At the fourth grade level the other measures were the child's attitude toward school, the home learning environment, the quantity and quality of TV viewing, parental resignation, and permissiveness with respect to the child. Attitude toward school was obtained from the Attitude Toward School instrument. The other measures were obtained from the Parent Questionnaire. From the fourth grade data, R_c is .61. These results indicate some common variance among these variables and thus some convergent validity.

An examination of the canonical weights indicates that the Social Interaction scale is the most important component of the peer rating scale in relation to the other measures analyzed. This is true at both the first and fourth grade levels. Among the other measures, when related to the peer rating scale, parental maturity demands is the salient component for the first grade data, whereas parental permissiveness is the strongest component at the fourth grade level. This may indicate a difference between grade levels in the type of parental influence operating to promote socialization.

TABLE 22

Canonical Correlations with Other Measures
Peer Rating Scale

Grade One (N=91)

Number of Roots Removed	Eigenvalue	Rc	Wilk's	X^2	df	p
0	.228	.48	.681	33.00	18	.05
1	.094	.31	.883	10.75	10	.05
2	.026	.16	.974	2.30	4	.05

Coefficients for Canonical Variables

PRS	
Scale A - Individual Action	.447
Scale B - Social Interaction	-.855*
Scale C - Affective Relationships	.595
Other Measures	
Home Learning Environment	-.077
Parental Concern about Education	-.468
Parental Maturity Demands	-.669*
Parental Acceptance	.164
Parental Permissiveness	-.175
Parental Restrictiveness	-.593

Grade Four (N=86)

Number of Roots Removed	Eigenvalue	Rc	Wilk's	X^2	df	p
0	.376	.61	.583	43.69	18	.001
1	.055	.24	.934	5.49	10	.05
2	.011	.10	.989	0.88	4	.05

Coefficients for Canonical Variables

PRS	
Scale A - Individual Action	-.518
Scale B - Social Interaction	-.948*
Scale C - Affective Relationship	.660
Other Measures	
Attitude Toward School	-.465
Home Learning Environment	-.311
TV Quantity	-.441
TV Quality	.353
Parental Resignation	.309
Parental Permissiveness	-.606*

* Largest Loading in Vector

The following conclusions seem warranted from the results of the Indianapolis testing:

1. Items discriminated adequately for both grade levels and responses were well spread across the alternatives.

2. Reliability estimates for interjudge agreement and internal consistency were satisfactory for the 60-item form (grades 3 to 6), but are less than adequate for the 36-item form for first and second graders. Thus, it is recommended that the 60-item form be used in the longitudinal study for first and second graders in spite of some fatigue problems. Answer booklets for grades 1-2 will contain only the responses "yes-no-sometimes." Answer booklets for grades 3-6 will contain the responses and the questions, so the child can read along with the examiner.

3. Differences between sexes in the Peer Rating Scale factor structure are evident.

4. Peer Rating Scale administration time varies from 20 to 40 minutes, depending largely on grade level.

5. Problems encountered in administration can be solved through adequate planning, clerical assistance, prior contact with school personnel, training of examiners and assistants, testing in small groups, and maintaining a surplus of expendable materials. These problems in testing in Indianapolis probably contributed to some of the lower reliability in the first grade results.

6. The vocabulary used in Peer Rating Scale items is appropriate for the grade levels examined.

7 The Peer Rating Scale factor structure becomes more stable at the higher grade levels and offers some support for the hypothesized Individual Prosocial Action --Social Interaction -- Affective Relationships structure.

8. Evidence for convergent validation of the Peer Rating Scale is provided by high intercorrelations and significant canonical analysis results between the Peer Rating Scale scales and other measures related to socialization.

Pupil Information Booklet

The Pupil Information Booklet is designed to obtain information on the children selected for the cohorts. The booklet is divided into three sections. The first section contains 26 items that ask the teacher for demographic information on the child. Questions 1-7 were adopted from the Pupil Questionnaire used in the Coleman Study. Questions 8-19, adapted from the AIR Pupil Information Book, ask the teacher to identify specific physical, learning, or social handicaps that interfere with the child's day to day functioning. Questions 20-26 identify specific talents the child has demonstrated.

Section 2 consists of 27 statements, selected from the AIR Pupil Information Book. These items require the teacher to rate the child's independence, leadership, competition, cooperation, compliance and social behavior. The ratings are made on a 5 point scale, typically ranging from almost always to almost never. The ratings were scored for three subscales, Independence, Cooperativeness, and Social, which correspond to the Peer Rating subscales Individual Action, Social Interaction and Affective Relationships, respectively.

Section 3 asks the teacher to rate the student on 13 separate behavioral descriptions taken from Spaulding's Coping Analysis Schedule (1967). The ratings are made on a 5 point scale indicating the frequency with which the child displays the designated behavior.

In the testing in Indianapolis, each teacher was asked to complete a Pupil Information Booklet for 3 randomly selected children. Item-subscale correlations for Independence, Cooperativeness, and Social are reported in Table 23. Only two items (33 and 38) appear to have very low correlations with their respective subscales.

Correlations with Other Variables

Table 24 presents the correlations for first and fourth grades between the subscales of the Pupil Information Booklet and between the Pupil Information Booklet subscales and the Peer Rating subscales. At the first grade level, there appears to be little correspondence between the teachers' and students' perceptions of the characteristics. This lack of relationship, however, may be a function of the difficulty of obtaining adequate measures from first grade children with large group testing.

At the fourth grade level, the Pupil Information Booklet subscales correlate significantly with the Peer Rating subscales. For the 21 fourth grade children studied, Independence, as rated by the teachers, correlated .49 with Individual Action as rated by peers. Cooperativeness as viewed by the teachers correlated .72 with Social Interaction as seen by peers. Social behavior noted by the teachers correlated .40 with the Affective Relationships noted by the peers. These relationships suggest that teachers can provide information about the personal-social

TABLE 23

Item Correlations with Subscale Totals
Pupil Information Booklet

Item	Independence	Cooperative	Social	Total
27.	.58			72
28.			.66	75
29.		.83		59
30.			.42	68
31.	.64		.56	39
32.	.59			25
33.		.17		41
34.	.60			32
35.		.65		34
36.		.80		66
37.	.75			57
38.	.15			10
39.	.66			77
40.	.79			78
41.			.36	-1
42.			.66	45
43.		.59		66
44.		.60		67
45.			.52	57
46.			.47	31
47.		.78		68
48.	.57			34
49.	.62			55
50.			.43	27
51.		.82		63
52.		.59		38
53.		.87		74
Mean	31.17	34.07	24.17	86.24
SD	6.20	7.03	3.44	13.51

TABLE 24

Correlations Among Pupil Information Booklet Subscales
and Between Pupil Information Booklet Subscales and Peer Rating Subscales

Grade 4 (N = 21)

Pupil Information Booklet					Peer Rating		
		A	B	C	A	B	C
Pupil	A	-	.63**	.79**	.49*	.36	.55**
Information	B		-	.63**	.59**	.72**	.65**
Booklet	C			-	.25	.11	.40*

Grade 1 (N = 20)

Pupil Information Booklet					Peer Rating		
		A	B	C	A	B	C
Pupil	A	-	.30	.70**	.05	.00	.20
Information	B			.47*	.15	.32	.54**
Booklet	C			-	.11	.04	.19

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

Pupil Information Booklet

A Independence
B Cooperativeness
C Social

Peer Rating

A Individual Action
B Social Interaction
C Affective Relationships

development of children which is not at variance with the perceptions of the classmates rating the same children. This is truer of the children in fourth grade than in first grade, probably because of the lower reliability of the measures of pupil perceptions at the lower grade level.

Section 3 of the Pupil Information Booklet lists 13 classroom behaviors of pupils and asks the teacher to indicate whether the behavior is characteristic of the child being rated. The behaviors listed range from disruptive, distracting conduct through paying attention to passive response or withdrawal. All 13 behaviors reflect methods of coping with school work and with the constraints and requirements involved in working with the teacher and classmates. Table 25 presents the correlations among the teachers' ratings of pupils on the 13 Coping Analysis Scales, the ratings assigned by the same teachers to the same children on certain aspects of personal-social development (Section 2) and the ratings assigned by peers.

The most significant cluster of correlations observed in Table 25 is the group of high negative relationships between teachers' ratings of Cooperativeness and their assessments of Aggressive Behavior, Attention-Getting, Manipulating Others and Resisting Authority. In grade one there are also negative correlations between peer ratings of Affective Relationships and teachers' ratings of this same group of disruptive, distracting behaviors.

A second cluster of significant correlations occurs between the Cooperative and Social scales and the Coping Analysis dimensions of Sharing and Helping and Social Interaction. This cluster, again, suggests a rather high degree of consistency toward students across reporting modes.

In summary, the Pupil Information Booklet provides important information about the student regarding demographic characteristics, personal-social development and the student's characteristic manner of coping with the class environment. The Indianapolis data provided some indications of convergent validity for the personal-social and Coping Analysis scales. Teachers completing the booklets reported that the time required did not seem excessive or burdensome. All indications are that the booklet will provide useful global assessments by the teacher of the children selected for the cohorts.

TABLE 25

Correlations Between Coping Analysis Scales and Subscales from the Pupil Information Booklet and Peer Rating Scale

Coping Analysis Scales	Pupil Information Booklet						Peer Rating Scale					
	Independence		Cooperativeness		Social		Individual Action		Social Interaction		Affective Relationships	
	G1	G4	G1	G4	G1	G4	G1	G4	G1	G4	G1	G4
1. Aggressive Behavior	-.09	-.39	-.85**	-.71**	-.15	-.40	-.20	-.45	-.25	-.37	-.57**	-.29
2. Attention-Getting	.00	-.48	-.79**	-.83**	.00	-.51*	-.08	-.61**	-.34	-.57**	-.60**	-.38
3. Manipulating Others	-.01	-.24	-.77*	-.53*	.05	-.17	-.14	-.12	-.27	-.05	-.60**	-.32
4. Resisting Authority	-.13	-.63**	-.83**	-.85**	-.11	-.50*	-.15	-.33	-.30	-.43	-.56**	-.28
5. Self-Directed Activity	.12	.62**	.09	.46	.28	.35	-.14	-.02	-.15	.05	-.27	-.09
6. Paying Attention	.67**	.36	.54*	.50*	.61**	.10	-.05	.28	.13	.24	.16	.21
7. Sharing & Helping	.79**	.66**	.13	.55*	.42	.62**	-.12	.25	-.16	.24	.08	.33
8. Social Interaction	.64**	.74**	.58*	.80**	.66**	.60**	.14	.54*	.19	.70*	.47	.58*
9. Seeking Support	-.12	.00	-.03	-.02	.35	.45	-.06	.14	-.04	-.03	-.25	.15
10. Following Passively	-.58*	.29	-.38	-.04	-.49*	-.27	.06	-.30	-.08	-.04	-.12	-.21
11. Observing Passively	-.35	-.59*	-.32	-.69**	.07	-.32	-.11	-.75**	-.06	-.65*	-.36	-.51
12. Responding to stimulu	-.61**	-.63**	-.37	-.78**	.21	-.39	-.27	-.61**	-.24	-.62*	-.44	-.47
13. Physical Withdrawal	-.29	.11	-.72**	-.28	.26	-.11	.03	-.12	.09	-.23	-.31	.06

Grade 1 (G1) N = 20
Grade 4 (G4) N = 21

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

Parent Questionnaire and Parent Interview Schedule

It has long been recognized that parents have an important influence on the development of their children. However, it is by no means clear which parental variables are most significant in their effect on children's characteristics and performance.

Based on a survey of existing literature, a number of parent variables were identified and considered for inclusion in the Parent Questionnaire. In working toward a decis on which parent variables to include, several criteria were used. Firs, here should be some evidence that a parent variable is related to one or more of the child variables to be measured. Second, the parent variable should be capable of measurement within the questionnaire format. Third, other than for some objective demographic information, measurement of a variable by a single item or only a few items will be considered as providing too little reliability and score variability to be of value for this kind of study. Finally, parent variables related to children's social-emotional characteristics as well as to their intellectual characteristics should be included.

Investigations of parent characteristics related to children's intellectual abilities and school achievement tend to have made greater use of the interview-questionnaire technique than investigations of children's social-emotional characteristics. Here, direct observation of interaction between parent and child in the home or in the laboratory with subsequent rating of parent characteristics seems to have been the rule rather than the exception. Such variables as parental warmth, nurturance, control techniques, language, and various other child rearing practices have not been measured by direct report of the parent. A further difficulty in identifying parent characteristics related to children's social-emotional characteristics is that measurement of child characteristics has in itself been poor and thus possible relationships may have been obscured by measurement error.

The Parent Questionnaire is designed for parents of elementary school children. It is intended to be used with the child's mother, or the person acting as the child's mother. Retrospective da a have not been included, nor have items which might yield normative survey information on parent ticies and home conditions. A set of scales was designed to measure pa variables which the literature indicates may be related to the cogn ve and affective characteristics of the child.

The Parent Questionnaire consists of scales measuring fourteen parent variables plus a section devoted to demographic variables. Each of these will be described in turn.

1. Parent's achievement aspirations for the child. Items 1-7 measure the extent of the parent's educational and occupational aspirations for the child. Coded responses are summed over the seven items to yield a total aspiration score. A high score represents high parental aspirations for the child.

A mother's high aspirations for her child and pressures on him to achieve influence both the child's motivation to achieve and his actual achievement performance (Rosen & D'Andrade, 1959; Bing, 1963; Wolf, 1964; Marjoribanks, 1972).

2. Home learning environment. Items 8-18 measure aspects of the child's home environment which provide intellectual stimulation to the child. Coded responses are summed over the eleven items to yield a total learning environment score.

Children who score high on achievement tests tend to come from homes where the parents are interested in stimulating the child intellectually. This stimulation is provided when books and materials to explore and manipulate are available (Milner, 1951; Rosen & D'Andrade, 1959, Bing, 1963) when learning situations are created in the home (Dave, 1963; Wolf, 1964; Majoribanks, 1972), when the child is read to by personally important adults (Milner, 1951), and when provisions are made for toys, games, play space, and opportunities for self-initiated play (Milner, 1951).

3. Parental concern and interest in child's education. Items 19-24 measure the parent's concern for and interest in the child's education, including an awareness of what and how the child is doing in school. Coded responses are summed over the six items to yield a total score.

There is a relationship between the parents' interest in their child's intellectual achievement and the latter's academic performance (Rosen & D'Andrade, 1959; Witkin, et al., 1962; Mannino, 1962; Dave, 1963; Wolf, 1964; Marjoribanks, 1972).

4. Parental demand for maturity or independence. Items 25-31 measure the parent's demand for independence or maturity on the part of the child by means of determining the ages by which they expect

a child to have mastered a variety of developmental tasks. Coded responses are summed over the seven items to yield a total score. A high score indicates a stronger parental demand.

The relationship between the parent's maturity demand and the child's achievement has been demonstrated by many researchers, although there is some evidence that the relationship depends both on the age of the child and the task (Chance, 1961; Crandall, et al., 1964; Rosen & D'Andrade, 1959; Shaw, 1964; Winterbottom, 1958; Witkin, et al., 1958; Busse, 1967; Bayley & Shaefer, 1964; Marjoribanks, 1972). There is also evidence that parental maturity demand is related to assertiveness and independence in children (Baumrind & Black, 1967; Baumrind, 1972a, b; Becker, 1964).

5. Quantity of TV. Items 32-34 attempt to measure the amount of th child's television viewing. Coded response items are summed over the three items to yield a total score. A high score indicates extensive viewing by the child.

6. Parental restriction of TV. Items 35-37 measure the amount of parental control of television viewing. Coded response items are summed over the 3 items to obtain a total score. A high score on the parental control scale indicates high parental restriction on the child's viewing.

While the relationship of television viewing to child characteristics is not entirely clear, studies of Bandura and others suggest that unrestricted viewing of TV violence may be related to children's aggression in certain situations.

7. Parental activities. Items 38-44 measure the extent of the parents' involvement in school and community activities outside the home. Coded responses are summed over the seven items to yield a total score. A high score indicates high parental involvement in school and community activities; a low score indicates low activity or noninvolvement.

Parent activities are related to the child's achievement (Dave, 1963; Wolf, 1964; Marjoribanks, 1972), and may also be rela od to child's attitude toward school, leadership, and cooperativeness.

Parental attitudes toward education. Items 45-60 measure three parental attitudes toward education from the Hess Educational Attitude Survey: resignation, futility, and conservatism.

8. Resignation (to the role of the poor in the educational and social system). Coded items 45, 53, 54, 56, 57, 58 are summed to give a resignation score.

9. Futility (or the parent's felt lack of effectiveness in their relationship to the schools). Coded items 46, 47, 51, 59, 60 are summed to give a futility score.

10. Conservatism (support of a traditional 3 Rs approach with a somewhat "distant" teacher). Coded items 48, 49, 50, 52, and 55 are summed to give a conservatism score.

These three variables were found to be related to the child's school achievement (Hess, 1969; Westinghouse, 1969) and to the child's self-concept and attitudes (Cicirelli, unpublished).

11. Parental acceptance of child. Items 61-69 measure parental attitude of acceptance of the child. Coded responses are summed over the nine items to yield a total score. A high score indicates parental acceptance of the child; a low score indicates a rejecting, punitive attitude.

Parental acceptance of the child is related to child intelligence and achievement (Itkin, 1962; Hurley, 1965) as well as to the social-emotional characteristics of the child, such as self-concept, cooperativeness, and aggression (Bayley & Schaefer, 1960; McCord, et al., 1961).

12. Parental permissiveness. Items 70-76 measure parental permissiveness in child-rearing. Coded responses are summed over seven items to yield a total score. A high score indicates parental permissiveness.

Permissiveness in child rearing has been related to such child characteristics as high achievement, independence, assertiveness, cooperation, and lower aggression (Drews & Teahan, 1957; Baumrind, 1972a, b; Watson, 1957; Becker, 1964).

13. Parental restrictiveness. Items 77-85 measure the extent to which the parent controls the child's life through extensive rules and restrictions. Coded responses are summed over the nine items to yield a total score; a high score indicates high restrictiveness.

High parental restrictiveness has been related to dependent, conforming and submissive behavior in children, with inhibited aggressiveness (Becker, 1964; Baumrind, 1972a, b).

14. Parent authority attitude. Items 86-94 measure authoritarian attitudes in the parent (respect for authority, parent as authority figure). Responses are summed over the nine items to yield a total score; a high score indicates more authoritarian attitudes.

Authoritarian attitudes on the part of the parent are related to conformity, and dependence (Baumrind, 1971, 1972a, b; Becker, 1964).

Demographic variables. Items 95-116 and introductory items A, B, and C assess demographic variables, including the following:

a. relationship to child
b. education (mother and father)
c. occupation (mother and father)
d. income
e. age (mother and father)
f. family size (including sibling structure)
g. type of housing
h. person/room ratio
i. marital status
j. language spoken in the home
k. preschool experience
l. educational television experience

Table 26 summarizes the expected relationships between parent and child variables.

The final form of the Parent Questionnaire grew out of earlier forms culminating in an interview schedule containing 127 items (plus 3 introductory items). A parallel questionnaire form was constructed in which the identity of the items was maintained, but with wording modified for the questionnaire format.

In addition, a short questionnaire form was also developed with selected items from the long questionnaire comprising four subscales; there were 45 items in all (plus introductory items as above).

In the field tryout conducted in Indianapolis, 227 long questionnaires and 171 short questionnaires were sent to parents of first and fourth grade children in five selected schools. The frequency of returns of the questionnaire exceeded our expectations. Of the long form questionnaires, 64% were returned. Of the short form questionnaires, 73% were returned. From these figures, it appears that length of questionnaire is not a major factor affecting returns and no further consideration was given to development of a short questionnaire.

Interview schedules were administered to parents who failed to respond to the questionnaire forms, and who agreed to be interviewed.

This section presents the data obtained from the Indianapolis sample. All item numbers refer to the revised instrument presented in the Appendix.

Table 27 shows the relative response frequencies to the response alternatives for each item, item mean and standard deviation (for items where these are meaningful), and item-total correlation (for those items making up a subscale). In Table 28 means and standard deviations for subscales are presented.

Table 26

Summary of Expected Relationships Between Parent and Child Variables

	Achievement	Self-concept	School attitude	Aggression	Assertiveness	Dependency	Cooperation	Independence	Conformity
1. Parental aspiration for child	X		X						
2. Learning environment	X								
3. Concern for education	X								
4. Maturity demand	X				X			X	
5. Quantity of TV				X					
6. Parental restriction of TV				X					
7. Activities of parents	X		X				X		
8. Resignation	X	X	X						
9. Futility	X	X	X						
10. Conservatism	X	X	X						
11. Acceptance of child	X	X		X			X		
12. Permissiveness	X			X	X		X	X	
13. Restrictiveness				X		X			X
14. Authoritarian attitudes						X			X

Table 27

Summary Statistics
Parent Questionnaire

Item	Item-Total Correlation	Mean	Standard Dev.	Percent choosing response alternatives 1	2	3	4	5	6	7	8	
Items 1-7 Parent's aspiration (Alpha .71)												
1	.37	3.80	1.12	0	11	41	9	37	2			
2	.69	4.41	1.32	1	28	27	14	25	4			(DK*=1)
3	.64	3.41	1.46	3	40	19	12	11				(DK=16)
4	.46	3.88	1.26	11	1	18	30	41				
5	.71	3.36	2.68	0	3	5	12	12	17	13		
6	.22	2.33	.88	7	66	26						
7	.45	3.23	1.44	22	8	16	34	20				
Items 8-18 Learning Environment (Alpha .79)												
8	.49	3.97	.81	2	2	15	59	21	1			
9	.69	2.45	1.36	33	22	25	6	13				
10	.60	2.58	1.08	17	31	34	12	6				
11	.57	2.50	1.04		18	34	30	18				
12	.59	2.06	.77		21	55	20	4				
13	.49	2.75	1.04	11	30	37	16	6				
14	.59	3.01	1.06	6	25	41	16	11				
15	.40	2.12	.92		24	50	16	9				
16	.51	3.39	.98	6	5	43	34	17				
17	.36	3.42	.99	4	16	27	43	11				
18	.64	2.95	1.15	24	36	15	21	4				
Items 19-24 Parental concern for child's education (Alpha .70)												
19	.49	2.95	1.15	13	20	34	25	18				
20	.61	2.83	1.57	34	8	22	13	23				
21	.38	2.17	1.03	27	44	21	4	5				
22	.61	4.18	1.05	4	1	22	20	53				
23	.37	3.44	1.04	5	9	41	28	18				
24	.54	2.74	1.31		23	20	29	16	10			
Items 25-31 Parental demand for maturity (Alpha .75)												
25	.64	2.84	1.20	18	18	35	21	7	1			
26	.61	3.45	1.18	4	19	28	29	17	3			
27	.66	3.38	1.36	10	18	23	26	18	5			
28	.51	3.57	1.35	4	21	26	21	19	9			
29	.51	3.51	.99	5	6	36	37	15	0			
30	.56	3.08	1.50	19	20	21	24	9	8			
31	.70	2.76	1.40	28	12	30	21	6	4			

*DK = don't know

Item	Item-Total Correlation	Mean	Standard Dev.	Percent choosing response alternatives 1	2	3	4	5	6	7	8
Items 32-34	Quantity of TV (Alpha .76)										
32	.84	3.57	1.27	5	11	36	27	10	11		
33	.78	4.26	1.19	4	2	13	40	25	16		
34	.68	4.67	.93	1	3	3	25	56	12		
Items 35-37	Parental Restriction of TV (Alpha .70)										
35	.82	2.97	.96	8	15	58	11	7	1		
36	.81	2.81	1.10	16	17	46	14	14	8		
37	.75	2.04	1.06	42	23	27	6	2			
Items 38-44	Parental activities (Alpha .76)										
38	.58	2.04	1.18		47	19	22	8	4		
39	.64	1.33	.67		77	13	9	1	0		
40	.81	1.82	.96		50	22	25	2	2		
41	.68	1.45	.80		72	13	12	2	0		
42	.70	2.03	1.17		44	26	16	9	4		
43	.60	1.60	1.06		68	15	7	6	3		
44	.40	1.61	1.13		66	25	8				
Items 45-60	(means and standard deviations are reported for items after recoding for scoring). Resignation (Alpha .47) Futility (Alpha .70) Conservatism (Alpha .60)										
45	.46	1.48	.77	63	30	5	0 (DK*=2)				
46	.66	2.97	1.19	11	36	49	3 (DK=1)				
47	.75	3.19	1.22	8	32	49	9 (DK=2)				
48	.64	3.90	.80	1	8	71	15 (DK=4)				
49	.66	3.96	.91	1	11	62	24 (DK=1)				
50	.53	3.95	.78	2	6	75	15 (DK=1)				
51	.56	3.07	1.20	10	32	49	5 (DK=3)				
52	.69	3.01	1.23	12	33	47	6 (DK=3)				
53	.70	2.05	1.21	41	37	17	4 (DK=1)				
54	.43	2.67	1.23	20	36	36	3 (DK=6)				
55	.61	3.75	1.07	6	13	62	19 (DK=1)				
56	.41	3.53	1.14	4	25	51	18 (DK=3)				
57	.60	2.36	1.20	26	43	25	3 (DK=3)				
58	.54	2.27	1.05	20	57	21	1 (DK=1)				
59	.69	3.05	1.21	8	31	45	8 (DK=1)				
60	.70	3.39	1.13	6	26	58	9 (DK=1)				

*DK=don't know

Item	Item-Total Correlation	Mean	Standard Dev.	Percent choosing response alternatives 1	2	3	4	5	6	7	8
Items 61-69	Parental acceptance of child (Alpha .62)										
61	.39	4.43	.74	0	1	15	31	57			
62	.70	3.30	1.25	11	15	28	27	20			
63	.67	3.61	1.17	4	16	21	31	28			
64	.66	3.82	1.03	3	11	15	45	27			
65	.52	3.83	.74	0	1	33	48	18			
66	.43	4.38	.81	1	2	10	33	54			
67	.56	4.11	.93	5	17	37	41				
68	.45	3.48	.83	2	4	48	35	11			
69	.30	3.73	.98	7	12	25	38	24			
Items 70-76	Parental permissiveness-subscale (Alpha .60) (Mean and standard deviation reported for items after recoding for scoring)										
70	.16	2.30	.97	21	40	28	9	2			
71	.46	2.21	1.07	29	37	23	7	4			
72	.52	3.09	1.33	14	24	22	21	19			
73	.53	1.74	.82	46	39	11	4	0			
74	.53	1.59	.73	54	36	8	2	0			
75	.55	1.74	.77	42	44	11	1	1			
76	.06	1.62	.77	53	35	9	3	0			
Items 77-85	Parental restrictiveness-subscale (Alpha .45) (Mean and standard deviation reported for items after recoding for scoring)										
77	.26	1.85	.41	17	81	2					
78	.54	1.63	.80	57	24	20					
79	.35	1.67	.53	36	61	3					
80	.33	1.77	.57	30	63	7					
81	.43	1.28	.51	75	22	3					
82	.30	2.80	.48	4	13	84					
83	.43	2.21	.46	2	75	23					
84	.48	1.54	.55	49	48	3					
85	.48	1.93	.69	26	57	16	1				
Items 86-94	Parental authority attitude-subscale (Alpha .68)										
86	.59	1.85	.96	41	45	11	1	(DK=2)			
87	.45	2.20	.97	20	53	16	0	(DK=10)			
88	.50	1.83	.72	30	62	5	0	(DK=4)			
89	.53	1.89	1.09	6	6	46	41	(DK=1)			
90	.56	1.66	.78	46	47	3	1	(DK=3)			
91	.63	1.90	1.13	48	34	15	2	(DK=1)			
92	.44	3.20	1.21	9	50	32	8	(DK=1)			
93	.53	1.45	.75	63	34	1	2	(DK=1)			
94	.65	1.52	.63	53	43	1	0	(DK=3)			

*DK= don't know

Item	Item-Total Correlation	Mean	Standard Dev.	Percent choosing response alternatives 1	2	3	4	5	6	7	8
Items 95-116 Demographic data											
95	---	----	----	13	17	10	3	58			
96	---	----	----		46	9	11	33			
97	---	----	----		7	6	1	86			
98-99											
Mother's occupation		2.34	1.27	34	29	10	24	2	1	0	
Father's occupation		2.67	1.21	16	34	28	15	5	3	0	
				(1=unskilled, 2=semiskilled, 3=skilled, 4=small business, 5=adm. personnel, 6=managers, 7=executive & professionals)							
100	---	3.76	1.96	30	22	12	17	14	3	4	
101	---	3.42	1.16	4	16	36	28	10	6	0	0
102	---	3.40	1.44	6	25	26	25	9	6	2	1
103	---	2.92	.99	1	38	39	16	4	2	1	
104	---	3.33	1.04	1	19	43	25	10	2	1	
105	---	----	----	61	21	7	11	1			
106	---	5.63 (mean number of rooms per household: SD=2.00)									
107	---	3.79 (mean number of children per household: SD=1.84)									
108	---	6.74 (mean number of people in household: SD=7.12... this includes some cases apparently reporting the population of an apartment house...these cases were discarded for later work).									
109	---	----	----	96	2	0	1	1			
111	Older brothers Mean = .99; SD = 1.35										
	Older sisters Mean = .98; SD = 1.34										
	Younger brothers Mean = .52; SD = .74										
	Younger sisters Mean = .54; SD = .73										
	Brothers of same age (twins, etc.) Mean = .01; SD = .08										
	Sisters of same age (twins, etc.) Mean = .00; SD = .00										
112	---	----	---	Percentage attending							
	Day Care			5							
	Nursery			8							
	Kindergarten			80							
	Summer Head Start			8							
	Sunday School			38							
	Full Year Head Start			19							
113	---	---									
114	---	2.14(M)	1.59(SD)	61	6	8	9	16 (Percent choosing alternative responses)			
115	---	2.02(M)	1.41(SD	58	11	13	8	11 (Percent choosing alternative responses			

Item	Item-Total Correlation	Mean	Standard Dev.	Percent choosing response alternatives 1	2	3	4	5	6	7	8
116	Name & address of friend			Percentage giving							
				no resp.		no such person			incom.		compls.
				10			1			12	77
	---	----	----	95	0	0	0	2	0	2	1
B	---	----	----	61	2	14	1	4	1	7	12
C	Who answered questionnaire			Percentage responding							
				Mother			Father				
				97			3				

Table 28

Mean and Standard Deviations for Subscales

Parent Questionnaire

Subscale	M	SD
Parental Aspiration for child	23.45	6.53
Learning environment	30.16	6.48
Concern for education	17.50	3.88
Maturity demand	22.33	5.59
Quantity of TV	12.42	2.77
Parental restriction of TV	7.74	2.48
Activities of parents	11.32	4.52
Resignation	14.38	3.49
Futility	15.67	3.99
Conservatism	18.59	3.04
Acceptance of child (revised)	34.37	5.33
Permissiveness	23.26	3.57
Restrictiveness	20.16	2.19
Authoritarian attitudes	17.52	4.43

On the basis of subscale reliabilities and item-total correlations, three subscales were considered for revision: Acceptance of Child, Permissiveness, and Nonconformism.

A scale for Nonconformism was included in the questionnaire used in the Indianapolis testing. This scale had an extremely low reliability. Reanalysis following deletion of items which had poor item-total correlations failed to improve reliability substantially. As a result, the entire scale was dropped from the final form of the questionnaire.

On the Permissiveness scale, item 76 had a somewhat low item-total correlation. However, reanalysis of the scale with this item deleted failed to improve reliability, so the scale was retained in its original form.

The Acceptance of Child scale had an acceptable reliability, but three of the items had very poor item-total correlations. When these items were deleted, the internal consistency reliability was raised from .62 to .80, and item-total correlations for the remaining items also were improved. These were as follows:

Item	Item-Total Correlation
61	.50
62	.68
63	.68
64	.69
65	.59
66	.51
67	.60
68	.55
69	.34

In consequence, this revised form of the Acceptance of Child scale was used in the final form of the Parent Questionnaire.

The Parent Interview Schedule was used in the Indianapolis testing as a follow-up instrument for parents who failed to respond to the questionnaire. Out of 91 interviews attempted, 38 were completed in acceptable form. Of the 38, 53% were with parents of first grade children, 47% were with parents of fourth grade children; 55% were with parents of boys and 45% with parents of girls; 58% with white parents, 37% with blacks, and 5% with "other" racial-ethnic groups. Reasons for loss of sample in the follow-up were: 12 refusals, 10 couldn't locate, 9 completed forms for another child and 17 questionnaire forms returned.

Since only 38 interviews were completed, and those to a biased sample of respondents, no item analysis of the data was carried out. However, inspection of relative response frequencies for individual

items indicated that the pattern of responses was closely similar to those obtained with the questionnaire. On this basis, and by comparison with data from the pre-tryout, it was felt that results of the item analyses of the questionnaire subscales could be generalized to this closely similar form.

Final revision of items for the Parent Questionnaire and Parent Interview Schedule was based on USOE and OMB recommendations for editing items, relative response frequencies to the response alternatives, and comments of interviewers and staff. Most of the changes were minor changes in wording.

The revised instruments and manuals are in the Appendix. Following revision, there are 116 items (plus 3 introductory items).

While, in content, the Parent Questionnaire and Parent Interview Schedule are considered interchangeable, they may not be in practice. Obviously, the questionnaire form presents the advantage of lower administration cost (although it requires hand coding of parent responses to a number of items on the returned questionnaire, thus adding to the apparent cost).

The interview schedule has an initially greater cost of administration; however, since coding is completed on the spot by the interviewer, later data processing costs are less. The great advantage of the interview schedule rests in the ability of the interviewer to elicit more complete and accurate data than can be obtained with the questionnaire. For the longitudinal study, the value of the trained and tactful interviewer in generating continued parent support for the study cannot be underestimated. In sum, then it is recommended that the interview schedule be used if funds permit.

Pupil Description of Teaching

There has been some research to date supporting the notion of using students as raters of teaching behavior (Rosenshine & Furst, 1973; Stelle, House and Verins, 1971). These studies generally support the notion that students can provide reliable rating of classroom experiences.

For the present study a Pupil Rating Scale was constructed on which students could indicate the presence or absence of a variety of teaching behaviors in their classroom. The "About School" scale used by children in Project Prime and a rating scale reported by Vakil (1970) were used as a basis for development and construction of specific items. Eight separate subscales were developed: (1) clarity, (2) enthusiasm, (3) difficulty level of lessons, (4) individualization, (5) cognitive level of instruction, (6) variety, (7) democracy, and (8) control strategies. The scales and items corresponded directly to section I of an early form of the Teacher Questionnaire. The selection of the 8 variables to be measured by these scales was based on a review by Rosenshine & Furst (1973), reporting 9 variables which had been found consistently related to pupil learning outcomes. Variables 1-6 were selected from the review. Variables 7 and 8 were developed to provide measures of the teachers' more affectively-oriented behaviors.

The 44 item Pupil Rating Scale was administered in the Indianapolis testing. The Indianapolis data indicated that the subscales did not have sufficient reliability for use in the study. Further analysis suggested that there might be a single theme underlying most of the items: class management practices contributing to pupil satisfaction.

Subsequently, the item pool was expanded to 116 items and another attempt was made to delineate eight subscales: warmth, enthusiasm, clarity, variety, individualization, feedback, cognitive demand and freedom. These subscales corresponded directly to Section I of the revised Teacher Questionnaire and to the revised Observer Rating Scales.

The 116 item questionnaire was administered to 228 elementary school pupils in grades 1-6 in Monon, Indiana. Item analysis of the Monon data resulted in reduction of the questionnaire to 73 items, reflecting the eight new dimensions.

The 73 item questionnaire was administered to 167 pupils in grades 1-6 in Battle Ground, Indiana. Component analysis, varimax rotation, of the data revealed 53 items loading onto component I and no other major components. Table 29 reports the loadings on component I which exceeded .30.

Analysis of the items indicates that this component might appropriately be called Pupil Comfort. It may reflect the quality described by Rogers (1962) as the helping relationship. This component is similar to the theme of pupil satisfaction identified in the earlier form of the questionnaire. It seems to indicate that such teacher characteristics as warmth, enthusiasm, clarity, variety, individualization, feedback, cognitive demand and freedom

Table 29

Item Loadings

Pupil Description of Teaching

(Battle Ground Data)

Item	Loading	Item	Loading
1	Example	29	.80
2	Example	30	.85
3	Example	31	.72
4	.46	32	.81
5	.47	33	.44
6	.36	34	.88
7	.41	35	.82
8	.60	36	.59
9	.88	37	.69
10	.72	38	.82
11	.93	39	.77
12	.92	40	.76
13	.46	41	.85
14	.60	42	.80
15	.77	43	.60
16	.75	44	.86
17	.50	45	.88
18	.63	46	.55
19	.70	47	-.35
20	.58	48	.57
21	.82	49	.41
22	.78	50	.70
23	.78	51	.82
24	.78	52	.74
25	.51	53	-.45
26	.83	54	.33
27	.65	55	.32
28	.78	56	.31

may add up to a global dimension of Pupil Comfort. No significant correlations were obtained between this dimension of Pupil Comfort and the dimension of the Observer Rating Scale for the seven Battle Ground teachers.

The Pupil Description of Teaching, presented in the Appendix, is made up of the 53 items which reflect the Pupil Comfort dimension, plus three examples. It is recommended that this 56 item questionnaire be used in the field test.

Teacher Questionnaire

The Teacher Questionnaire is designed to provide demographic information about the teacher, information on the school organizational climate, information about instructional and classroom management practices, and a measure of the teacher's verbal facility.

The original Teacher Questionnaire, containing 100 items, was completed by seven teachers in grade 1 and seven teachers in grade 4 in Indianapolis. The revised form, containing 71 items, appears in the Appendix. Item numbers in this discussion refer to the revised questionnaire.

Section 1, Teacher Characteristics

Section 1 contains 23 items (1-23) that identify specific teacher traits and characteristics (sex, race, age, experience, attitudes toward students, satisfaction with teaching, problems in teaching, etc.). The first questions in this section are classificatory and were adapted from Coleman's Teacher Questionnaire. They include the two teacher background variables which Coleman found positively associated with school achievement, particularly when achievement was analyzed for black pupils: teac her's educational level and experience.

The next nine questions measure the teacher's perceptions of pupil and parent characteristics which may impede his teaching. While there is a large amount of heterogeniety in the nature of the problems described, the items are pooled in an effort to achieve a subscale with reasonably high reliability. Thus, questions 15-23 are summed to yield a subscale measuring problems encountered in teaching. Scores can range from 0-9, with 9 indicating that every item was perceived as a problem for the teacher.

Section 2, School Climate

Section 2 contains ten items (24-33) designed to measure the teacher's perception of the school organizational climate. In constructing the school climate scale, ten items were taken from "The Organizational Structure Questionnaire" developed by Mansfield (1967). Based on Hall's (1963) original work in developing an instrument to measure the degree to which a formal organization is bureaucratic, Mansfield's questionnaire measures the degree to which a "hierarchy of authority" exists in an educational institution. On the basis of a series of factor analyses, Mansfield concluded that the seventy items included on his questionnaire were essentially unidimensional.

In order to determine the internal consistency of the ten items that were selected, each item score was correlated with the subscale total. Table 30 reports item to total correlations for each item. Since only 14 teachers completed the questionnaire, the results are only suggestive. Four of the items have relatively high correlations with the subscale total; four others have moderate correlations with the subscale total score.

Table 30

Correlations Between Item and Total School Climate Scores

Teacher Questionnaire

Item	Item Description	Item - Total Correlation
24	Teachers Accept Principal's Decisions	.39
25	Teachers Schedule Field Trips Through Principal	.47
26	Teachers Enforce Rules Regarding Outsiders	.61*
27	The Staff Makes Decisions About School Policy	-.33
28	All Teachers Must Be In Their Classrooms At a Set Time	.31
29	Teachers Rigidly Enforce Rules Concerning Pupil Behavior	.31
31	The Administrator's Way Is the Only Acceptable Way	.74*
32	Decisions Concerning the Selection of Textbooks Are Made by the Principal	.72*
33	Decisions A Teacher Makes Must Have a Superior's Approval	.61*

n = 14

$p < .05$

The negative correlation for item 27 led to revision of the wording for that item on the final form of the questionnaire. It now reads "school faculty" instead of "staff." The original item 30, which showed no correlation with the subscale total, was replaced by a new item from Mansfield's scale. In Mansfield's study the new item showed a .53 correlation with the original 70 item scale.

Section 3 Teaching Behavior

Section 3 of the form used in the Indianapolis testing contained two examples and 44 items asking the teacher about specific instructional procedures and classroom management practices. The items reflected eight subscales that appeared in the Pupil Rating Scale and the Observer Rating Scale: (1) clarity, (2) enthusiasm, (3) difficulty level, (4) individualization, (5) level of instruction, (6) variety, (7) democracy, and (8) control strategy. All teachers tended to rate themselves rather favorably on all subscales. In addition, it appeared that there was little variance between teachers in their self ratings on each subscale. The correlations between the scales on the Teacher Questionnaire and the corresponding scales of the Pupil Rating Scale and the Observer Rating Scale were generally not significant. For these reasons, Section 3 of the Teacher Questionnaire has been completely re-written.

The new section 3 (items 34-51) parallels the nine dimensions on the new Observer Rating Scale: warmth, enthusiasm, clarity, variety, individualization, feedback, cognitive demand, freedom and on-task activity. For each dimension, the teacher classifies himself by choosing the statement which best describes his teaching behavior. He also chooses a statement which represents his conception of the ideal teacher for his grade level. The new items for this section of the questionnaire seem to have the advantages of providing a direct, explicit self description of teaching and at the same time permitting the teacher to express his value position regarding the dimensions of teaching under study. This section can be scored for the "real" self, the "ideal" self and the discrepancy between "real" and "ideal".

Since this section of the revised instrument was not used in the Indianapolis study, there are no data to report. The field test, however, should provide information on the amount of agreement between the teacher's self report and the report of the external observers. In addition, the field study should provide information about the relationships among the three scores generated by this section of the questionnaire and the other variables in the study.

Section 4, Verbal Facility

Section 4 contains 20 items (52-71) measuring the verbal facility of the teacher. These items are the last twenty items of Coleman's 30 item test of verbal facility. In Coleman's analysis, the verbal skills of the teacher were among the most important teacher traits related to achievement, particularly at the lower grade levels. Only the last twenty items were selected to conserve testing time. Twenty items would seem to provide an adequate measure in view of the mean scores for elementary school

teachers reported by Coleman (1966, p. 132). For the United States, teachers of black children earned a mean score of 20.2 and teachers of white children earned a mean score of 23.4. Generally, elementary teachers were able to accomplish successfully two-thirds of the test items. Dropping the bottom third of the items should provide an adequate discrimination among teachers, with the possible exception of those at the lower extreme of the distribution curve.

The mean score for the seven first grade teachers in Indianapolis on the twenty item test was 12.33, with a standard deviation of 2.58. The mean score for the seven fourth grade teachers was 12.80, with a standard deviation of 1.10.

Correlations with Other Variables

Table 31 presents correlations by grade level between teacher characteristics and achievement measures. The significant correlations among teacher characteristics and achievement occur almost exclusively at the fourth grade level. The length of experience at present school, extent of absences, perception of student effort and perception of student ability are significantly correlated with achievement at the fourth grade level. At the first grade level teacher's age was correlated significantly with mathematics achievement.

The variables included in Section one of the questionnaire are of high interest to school administrators and can be manipulated when staffing schools for special programs or populations. While only a moderate number of these items show a significant relationship with achievement in the Indianapolis study, a sample of teachers drawn from a more heterogeneous population of schools and teachers would provide greater variance in the data and allow more opportunity for hypothesized relationships to emerge.

Table 32 presents the correlations of the index of school climate with selected variables for grade 1. Teachers with high verbal ability scores are granted more autonomy than their colleagues. This may be a result of a selection process. If verbal ability is highly correlated with teaching ability, the more able teachers may expect and receive more autonomy in the schools in which they teach. At the same time it is interesting to note that experience is not significantly correlated with school climate for these first grade teachers.

Reading achievement is higher in the classes where teachers have greater autonomy. The class average on the reading achievement test correlates .63 with the school climate measure. The seven classes tested vary somewhat with respect to race, socioeconomic status, and IQ. Using the individual student as the unit of analysis, reading achievement test scores should be regressed on race, socioeconomic status and IQ in order to determine if school climate does affect reading achievement when these other factors are taken into account.

Table 31

Correlations Between Teacher Traits and Achievement

	Grade 1 (n = 7)		Grade 4 (n = 7)	
TQ	Reading Achievement	Mathematics Achievement	Reading Achievement	Mathematics Achievement
Age	.24	.90**	.08	.13
Degree Held	.23	.15	.54	.50
Experience	.32	.62	.22	.24
Experience-Present School	-.30	.41	.67*	.69*
Absence from Work	-.12	.38	.70*	.69*
Salary	.04	.46	.41	.42
Rating-Student Effort	.24	.35	.69*	.69*
Rating-Student Ability	.39	-.02	.84**	.80*
School Resources	-.80	-.36	.11	.14
Preference-Career	.60	.47	.48	.44
Preference-School	-.29	-.59	-.07	-.02
Problems Perceived	-.08	-.21	.42	.44

* $p < .05$ (one tail test)
** $p < .01$

Table 32

Correlations Between School Climate

and Selected Variables (Grade I)

Variables	Correlation
Teacher Verbal Ability	.83*
Teacher Experience	.11
Student Reading Achievement	.63
Student Attitude Toward School	
School in General	.02
School Work	.11
Teacher	.44
TOTAL	.21

n = 7

*p < .05

Table 33 presents the correlations between school climate and selected variables for grade 4. As was the case with the first grade teachers, verbal ability is highly correlated with school climate. Teaching experience also is highly correlated with school climate for this group of fourth grade teachers. Apparently more experienced teachers and those with higher verbal ability are subject to less centralized authority and are granted more autonomy than their colleagues, a finding that agrees with the findings of Anderson (1968).

Reading achievement shows a correlation of .38 with school climate. Again a regression analysis needs to be performed with individual student data to separate the effect of school climate from the effects of student characteristics.

In summary, the pattern of correlations obtained between the school climate variable and some aspects of teacher background and behavior resulted in a decision to retain the School Climate Scale in the Teacher Questionnaire.

Correlations were computed between teacher's verbal facility and the class mean achievement in reading and arithmetic for seven first grade and five fourth grade classes. Only one significant correlation was obtained (.90 for reading achievement of first graders and teacher's verbal facility). This finding agrees with Coleman's results pointing to the importance of teacher's verbal facility at the lower grade levels.

In its present form, the Teacher Questionnaire collects information about teacher characteristics and background; perceptions of school, students, and organizational climate; self descriptions of real and ideal teaching behavior; and a measure of verbal facility. Indianapolis teachers who received a longer form of this instrument offered no negative comments when specifically queried about the length of the questionnaire and the nature of the items. While some sections of the instrument have not been tried in the revised form, data from the portions which have been tried suggest that the Teacher Questionnaire will provide highly useful information.

Table 33

Correlations Between School Climate and Selected Variables (Grade 4)

Variables	Correlation
Teacher Verbal Ability	.78*
Teacher Experience	.77*
Student Reading Achievement	.38
Student Attitude Toward School	
School in General	.65
School Work	.63
Teacher	.34
TOTAL	.56

n = 7

*p < .05

Teacher Observation Scales

The Teacher Observation Scales include four instruments: Observer Rating Scale, Reading Strategies Check List, Arithmetic Strategies Check List and Classroom Description. These instruments utilize trained observers to describe the teaching behavior, instructional strategies and physical characteristics in each classroom.

Observer Rating Scale

The objective of the Observer Rating Scale is to obtain data on specific teaching behavior. The teaching behaviors selected for study emerge directly from the research literature related to student achievement or reflect expected relationships with the affective outcome variables.

Background

The inclusion of classroom behavior data is a necessary part of research on how education affects children. Many critics have cited the paucity of such information in past research and have urged its inclusion in future studies (Grannis, 1972; Rosenshine, 1972, 1973; Simon and Boyer, 1967; Stake, 1970). There are, however, many reasons for avoiding direct observations of the classroom. Observations are expensive in terms of time, money, and the professional skill demanded for observers (Medley & Mitzel, 1963). There are some educators who feel that the observer in a classroom is an intruder whose presence tends to prevent normal classroom procedure (Lambert, Goodwin, & Roberts, 1965).

Within the last decade there has been growing emphasis on classroom observations, but studies showing relationships between instruction and measures of student growth are meager and many of these studies have gross limitations (Rosenshine, 1971).

> Compared to the large number of descriptive studies, there have been relatively few studies of the relationship between measures obtained by the use of observational systems and measures of class achievement adjusted for initial aptitude or ability (Rosenshine, 1970, p. 293).

However, the study of process variables appears to be a promising source of information concerning teacher-pupil interaction variables and their relationship to outcome variables. Process information such as development of decision-making skills and social adaptation behaviors is only available through study of the relationships within the school environment, in particular, teacher-pupil interaction. These relationships are most effectively studied through observational research. The major rationale for such research is that before one can understand how or why programs have different effects, one has to observe the way in which various educational approaches differ in terms of how children and teachers actually spend their time (Grannis, 1972).

Within the last decade the major area of research on classroom environment has been in the area of teacher-pupil behaviors. The tools to study this relationship have been the various classroom observational instruments which include both category systems and rating systems. Rosenshine differentiates between the two:

> Instruments for the observation of instruction are currently divided into category systems and rating systems. This division is based on the amount of inference required of the observer or the person reading the research report. Inference here refers to the process intervening between the objective data seen or heard and to the coding of those data on an observational instrument. Category systems are classified as low-inference measures (Gage, 1969; Rosenshine, 1970) because the items focus upon specific, denotable, relatively objective behaviors such as 'teacher repetition of student ideas,' or 'teacher asks evaluative questions' and because these events are recorded as frequency counts. Rating systems are classified as high-inference measures because they lack such specificity. Items on rating instruments such as 'clarity of presentation,' 'enthusiasm,' or 'helpful toward students' require that an observer infer these constructs from a series of events. In addition, an observer must infer that frequency of such behavior in order to record whether it occurred 'consistently,' 'sometimes,' or 'never,' or whatever set of gradations are used in the scale of an observation instrument (Rosenshine, 1970, p. 281).

Observation instruments usually focus on cognitive variables. Examples of systems which focus on cognitive variables can be found in the work of Ashner-Gallagher, 1963; Bellack, 1966; Oliver-Shaver, 1963; and Smith, 1967. Affective variables are studied in the systems developed by Anderson and Brewer, 1946; Flanders, 1966; Hough, 1967; Hughes, 1959; Miller, 1966; Moskowitz, 1966; and Spaulding, 1967.

Systems which measure both cognitive and affective components are found in systems developed by Amidon, 1966; Joyce, 1966; Grannis, 1972; Medley, undated; Openshaw-Cypert, 1966, Simon-Agazarian, 1967; Wright-Proctor, 1961; and Stallings, 1972.

Cognitive systems deal with the thinking process itself and consist of categories which differentiate between different kinds of teacher information, teacher questions, or pupil responses. The affective systems deal with the emotional climate of the classroom by coding how the teacher reacts to the feelings, ideas, work efforts or actions of the pupils (Simon & Boyer, 1967).

There has been much less systematic observation of the cognitive aspects of instruction (e.g., the ability to explain new material, use of summary, effectiveness of various types and patterns of questions) than of the affective aspects. A major reason may be that it is difficult to develop a reliable coding scheme because of the problems of context.

The review of literature suggested that the available observation instruments did not provide enough supporting data nor measure the behaviors which were of interest to the present research. Therefore a classroom observation instrument was developed to serve the unique purposes of the study.

Rationale. A decision to use a rating system was made after consultation with Barak Rosenshine and after a thorough study of the literature on the use of category and rating systems. The major reason for this decision was the greater flexibility permitted by rating systems (Rosenshine, 1970) and the possibility of collecting the same type of data from pupils and teachers. The instruments developed for use by the students and teachers are described in detail elsewhere in the report.

Rosenshine's (1973) analysis of correlation studies on teaching behavior and student achievement indicated that nine variables yield the most significant and/or consistent results in studies where naturally occurring behavior was related to measures of student growth. The nine variables are: Clarity, Variability, Enthusiasm, Task-oriented and/or businesslike, Criticism, Teacher indirectness, Student opportunity to learn criterion material, Use of structuring comments, and Multiple levels of questions or cognitive discourse.

In developing a rating scale some of the variables were drawn from this research. Other variables related to the purposes of this particular study were included in the instrument.

Development of Instrument

The original rating scales used for observations in Indianapolis consisted of ten categories of teacher behavior or class characteristics. The ten categories were: climate, democracy, leadership orientation, clarity, enthusiasm, variability, difficulty level of instruction, individualization, use of reinforcement and instructional emphasis.

Preliminary trials of the instruments were conducted with classroom observations in area schools and with video-tapes of four different teachers. The trial observations yielded the following information:

1. A 25-minute observation period is adequate to collect information needed to complete the scale.

2. Inter-judge reliability coefficients (Winer, 1971) obtained from four video tapes of different teachers ranged from .79 to .93.

3. Twenty-five hours of training provided acceptably high agreement with "criterion raters" for six of nine trainees.

Observations were conducted in Indianapolis over a three week period. Six judges observed five first grade teachers and six fourth grade teachers. Observation ratings were made during math and reading instruction only and the unit of observation was a complete lesson. A complete lesson was defined as beginning with the first indication of the introduction of a math or reading lesson and ending with the change to another subject. The length of the observation varied from five to sixty minutes. The observations focused on both verbal and non-verbal behaviors of teachers, students, and interaction between teachers and students.

The correlation matrix for observations made during reading instruction in Indianapolis revealed two clusters of teaching behavior. The first cluster defined by high intercorrelations is composed of climate, enthusiasm and use of reinforcement. These variables suggest a teacher who is warm, enthusiastic and makes good use of verbal feedback. The second cluster is composed of democracy, leadership orientation and individualization of instruction. These variables suggest a teacher who emphasizes independence and freedom, student participation and individualized instruction. These clusters are based on only 11 teachers, but they may indicate that elements of personal style (warmth, enthusiasm) and elements of instructional strategy (student participation, individualization) may be two of the larger components of teaching behavior.

Efforts to obtain agreement between the teachers' descriptions of their own behavior, pupils' descriptions of teaching behavior and ratings of teaching obtained by the external observer were not generally successful. Highest agreement across methods of assessment was obtained between pupil descriptions and observers at the fourth grade level. With an n of 6 classes, significant correlations were obtained for the four scales: clarity, enthusiasm, difficulty level of instruction and individualization.

Finally, examination of the means and standard deviations of the Observer Rating Scales for the 14 teachers studied in Indianapolis revealed relatively homogeneous ratings.

In order to improve sensitivity and reliability, developmental work on the Observer Rating Scale was continued. The scales were rewritten to provide a sharper focus on the unique teaching dimensions and the names of some scales were changed to more adequately reflect these dimensions. In addition, each numerical point on the continuum (1 through 6) describing a dimension of behavior was further specified by brief descriptions of the behavior which would fall at that point. For example, in the earlier form the observer was provided with a definition of "clarity" and asked to place a teacher at one of six points on a scale. In the revised form the observer is provided with the definition of "clarity" and specific examples of behavior for each of the six points on the scale. By anchoring the numerical values of the scale to specific behaviors, it is more likely that all scale positions will be used when appropriate and that greater reliability across observers will be obtained.

The new Observer Rating Scale includes nine dimensions: warmth, enthusiasm, clarity, variety, individualization, feedback, cognitive demand, freedom and on-task activity. These dimensions are described as follows:

1. Warmth. The extent to which the atmosphere of the class is relaxed and comfortable; the degree to which the teacher maintains positive interpersonal relationships with pupils.

2. Enthusiasm. The enthusiasm or interest level expressed by the teacher and students during class activities.

3. Clarity. The clarity of communication, instructions and expectations conveyed to the students.

4. Variety. The extent to which the teacher uses a variety of materials and activities.

5. Individualization. The degree to which the teacher provides students with different levels of work that are suited to their particular needs, interests and abilities, and the amount of individual assistance provided.

6. Feedback. The extent of communication to the student of information about the adequacy, acceptability, completeness or correctness of his response.

7. Cognitive Demand. The level of intellectual activity that the teacher expects from the student.

8. Freedom. The degree to which the teacher provides arrangements which facilitate independence and individual freedom.

9. On-Task Activity. The amount of activity that is directed toward the accomplishment of instructional objectives.

The new observation scales went through a number of successive revisions following classroom observations. As the form approached final revision, it was applied to video-tapes of reading instruction by seven elementary teachers in Battle Ground, Indiana. The video-tapes were rated independently by nine trained observers, all of whom had been active in the development of the scales. The reliability of these observations was computed using analysis of variance procedures to estimate inter-judge reliability (Winer, 1971). The reliability coefficients are presented in Table 34.

The reliability estimates in Table 34 are quite high, with the exception of variety, feedback and cognitive demand. Additional revisions were made in these three scales and refinements were made in the other scales. At this stage, the observation scales appear to be ready for use in the field test. The final form of the Observer Rating Scale is presented in the Appendix.

Table 34

Inter-judge Reliability Coefficients

Observer Rating Scale

(Battle Ground Data)

Dimension	Reliability Coefficient
Warmth	.89
Enthusiasm	.96
Clarity	.89
Variety	.71
Individualization	.96
Feedback	.72
Cognitive Demand	.66
Freedom	.78
On-Task Activity	.84

Reading Strategies Check List

and

Arithmetic Strategies Check List

The critiques of the final report draft recommended that additional information be collected on the instructional strategies used in each classroom. It is possible to record many items of discrete data relevant to instructional methods and materials. Two early forms of a materials and strategies check list were developed and tried in the classroom, but the large amount of detailed recording preempted the observers' time. In addition, it became evident that the smaller bits of data would ultimately have to be combined into more general units which would permit classification of teaching approaches in terms which would have meaning for other teachers and administrators. Following this reasoning, the present check lists were developed for reading and arithmetic instruction. These check lists are intended to provide broad categories which represent the major instructional strategy or teaching mode employed by the teacher.

The seven approaches listed on the Reading Strategies Check List were derived from the classification developed by Matthes (1972): Basal Reading, Language Experience, Individualized, Linguistic, Phonics, Alphabetic and Programmed Instruction. These approaches are described briefly below.

1. Basal Reading Approach. Based on a coordinated series of books which provide a sequential and systematic development of reading proficiency.

2. Language Experience Approach. Uses field trips, class activities and personal experiences to provide the materials for language activities.

3. Individualized Approach. Each child works with reading material selected to fit his interests and reading ability.

4. Linguistic Approach. Emphasizes structural analysis: the use of root words, suffixes, prefixes, and inflectional endings.

5. Phonics Approach. The child is trained in auditory discrimination of individual sounds and in sound-symbol associations.

6. Alphabetic Approach. Utilizes a specially created phonic alphabet of which the best known is ITA.

7. Programmed Instruction Approach. Uses a programmed text or mechanical teaching machine.

The five methods of instruction listed on the Arithmetic Strategies Check List are Expository: Computation; Expository: Concepts/Principles; Discovery; Practice; and Self-study:

1. Expository: Computation. The teacher explains how to use a set procedure, such as adding with three digit numerals.

2. Expository: Concepts/Principles. The teacher explains ideas, concepts or principles.

3. Discovery. The teacher poses problems which the students are to solve by collecting data, using concrete materials, continuing a pattern, or making a generalization.

4. Practice. Students work problems in a supervised study setting.

5. Self-study. The teacher directs students to self-instructional materials and each student works through the materials t at his own pace.

Following observation of reading instruction, the observer indicates on the Reading Strategies Check List which approach received major emphasis and which other approaches were used in a supplementary way. After observation of arithmetic instruction, the observer records on the Arithmetic Strategies Check List the major instructional procedure and the supplementary methods used by the teacher.

Both the Reading and Arithmetic Strategies Check Lists are relatively simple and easy to use, yet they are designed to provide enough information to differentiate among teachers using widely different instructional approaches. The Check Lists also permit ready identification of teachers with an eclectic approach to instruction. The use of these Check Lists in the field test should provide useful information to supplement the data derived from the Observer Rating Scale.

Classroom Description

The Classroom Description was designed to provide descriptive, low-inference information about selected features of the classroom and class composition. It provides a physical description of the classroom environment in terms of seating patterns, adequacy of learning materials and equipment, noise level, displays, lighting, ventilation, heating and space. The Class Description reflects information on the number of adults involved with the class and whether the class structure and method of instruction appear to be traditional, open-concept or experimental. It also provides information on class size and ethnic composition.

An early form of the Classroom Description was used in the Indianapolis observations. This form was revised on the basis of observers' reports of problems with its use. The revised Classroom Description appears in the Appendix.

Observation Procedures

The observer's instructions will specify that he be in the classroom long enough to observe instruction in both reading and arithmetic. In addition, he may see portions of intervening behavior, such as opening exercises, show and tell, or lessons in other subjects. In completing the Observer Rating Scales, he will make use of all of his observations. He will also consider the total observation when completing the Classroom Description. The Reading Strategies Check List will be completed specifically for the reading lesson and the Arithmetic Strategies Check List will be completed specifically for the arithmetic lesson. A training manual designed to develop skill in the use of the observation instruments is on file with the National Center for Educational Statistics and the Purdue Educational Research Center. Four examples of reading instruction in elementary classrooms on 16 mm sound film accompany the training manual. These films are available through the National Center for Educational Statistics or the Purdue Educational Research Center.

Summary

The classroom observation instruments seem to provide data on a reasonably broad spectrum of instructional practices. The observation scales provide for aspects of teaching style and technique emerging from the research literature and relevant to the dependent variables of the study. The Reading and Arithmetic Strategies Check Lists permit classification of teachers according to their instructional procedures. The Classroom Description takes account of physical facilities, class composition, and organizational and management patterns. In combination, these instruments capture major dimensions of teaching behavior and class structure. These dimensions play a prominent role in that portion of the study dealing with the teacher's impact on the cognitive and affective outcomes.

Data Processing Procedures

The organization of data files will be an important part of the longitudinal study. While the nature and number of variables to be included has changed somewhat since the preliminary trials in Indianapolis, nevertheless the record of data processing used in the Indianapolis study may be useful.

All data collected during the Indianapolis testing were recorded on IBM cards and submitted to machine processing. This portion of the report provides a record of the procedures employed together with the card formats of the basic data files.

Data collected on first grade students, fourth grade students, and teachers were processed separately. Each student was assigned a 6 digit ID number, indicating school, grade, teacher, and student number. Teachers were assigned 4 digit ID numbers, representing school, grade and teacher number.

Table 35 shows the data processing procedure for each instrument. All tests and questionnaires were initially scanned for errors. Tests were discarded if 10% of the items were omitted or if an obvious pattern of responding was detected. Most of the tests given to fourth grade students were collected on mark sense or op scan sheets and machine scored.

All data that were collected on specially designed answer sheets had to be either hand scored, transferred to mark sense cards, or keypunched for initial scoring. Test data on students were transferred to mark sense cards. Teacher Questionnaire I was hand scored since that information was needed promptly for the selection of teachers. Parent Questionnaires and class observations were coded, keypunched and programmed for scoring.

All data were analyzed using computer routines from the Statistical Package for the Social Sciences (SPSS). The following pages provide a record of card format for the two major files: teacher file and student file. Differences between the fourth grade and first grade files are noted when necessary.

Table 35

Data Processing

Instrument	Type of Answer Sheet				Scoring Procedure			
	Error Scan	Mark Sense	Op Scan	Special Design	Hand Score	Transfer to Mark Sense	Coded for Computer Scoring	Machine Scored
Class Roster	X			X	X			
Ravens (G1)	X			X	X			
(G4)	X			X	X			
Pupil Rating Scale (G1)	X			X		X		X
(G4)	X	X						X
Attitude (G1)	X			X		X		X
(G4)	X		X					X
Self Concept (G1)	X			X		X		X
(G4)	X		X					X
Pupil Information Booklet (G1)	X			X			X	
(G4)	X			X			X	
Peer Rating Scale (G1)	X			X			X	
(G4)	X			X			X	
Parent Questionnaire (Short)	X			X			X	
Parent Questionnaire (Long)	X			X			X	
Teacher Questionnaire 1	X			X	X			
Observation	X			X			X	
Teacher Questionnaire 2	X	X						X

Student Card #1

Col. #	Format	Coding	Label
1	F1.0	School	SCHOOL
2	F1.0	Grade	GRADE
3-4	F2.0	Teacher	TEACHR
5-6	F2.0	Student	STUDNT
7	F1.0	Sex (1 = Girl, 2 = Boy)	SEX
8	F1.0	Race (1 = Black, 2 = White, 3 = Other)	RACE
9	F1.0	SES (1 = Lower, 2 = Middle, 3 = Upper)	SES
10-11	F2.0	Age (Years)	AGE
12-13	F2.0	Age (Months)	AGE
14	F1.0	Handicapped Mentally 1 = ✓	HMENT
15	F1.0	" Physical 1 = ✓	HPHYS
16	F1.0	" Speech 1 = ✓	HSPCH
17	F1.0	" Hearing 1 = ✓	HHEAR
18	F1.0	" Visually 1 = ✓	HVIS
19	F1.0	Talented Academic 1 = ✓	TACA
20	F1.0	" Musical 1 = ✓	TMUS
21	F1.0	" Artistic 1 = ✓	TART
26-27	F2.0	Raven's Total Score	RAVENS
42-43	F2.0	Reading Achievement (total raw score)	REACH
44-45	F2.0	Math Achievement (total raw score)	MATHACH
46-47	F2.1	Word Knowledge G.E.	WDKNOW
48-49	F2.1	Word Analysis G.E. (1st only)	WDANAL
50-51	F2.1	Reading G.E.	READGE
52-53	F2.1	Math Comprehension G.E. (4th grade cards only)	MATHCOM
54-55	F2.1	Math Concepts G.E. (4th grade cards only)	MATHCPT
56-57	F2.1	Math Problems G.E. (4th grade cards only)	MATHPBM
60-61	F2.0	PUpil Rating Scale Total	PURTOT
62-63	F2.0	PUpil Rating Scale Subscale 1	PURA
64-65	F2.0	PUpil Rating Scale Subscale 2	PURB
80	F1.0	Card 1	1

Student Card #2

Col. #	Format	Coding	Label
1	F1.0	School	
2	F1.0	Grade	
3-4	F2.0	Teacher	
5-6	F2.0	Student	
9-10	F2.0	Attitude - 1 School in General	ATTSCH
13-14	F.20	Attitude - 2 School Work	ATTSW
17-18	F2.)	Attitude - 3 Teacher	ATTTCH
20-22	F3.0	Attitude - total	ATTTOT
24-25	F2.0	Self Concept - 1 Feeling Self	SCFEEL
26-27	F2.0	Self Concept - 2 School Self	SCSCH
28-29	F2.0	Self Concept - 3 Behaving Self	SCBEH
30-31	F2.0	Self Concept - 4 Social Self	SCSOC
		(total for 1st grade)	SCTOT
32-33	F2.0	Self Concept - 5 Body Self (4th only)	SCBODY
34-35	F2.0	total (4th only	SCTOT
37-38	F2.0	Pupil Information B. Leadership	PIB1
39-40	F2.0	" Independence	PIB2
41-42	F2.0	" Assertiveness	PIB3
43-44	F2.0	" Competitiveness	PIB4
45-46	F2.0	" Subscale I	PIBA
47-48	F2.0	" Cooperation	PIB5
49-50	F2.0	" Conformity	PIB6
51-52	F2.0	" Authority Relations	PIB7
53-54	F2.0	" Control of Aggression	PIB8
55-56	F2.0	" Subscale II	PIBB
57-58	F2.0	" Liking Others	PIB9
59-60	F2.0	" Being Liked	PIB10
61-62	F2.0	" Subscale III	PIBC
63-65	F3.0	" Total	PIBTOT
80	F1.0	Card 2	2

Student Card #3

Col. #	Format	Coding		Label
1	F1.0	School		
2	F1.0	Grade		
3-4	F2.0	Teacher		
5-6	F2.0	Student		
8-10	F3.2	Peer Rating	- Leadership	PR1
11-13	F3.2	"	- Independence	PR2
14-16	F3.2	"	- Assertiveness	PR3
17-19	F3.2	"	- Competitiveness	PR4
20-22	F3.2	"	- Cooperation	PR5
23-25	F3.2	"	- Conformity	PR6
26-28	F3.2	"	- Authority Relations	PR7
29-31	F3.2	"	- Aggression	PR8
32-34	F3.2	"	- Liking Others	PR9
35-37	F3.2	"	- Being Liked	PR10
38-40	F3.2	"	- Popularity	PR11
41-43	F3.2	"	- Social Acceptance	PR12
44-46	F3.2	"	- Individual Action	PRA
47-49	F3.2	"	- Social Interaction	PRB
50-52	F3.2	"	- Affective Relations	PRC
53-55	F3.2	"	- Total	PRTOT
80	F1.0	Card 3		3

Student Card #4

Col. #	Format	Coding		Label
1	F1.0	School		
2	F1.0	Grade		
3-4	F2.0	Teacher		
5-6	F2.0	Student		
7	F1.0	Parent Quest. (Short)	Head Start	PRESH1
8	F1.0	"	Kindergarten	PRESH2
9	F1.0	"	Day Care	PRESH3
10	F1.0	"	No Preschool	PRESH4
11	F1.0	"	Preschool	PRESH5
12-13	F2.0	"	Achievement Motivation	ACHMOT
14-15	F2.0	"	Independence	INDEP
16-17	F2.0	"	Independence	INDE2
18-19	F2.0	"	Emotional relationship w/child	EMOREL
20-21	F2.0	"	Strict Parental Control	STPRCO
22-23	F2.0	Parent Quest. (Long)	Aspiration	ASPIR
24-25	F2.0	"	Learning Environment	LRNENV
26-27	F2.0	"	Concern for Education	CRNED
28-29	F2.0	"	Maturity Demand	MATDEM
30-31	F2.0	"	TV Quantity	TVQUAN
32-33	F2.0	"	TV Quality	TVQUAL
34-35	F2.0	"	Activities of Parents	ACTPAR
36-37	F2.0	"	Resignation	RESIG
38-39	F2.0	"	Futility	FUTILE
40-41	F2.0	"	Conservatism	CONSER
42-43	F2.0	"	Acceptance	ACCEPT
44-45	F2.0	"	Permissiveness	PERMIS
46-47	F2.0	"	Restrictiveness	RESTRC
48-49	F2.0	"	Nonconformity	NONCON
50-51	F2.0	"	Authority	AUTHOR
52-53	F1.0	"	Birth Order	BIRORD
54-55	F1.0	"	Preschool	PRESCH
80	F1.0		Card 4	4

Teacher Card #1

Col. #	Format	Coding	Label
1	F1.0	School	SCHOOL
2	F1.0	Grade	GRADE
3-4	F2.0	Teacher	TEACHR
11-12	F2.0	Teacher Questionnaire 1	TQ 1
13-15	F3.2	PUpil Rating Scale - 1 Clarity	PUR1
16-18	F3.2	" - 2 Enthusiasm	PUR2
19-21	F3.2	" - 3 Difficulty level	PUR3
22-24	F3.2	" - 4 Individualization	PUR4
25-27	F3.2	" - 5 Level of Instruction	PUR5
28-30	F3.2	" - 6 Variety	PUR6
31-33	F3.2	" - 7 Democracy	PUR7
34-36	F3.2	" - 8 Control	PUR8
37-40	F4.2	" - Total	PURTOT
41-44	F4.2	" Subscale 1 (1-6)	PURA
45-58	F4.2	" Subscale 2 (7,8)	PURB
49-50	F2.0	Teacher Questionnaire 2 - 1 Clarity	TQ21
51-52	F2.0	" - 2 Enthusiasm	TQ22
53-54	F2.0	" - 3 Difficulty level	TQ23
55-56	F2.0	" - 4 Individualization	TQ24
57-58	F2.0	" - 5 Level of Instruction	TQ25
59-60	F2.0	" - 6 Variety	TQ26
61-62	F2.0	" - 7 Democracy	TQ27
63-64	F2.0	" - 8 Control	TQ28
65-66	F2.0	" - 9 School Climate	TQ29
67-69	F3.0	" - Total	TQ2TOT
70-72	F3.0	" Subscale 1 (1-6)	TQ2A
73-74	F2.0	" Subscale 2 (7,8)	TQ2B
80	F1.0	Card 1	1

Teacher Card #2

Col. #	Format	Coding		Label
1	F1.0	School		
2	F1.0	Grade		
3-4	F2.0	Teacher		
7-8	F2.1	Observation (Reading)	- 1 Warmth	OR1
9-10	F2.1	"	- 2 Democracy	OR2
11-12	F2.1	"	- 3 Student participation	OR3
13-14	F2.1	"	- 4 Clarity	OR4
15-16	F2.1	"	- 5 Enthusiasm	OR5
17-18	F2.1	"	- 6 Variety	OR6
19-20	F2.1	"	- 7 Difficulty level	OR7
21-22	F2.1	"	- 8 Individualization	OR8
23-24	F2.1	"	- 9 Reinforcement	OR9
25-26	F2.1	"	-10 Instructional emphasis	OR10
27-29	F3.1	"	- Total	ORTOT
30-32	F3.1	"	- Subscale 1 (1,2,3,9)	ORB
33-35	F3.1	"	- Subscale 2 (4,5,6,7,8,10)	ORA
36-37	F2.1	Observation (Math)	- 1 Warmth	OA1
38-39	F2.1	"	- 2 Democracy	OA2
40-41	F2.1	"	- 3 Student participation	OA3
42-43	F2.1	"	- 4 Clarity	OA4
44-45	F2.1	"	- 5 Enthusiasm	OA5
46-57	F2.1	"	- 6 Variety	OA6
48-49	F2.1	"	- 7 Difficulty Level	OA7
50-51	F2.1	"	- 8 Individualization	OA8
52-53	F2.1	"	- 9 Reinforcement	OA9
54-55	F2.1	"	-10 Instructional emphasis	OA10
56-58	F3.1	"	- Total	OATOT
59-61	F3.1	"	- Subscale 1 (1,2,3,9)	OAB
62-64	F3.1	"	- Subscale 2 (4,5,6,7,8,10)	OAA
65	F1.0	Teacher Questionnaire	2- Age	TQ2AGE
66	F1.0	"	Degree	TQ2DEG
67	F1.0	"	Experience	TQ2EXP
68	F1.0	"	Experience (same school)	TQ2EXS

Teacher Card #2 (continued)

Col. #	Format	Coding		Label
69	F1.0	Teacher Questionnaire 2	Absence	TQ2ABS
70	F1.0	"	Salary	TQ2SRY
71	F1.0	"	St. effort	TQ2STE
72	F1.0	"	St. ability	TQ2STA
73	F1.0	"	Resources	TQ2RES
74	F1.0	"	Career	TQ2CAR
75	F1.0	"	School choice	TQ2SC
76	F1.0	"	Problems	TQ2PR
77-78	F2.0	"	Verbal facility	TQ2VF
80	F1.0	Card 2		2

Teacher Card #3

Col. #	Format	Coding	Label
1	F1.0	School	
2	F1.0	Grade	
3-4	F2.0	Teacher	
5-8	F4.2	Ravens	RAVENS
9-12	F4.2	Reading Achievement	REACH
13-16	F4.2	Math Achievement	MATHACH
17-18	F2.1	Word Knowledge G. E.	WDKNOW
19-20	F2.1	Word Analysis G.E.	WDANAL
21-22	F2.1	Reading G.E.	REAGE
23-24	F2.1	Math Comprehension G.E. (4th only)	MATHCOM
25-26	F2.1	Math Concepts G. E. (4th only)	MATHCPT
27-28	F2.1	Math Problems G.E. (4th only)	MATHPBM
29-32	F4.2	Attitude - School in General	ATTSCH
33-36	F4.2	Attitude - School Work	ATTSW
37-40	F4.2	Attitude - Teacher	ATTTCH
41-44	F4.2	Attitude - Total (1st only)	ATTTOT
	F4.1	Attitude - Total (4th only)	ATTTOT
45-48	F4.2	Self Concept - Feeling Self	SCFEEL
49-52	F4.2	Self Concept-School Self	SCSCH
53-56	F4.2	Self Concept - Behaving Self	SCBEH
57-60	F4.2	Self Concept - Social Self (4th only)	SCSOC
		" Total (1st grade)	SCTOT
61-64	F4.2	Self Concept - Body Self (4th only)	SCBODY
65-68	F4.2	Self Concept - Total (4th only)	SCTOT
69-71	F3.2	Peer Rating - Leadership	PR1
72-74	F3.2	" - Independence	PR2
75-77	F3.2	" - Assertiveness	PR3
80	F1.0	Card #3	3

Teacher Card #4

Col. #	Format	Coding		Label
1	F1.0	School		
2	F1.0	Grade		
3-4	F2.0	Teacher		
5-7	F3.2	Peer Rating	- Competitiveness	PR4
8-10	F 3.2	"	- Cooperation	PR5
11-13	F3.2	"	- Conformity	PR6
14-16	F3.2	"	- Authority Relations	PR7
17-19	F3.2	"	- Aggression	PR8
20-22	F3.2	"	- Liking Others	PR9
23-25	F3.2	"	- Being Liked	PR10
26-28	F3.2	"	- Popularity	PR11
29-31	F3.2	"	- Social Acceptance	PR12
32-34	F3.2	"	- Individual Action	PRA
35-37	F3.2	"	- Social Interaction	PRB
38-40	F3.2	"	- Affective Relations	PRC
41-43	F3.2	"	Total	PRTOT
80	F1.0	Card #4		4

Specifications for a Field Test

The long range plans for a nationwide longitudinal study of elementary school effects include three distinct operations: (1) the design and instrumentation of the study, (2) a field test, and (3) the comprehensive national study. The field test would reveal any major problems in the organization and conduct of the study before large sums of money are committed and the full scale organizational and operational teams are assembled. The field test should be large enough to check the major components of the design, to determine the adequacy of the instruments, and to obtain information on any unresolved issues in the conduct of the study.

Systems Check

A primary function of the field test is to provide a dress rehersal for the national study. As such, the field test should provide checks on the adequacy of the systems on which the study depends: instrumentation, personnel, data management and logistics. The requirements of each of these systems is examined separately:

1. Instrumentation. The tests and questionnaires designed to gather data for this study will be applied to individuals from widely divergent socioeconomic and ethnic backgrounds.

   While all instruments have undergone preliminary trials, they have not been tried on a large number of subjects with diverse backgrounds and under a variety of conditions. The field test will provide enough experience, particularly with children and adults of inner city areas, to determine that vocabulary and directions are understandable and sufficiently clear so that the respondent is well oriented to and fully comprehends the task he is to perform.

   Since many of the instruments may be administered by individuals without professional training, the field test will make provisions for monitoring the administration of all instruments to be sure that administrative procedures, interpretations of directions, and responses to inquiries are sufficiently similar so that comparable data are being collected at each administration.

   The overall goal of the field tests with respect to the instruments is to identify and make recommendations about any aspects of the data collecting forms or procedures which would be troublesome in the full scale national study. These recommendations are to be incorporated in the final revisions of tests, questionnaires, directions and administrative manuals.

2. Staff Organization. The field test will serve to try out the organizational plan and personnel needs at one data collection site. The site will be the responsibility of a full time site manager who will recruit and train a staff to execute the sampling plan, obtain cooperation of the schools, arrange for data collection, and trace

migrating children. The site manager will work through two team leaders who will help train and supervise test administrators, classroom observers and home interviewers. Specific estimates of field test personnel needs for a site are presented on a later page. The field test will empirically check the time estimates established for each task and confirm the plans for organization, training and monitoring site personnel.

The site manager will report to a project director who will be responsible for the logistics of the study including printing and distribution of instruments to the site, and for the data management system.

3. Logistic System. The plan for bringing together the materials and people at the appropriate time to accomplish the study is presented in the Field Test Calendar. The calender lists activities and target dates associated with staffing, sampling, arrangements for participation, training, materials, data collection and analysis. The field test will help determine whether the plans facilitate an orderly development of the projects and allow time to cushion unforseen delays. In addition, the field test will allow for the development of routine communication instruments between the project director and site managers to be used in confirming responsibilities and pacing activities during the national study.

4. Data Management System. This system governs the flow of data from the sites through the scoring operations and computational procedures leading to analysis and interpretation. The large amount of data that will ultimately be generated by the national study suggests that step by step operations of this system be established during the field test so that accuracy and accessability of the data will be maintained. For this purpose, the project director of the field test will have available to him test scoring services, data processing equipment, and the continuing assistance of a systems analyst and a statistician trained in multivariate analysis. With their assistance, the project director will define data management procedures including the following operations.

   (a) Establishment of flow charts specifying machine scoring and data processing of all answer sheets and data collecting forms.

   (b) Establishment and checking of all data files relevant to the study.

(c) Establishment of standard statistical programs or special programs needed to perform the statistical analysis described in the analysis plan.

The procedures governing test scoring, data reduction, machine processing, and statistical analysis should be sufficiently refined and documented during the field trial so that the data from the national study can be handled directly by the resulting programs.

Unresolved Issues

The developmental work to date, including the trials in Indianapolis, leaves a number of unresolved problems and issues:

1. How can the arrangements for small group testing at the primary grades be handled?

2. How can decisions be made about which teacher to observe in situations where the pupil has a number of specialized teaching arrangements?

3. Do the advantages of multimethod measurement of critical variables outweigh the disadvantages of increased cost and testing time?

4. Will the procedures proposed for tracking migrating children be adequate for the task?

5. Is there a need to measure additional variables related to characteristics of particular schools and instructional programs?

This section elaborates each of these issues and presents plans for a field test which should provide data relevant to alternative approaches to each of these problems.

The field test will be conducted at a single site as previously defined. The sample will contain twelve schools and a total of 36 classrooms at each grade level, one through six. Thus about 1080 children per grade level will be tested and a total of approximately 6,480 children will be involved in the field test. The design of the field test, sampling procedures, data gathering plan, testing sequence, selection of cohorts and tracing of migrating children will in all respects be a replica of the proposed national study.

The data from the field test will help determine the feasibility of the national study, permit detection of problems in the operating procedures and provide information which will be helpful in resolving the problems in the design of the study. Each of the unresolved problems is examined in greater detail below:

1. Whole class versus small group testing. The Indianapolis testing revealed a high degree of distractibility, lapses of attention and sharing answers among children in the primary grades. The proposed solution, testing in groups of eight to ten pupils in grades one through three, creates two new problems:

   a. Dividing the class into thirds requires two extra rooms which may be difficult to schedule, if they exist at all.

   b. Additional personnel are required for the additional testing rooms.

   The field test will specify testing of classes in thirds in grades 1 through 3 and will request documentation of the arrangements worked out in local situations which facilitate this procedure, special difficulties encountered, and recommendations regarding the feasibility of small group testing for the national study. Estimates of personnel needs and costs reflect the additional personnel required for small group testing.

2. Multiple Teachers. A major concern of the study is the examination of the impact of teaching behavior on achievement and affective outcomes. In many elementary schools, however, students no longer have "a teacher", but several. The dilemma has been handled thus far by limiting observations to reading and arithmetic instructional sessions. Even within reading, however, some students may receive reading instruction in class and supplementary instruction in tutorial sessions or other special arrangements. Tracing reading achievement to specific teaching behaviors under these conditions seems to be almost impossible. In addition, there is a question of which teacher or teachers should be completing the questionnaires and pupil information booklets; and to what extent external observers should attempt to include specialized or supplementary teachers in their observations. To help define this problem with greater precision, the specifications for the field test will request information on the extent of multiple teaching patterns in the schools in the field test including (1) proportion of children involved in such teaching arrangements, (2) particular instructional areas in which this practice is common, and (3) whether such practices are most prevelant for special groups, i.e., slow learners, Title I schools, etc.

   The Class Roster provides space for designating which of several teaching arrangements apply to reading instruction and arithmetic instruction. The specifications for field testing will include observations of all types of reading instruction including duplicate observations in situations involving multiple teachers. Because of cost factors duplicate observations will not be extended to arithmetic or other areas of instruction. Neither will additional

pupil ratings or teacher questionnaires be collected for supplementary teachers.

3. Multimethod Approaches. Preliminary work in the design and instrumentation of the study has included multimethod approaches to measuring critical variables. It would seem desirable to reduce the testing burden imposed on the schools prior to embarking on the national survey. Application of the statistical analysis plan should afford a basis for recommendations regarding elimination, revision or consolidation of instruments and such recommendations will be requested.

4. Tracing Migrating Children. Two primary aids are established for tracing migrating children: flagging study children's school folders and obtaining from parents the name of a close friend or relative through which parents can be reached. In some cases, however, parents will not have completed the questionnaire or students may move without requesting that school records be forwarded. During the field study, the proportion of migrating children designated for follow-up who are successfully located through the methods proposed will be recorded, and additional procedures used for locating migrating children will be listed along with the cost of such procedures.

5. Coverage of Variables. One of the major tasks of this phase of the design of the study has been the reduction of the number of variables to a manageable size. Current plans obtain only limited information about the extent or nature of the child's curriculum, instructional program, or materials. Thus, the field test will include a request to the home-room teacher to provide a calendar of the child's activities during a typical week, showing the number of hours of each day devoted to each activity, how that activity is organized, and the specific text book series or other instructional material used. The field test will determine whether such information can be consolidated and entered into the analysis as control variables.

Personnel Requirements

In order to conduct a field test of the scope indicated in the body of the report, a project director and his staff and a site manager and supporting staff will be needed. The project director will work beyond the data collecting period to analyze the data and develop the final report and recommendations. The site manager will recruit additional personnel to serve as test administrators, classroom observers and home interviewers. These personnel will function under two team leaders, each responsible for 6 schools in the study.

For planning purposes, test sessions of minimum length will be specified:

	Session Number	Test	Time in Minutes
Fall	1	Attitude Toward School	20
	2	Self-Concept	40
	3	Clymer-Barrett Prereading Battery Part A	18
	4	Clymer-Barrett Prereading Battery Part B	15
	5	Stanford Early School Achievement Test (Math)	20
	6	Purdue Elementary Problem-Solving Inventory	40
	7	Purdue Concept Formation Test - Conservation	40
	8	Raven's Coloured Progressive Matrices	30
	9	Peer Ratings	40
Spring	10	Attitude Toward School	20
	11	Self-Concept	40
		Stanford Achievement Test	
	12	Reading Vocabulary	20
	13	Reading Comprehension, Part A	20
	14	Reading Comprehension, Part B	20
	15	Arithmetic Concepts	25
	16	Arithmetic Computation	30
	17	Purdue Elementary Problem-Solving Inventory	40
	18	Purdue Concept Formation Test - Conservation	40
	19	Pupil Description of Teaching	30
	20	Peer Ratings	40

The above schedule for first grade testing can serve as a model for the upper grades. At the upper grades, the fall achievement testing will have more sessions than shown, but some of the shorter sessions can be combined for the older children.

The above tabulation indicates that planning can be based on approximately 20 separate sessions at each grade level. Since the primary grade children will be separated into thirds to facilitate small group testing, the number of testing sessions required must be multiplied by 3 for the primary grades (1-3).

Using these figures, the total number of testing sessions for the field test can be calculated.

Grades 4-6

36 classes per grade
x3 grades
108 classes
x20 testing sessions per class
2160 testing sessions grades 4-6

Grades 1-3

36 classes per grade
x3 grades
108 classes
x3 subgroups per class
324 subgroups, grades 1-3
x20 test sessions
6480 testing sessions grades 1-3

Total: 2160 grades 4-6
6480 grades 1-3
8640 testing sessions, grades 1-6

Assuming that a trained examiner can conduct 3 testing sessions in a half day, then 8,640 divided by 3 provides an estimate of 2,880 half days or 1,440 days of test administration time required. To accomplish the testing within the time period, 144 test administrators would be needed for a total of 10 days plus 3 days training, 1 day for clean up, and 1 day for tracing and testing migrating children.

Estimates for classroom observers are based on a ratio of one observer per grade level for each 3 schools. Each observer would observe 9 classes 3 times for a total of 27 observations per observer. Training needs are estimated at 5 days for each observer.

The number of home interviewers needed assumes 25% non-returns on questionnaires, requiring personal contact for 1620 parents. Assuming 40 interviewers making 4 contacts a day over a 10 day period, plus one day for training, produces an estimate of the manpower needs for home interviews.

The following estimates are offered for personnel needs to accomplish the major tasks of the study:

Project Director and Staff

1. Project Director, Full time, 16 months (July 1 of first year to October 31 of second year)
2. Administrative Assistant, Full time, 16 months
3. Secretary, Full time, 16 months
4. Clerical assistants, 5,000 hours
5. Computer Programmer/system analysts, 25%, 10 months
6. Statistical consultants, 32 days

Site Manager and Staff

1. Site Manager, Full time, 12 months
2. Team Leaders, Full time, 10 months (2)
3. Secretary, Full time, 12 months
4. Test Administrators, 144 for 15 days each, training included.
5. Classroom Observers, 24 for 15 days each plus 5 days of training.
6. Home interviewers, 40 for 10 days each plus one day of training.
7. Training Personnel (for classroom observers), 20 man days.

Field Test Calendar

		Year One
1.	Select site for field test	Aug. 1
2.	Select site manager	Aug. 1
3.	Select schools for field test	Aug. 15
4.	Site manager selects 2 staff members	Aug. 20
5.	Site manager contacts principals	Aug. 25
6.	Fall testing materials warehoused	Aug. 1
7.	Classroom test packages assembled and delivered to site manager	Aug. 15
8.	Class rosters collected by site staff	Sept. 13
9.	Fall testing materials delivered to teachers	Sept. 6
10.	Training program for teachers planned	Sept. 1
11.	Teachers trained for fall test administration	Sept. 14
12.	Fall testing administered	Sept. 23-Oct. 18
13.	Test administration monitored to debug instrument directions and training program.	Sept. 23-Oct. 18
14.	All testing materials picked up by site staff	Oct. 18
15.	All answer cards/sheets checked and all necessary coding inserted by site staff and delivered to project director	Oct. 31
16.	Subsamples from each class roster selected by site staff	Dec. 15
17.	Materials for winter data collection warehoused	Oct. 15
18.	Winter data collection materials delivered to site manager	Dec. 15
19.	Parent Questionnaires sent home on or before	Jan. 15
20.	Winter data collection monitored to debug instrument directions and training program	Jan. 15-Feb. 28
21.	Answer cards/sheets from winter testing prepared by site staff	Feb. 20
22.	Teacher Questionnaires completed on or before	Feb. 28
23.	Pupil information booklet completed on or before	Feb. 28
24.	Recruit and train parent interviewers	Feb. 1-7
25.	Home interviews conducted	Feb. 7-28
26.	Classroom observers recruited	Jan. 15
27.	Classroom observers training planned	Jan. 1
28.	Classroom observer training program	Feb. 1-7
29.	Classroom observations	Feb. 10-Mar. 10
30.	Monitoring of classroom observers to debug observation scales and observer training	Feb. 10-Mar. 10

31.	Spring testing materials ordered or produced	Dec. 1
32.	Spring testing materials warehoused	Feb. 1
33.	Spring testing materials packaged and delivered to site manager	Mar. 1
34.	Training program for teachers planned	Mar. 1
35.	Spring testing materials delivered to teachers	Mar. 10
36.	Teachers trained for spring test administration	Mar. 12
37.	Spring testing administered	Mar. 15-Apr. 9
38.	Monitoring of spring test administration to debug instrument directions and training program	Mar. 15-Apr. 9
39.	Sample of migrating children traced and tested	Mar. 1-Apr. 1
40.	All testing materials picked up by site staff	Apr. 15
41.	Site staff disbanded	May 3
42.	Data analysis	May 1 -June 30

Year Two

43.	Final Report of Field Test including specs for study	Nov. 1
44.	Selection of sites for Fall, data collection	Mar. 15
45.	Selection of samples within sites for Fall, 1976	May 1
46.	All materials for Fall, testing ordered or produced	June 1

Summary

The field test will be carried out in all respects as indicated by the design of the study except that data gathering will be confined to a single site. During the field test information related to several design issues will be generated and the major systems of the study will be debugged and further elaborated. The products of the field study will include information helpful in the final design of the national study, final revisions of instruments and test administrators directions, instructions and directions for survey team leaders, a site manager's manual, guides for the project director, and procedures for data processing and analysis. Cost estimates for conducting the field study have been submitted to USOE.

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Test Publishers

Raven's Coloured Progressive Matrices
Psychological Corporation
304 East 45th Street
New York, N.Y. 10017

Clymer-Barrett Prereading Battery
Personnel Press, Inc.
20 Nassau St.
Princeton, N. J. 08540

Stanford Early School Achievement Test (mathematics) and
Stanford Achievement Tests, 1973 edition (Reading and Mathematics)
Harcourt, Brace, Jovanovich, Inc.
757 Third Ave.
New York, N. Y. 10017

Appendix

Variables

Dependent Variables

Achievement	
Reading Readiness	Clymer-Barrett Prereading Battery (Short Form)
Recognition of Letters	" " " "
Discrimination of Beginning Sounds	" " " "
Reading Achievement	Stanford Achievement Tests (1973 Edition)
Vocabulary	" " "
Reading Comp. Part A	" " "
Reading Comp. Part B	" " "
Arithmetic Achievement	
Mathematics (Readiness)	Stanford Early School Achievement Test
Concepts	Stanford Achievement Tests (1973 Edition)
Computation	" " "
Cognitive	
Problem Solving	Purdue Elementary Problem-Solving Inventory
Conservation	Purdue Concept Formation Test - Conservation
Affective	
Attitude Toward School	Attitude Toward School
School In General	" " "
Schoolwork	" " "
Teacher	" " "
Total	" " "
Self-Concept	Piers-Harris Self-Concept Scale; Self Concept Scale for Primary Grades (adapted from Piers-Harris)
Feeling Self	"
School Self	"
Behaving Self	"
Social Self	"
Body Self	"
Total Self-Concept	"
Personal-Social Development	
Leadership	Peer Ratings of Personal-Social Development
Independence	" " " " "
Assertiveness	" " " " "
Competitiveness	" " " " "
Cooperation	" " " " "
Conformity	" " " " "
Authority Relations	" " " " "
Aggression	" " " " "
Liking Others	" " " " "
Being Liked	" " " " "
Popularity	" " " " "
Social Acceptance	" " " " "
Sub-Scale 1-Individual Action	" " " "
Sub-Scale 2-Social Interaction	" " " "
Sub-Scale 3-Affective Relations	" " " "
Total Peer Rating	" " " "

Independent Variables

School Organizational Climate	Teacher Questionnaire
Teaching Behavior	
Warmth	Observer Rating Scale, Teacher Questionnaire, Pupil Description of Teaching
Enthusiasm	
Clarity	"
Variety	"
Individualization	"
Feedback	"
Cognitive Demand	"
Freedom	"
On-task Activity	"
Total	"
Teacher Traits	Teacher Questionnaire
Sex	"
Race	"
Age	"
Highest Degree Earned	"
Years of Experience	"
Years in Present School	"
Days Absent from Work	"
Annual Salary	"
Length of Time Teaching Current Class	"
Perception of Student Effort	"
Perception of Student Ability	"
Adequacy of Teaching Resources	"
Career Satisfaction	"
Satisfaction with Present School Placement	"
Number of Problems Perceived	"
Verbal Facility	"
Home and Family Background	Parent Questionnaire; Parent Interview Schedule
Parental Aspiration for Child	"
Learning Environment	"
Concern for Education	"
Maturity Demand	"
Quantity of TV	"
Parental Restriction of TV	"
Activities of Parents	"
Parental Attitude Toward Education	"
Resignation	"
Futility	"
Conservatism	"
Acceptance of Child	"
Permissiveness	"
Restrictiveness	"
Parent's Authoritarian Attitudes	"

Control Variables

General Ability	Raven's Coloured Progressive Matrices
Child's School	Class Roster
Child's Grade	" "
Child's Teacher	" "
Sex	" "
Race	" "
Estimate of Socioeconomic Status	" "
Birthdate	" "
Special Handicaps	" "
Mental	" "
Physical	" "
Speech	" "
Hearing	" "
Visual	" "
Special Reading Program	" "
Special Math Program	" "
Marital Status of Parents	Parent Questionnaire, Parent Interview Schedule
Socioeconomic Status	"
Education of Mother	"
Education of Father	"
Age of Mother	"
Age of Father	"
Extent of English Usage in Home	"
Foreign Language Spoken in Home	"
Number of Siblings	"
Enrollment in Pre-school Programs	"
Academic Emphasis of Pre-school Programs	"
Pre-school Viewing of Sesame Street	"
Current Viewing of the Electric Company	"

Additional Variables for Cohorts

Demographic	
Month Student Entered Class	Pupil Information Booklet
Difficulty Speaking English	" " "
Approximate Family Income	" " "
Type of Homeroom Class	" " "
Grade Equivalent for Multilevel Class	" " "
Failed a Grade at least once	" " "
Skipped a Grade at least once	" " "

Additional Variables for Cohorts (continued)

Demographic (continued	
Persistent Problems	Pupil Information Booklet
Low Achievement	
Vision	
Hearing	
Speech Defects	
Physical Handicaps	
Chronic Disease or Illness	
Mental Retardation	
Learning Disability	
Emotional Problems	
Social Handicap	
Malnutrition	
None of the Above	
Special Talents	Pupil Information Booklet
Academic Subject	
Fine Arts	
Dramatic Arts	
Language Arts	
Athletics	
Constructing Things	
Personal-Social Development	
Independence	Pupil Information Booklet
Cooperativeness	" " "
Social	" " "
Aggressive Behavior	Coping Analysis Scales in Pupil Information Booklet
Attention Getting	
Manipulating Others	"
Resisting Authority	"
Self-Directed Activity	"
Paying Attention	"
Sharing and Helping	"
Social Interaction	"
Seeking Support	"
Following Directions Passively	"
Observing Passively	"
Responding to Internal Stimuli	"
Physical Withdrawal or Avoidance	"

Class Roster

Prepared for the
UNITED STATES OFFICE OF EDUCATION
by Purdue Educational Research Center
Purdue University, West Lafayette, Indiana

Directions:

Please fill in your name, school, and the grade level of your class across the top of the form. On the left-hand side fill in the name of your students. Please list the students in alphabetical order with the last name first.

You are being asked to provide some descriptive information about the children in your class. To do this simply place an X or number in the appropriate boxes. The sex, race, socioeconomic status (SES), age, reading program, and math program should be marked for all children. In the handicapped category, check only the applicable columns. Refer to the definitions below.

Definitions:

1. Use the following guide to estimate the socioeconomic level of each child's family.

   LOWER - family yearly income less than $5,000
   MIDDLE - family yearly income between $5,000 - $15,000
   UPPER - family yearly income more than $15,000

2. Mental handicap - unable to benefit from the standard school program, slow learners, educable, and trainable mentally retarded.

3. Physical handicap - cleft palate, clubfoot, absence of some member, impairment caused by such illnesses as poliomyelitis, cerebral palsy, or accidents.

4. Speech defects - speech deviates to the extent that it calls attention to itself or interferes with communication.

5. Hearing - "hard of hearing" or "deaf."

6. Vision - impairment in vision, "partially seeing" or "blind."

7. The reading program refers to how the child is taught reading. Check special program if the child is taught by another teacher or individual. Check regular program if the child is taught by you. Check both if the reading instruction is divided.

8. The math program refers to how the child is taught arithmetic. Check special program if the child is taught by another teacher or individual. Check regular program if the child is taught by you. Check both if the arithmetic instruction is divided.

Class Roster

Teacher's Name _____ School _____ Grade _____

Student's Name	DO NOT WRITE IN THIS SPACE (I.D. Number)	Sex		Race			SES			Age		Handicaps					Reading Prog.		Math Prog.	
		GIRL	BOY	BLACK	WHITE	OTHER	LOWER	MIDDLE	UPPER	YEARS	MONTH	MENTAL	PHYSICAL	SPEECH	HEARING	VISUAL	SPECIAL	REGULAR	SPECIAL	REGULAR