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Factors influencing high school achievement

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FACTORS INFLUENCING HIGH SCHOOL ACHIEVEMENT

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Factors influencing high school achievement

by

Arthur B. Jefferson

A Dissertation Submitted to the
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I. INTRODUCTION

Background of the Study

One of the major concerns among educators and the general public today is the quality of education received by our nation's youth. Numerous surveys and reports have focused attention on this ever-growing problem in the American society. In a recent report to the Secretary of Education, Gardner et al. (1983) indicated several educational dimensions of concern. Included among these concerns were:

1. International comparisons of student achievement completed a decade ago, reveal that on 19 academic tests American students were never first or second, and, in comparison with other industrialized nations, were last seven times.

2. Some 23 million American adults are functionally illiterate by the simplest tests of everyday reading, writing, and comprehension.

3. About 13 percent of all 17-year-olds in the United States can be considered functionally illiterate.

4. Average achievement of high school students on most standardized tests is now lower than 26 years ago when Sputnik was launched.

5. The College Board's Scholastic Aptitude Tests (SAT) demonstrate a virtually unbroken decline from 1963 to 1980. Average verbal scores fell over 50 points and average mathematic scores dropped nearly 40 points.

6. COLLEGE BOARD achievement tests also reveal consistent declines in recent years in such subjects as physics and English.

7. There was a steady decline in science achievement scores of U.S. 17-year-olds as measured by national assessments of science in 1969, 1973, and 1977.

In a national survey of teachers in six major cities in America released by Applied Scholastics, Inc. (U.S.A. Today, 1981, p. 12), students lack of basic skills was named as a major problem in teaching by the majority of participants. Sixty-two percent stated that students' lack of basic skills together with their lack of interest and motivation are the greatest barriers to getting students to understand what

they study. Forty-six percent felt that more emphasis should be placed on the basics, especially reading. Twenty-eight percent felt that declining test scores were the result of children watching too much television. More recently, the area of homework has been cited by some educators (e.g., Page and Keith, 1981) as contributing to the decline in achievement test scores. The sixteenth annual Gallup poll (Gallup, 1984) indicated that all segments of the population agree that students in elementary and high schools are not made to work hard in school or on homework. Fifty-nine percent of those interviewed said that students in elementary schools are not required to work hard enough while sixty-seven percent said that students in high school are not required to work hard enough. The majority of the parents, fifty-four and sixty-two percent for elementary and high school respectively, were in agreement with the national totals.

Additional indicators of student performance have been cited by those who make known the effectiveness of schools. A National Assessment of Educational Progress (NAEP) study (Education Commission of the States, 1975) showed that the essays of contemporary thirteen and seventeen-year-old students were more awkward, incoherent, and disorganized than the essays of teenagers tested in 1969. NAEP also

reported in a nationwide survey of seventeen-year-olds and young adults that many consumers are not prepared to shop wisely because of their inability to use fundamental mathematics principles such as figuring with fractions or working with percents. Shiels (1975) informed millions of readers of our nation's problem. He stated:

> "If your children are attending college, the chances are that when they graduate, they will be unable to write ordinary, expository English with any real degree of structure and lucidity. If they are in high school and planning to attend college, the chances are less than even that they will be able to write English at the minimal college level when they get there. If they are not planning to attend college, their skills in writing English may not even qualify them for clerical or secretarial work. And if they are attending elementary school, they are almost certainly not being given the kind of required reading material, much less writing instructions, that might make it possible for them eventually to write comprehensible English. Willy-nilly, the U.S. educational system is spawning a generation of semi-literates" (p. 57).

This concern of quality education was further expressed in a publication written by the National School Public Relations Association (1976) which revealed that parents and communities were concerned whether students were learning the "basics". In 1978, the United States government established a new Title II (P.L.95-561) of the Elementary and Secondary Act of 1965: Title II ... Basic Skills Improvement. The purposes of this legislation were:

1. to assist federal, state, and local educational agencies to coordinate the use of all available resources for elementary and secondary education to improve instruction so that all children are able to master the basic skills of reading, mathematics, and effective communication, both written and oral;

2. to encourage states to develop comprehensive and systematic plans for improving achievement in the basic skills;

3. to provide financial assistance to state and local educational agencies for developing programs in the basic skills;

4. to develop means by which parents working with the schools can contribute to improving the educational achievements;

5. to encourage the envolvement of the private sector in the delivery to children, youths, and adults of educational services and materials that will improve achievement in the basic skills;

6. to expand the use of television and other technology in the delivery of instructional

programs aimed at improving achievement in the basic skills.

An awareness of this problem has resulted in numerous research studies attempting to identify factors related to student achievement with the hope of finding ways to alleviate the problem. Such factors as family, student, peer-group, school, and teacher characteristics have been studied and found to relate to student achievement. Bowles (1970) found that family size had a negative effect upon achievement which indicates that students from large families have a tendency to have lower achievement levels and those students from small families tend to achieve at higher levels. Using sex as an individual student characteristic, Michelson (1970) provided evidence that females tend to have higher levels of reading achievement while males tend to have high levels of mathematics achievement. In his study of social class composition and student achievement, Perl (1973), utilizing the 1959-60 Project Talent data base, found that a positive relationship existed between the two factors. According to Bidwell and Kasarda (1975) pupil-teacher ratio was negatively related to both reading and mathematics achievement. In their study, 104 high school districts were utilized. Their study also presented evidence that the more education the teaching

staff possessed, the higher the level of student achievement.

Other studies as well as some previously cited, relative to student achievement, will be discussed in greater detail in the review of the literature section.

Statement of the Problem

This study investigated the effects of school family, school student, school peer-group, school, and school teacher characteristics on the school achievement of high school students. The question of whether individual variables or a combination of variables measuring the above factors was significantly related to school achievement was studied.

Within this study, the unit of analysis is the school for all variables studied. Some studies have attempted to explain variation in outcome measures at the individual student level while others have tried to explain variation at higher levels such as the school or district. Problems are created, however, when attempts are made to answer questions at one level with data that are inappropriate because they come from a different level. For example, inputs and outputs measured at the school or district level can tell us very little, if anything, about how individual

students learn. "Ecological fallacy" is the label assigned to this type of aggregation. For more detailed discussions about this label, Robinson (1950) is a suggested source.

To be more specific, an attempt to answer the following questions was made: (1) Are there significant relationships between school family characteristics and school student achievement? (2) Are there significant relationships between school student characteristics and school student achievement? (3) Are there significant relationships between school peer-group characteristics and school student achievement? (4) Are there significant relationships between school characteristics and school student achievement? (5) Are there significant relationships between school teacher characteristics and school student achievement? (6) Are there significant relationships between school family, school student, school peer-group, school, and school teacher characteristics combined and school student achievement?

Purpose of the Study

The purposes of this study were: (1) to examine the effect of school student characteristics on high school achievement, (2) to examine the effect of school family characteristics on high school achievement, (3) to examine

the effect of school peer-group characteristics on high school achievement, (4) to examine the effect of school teacher characteristics on high school achievement, (5) to examine the effect of school characteristics on high school achievement, and (6) to examine examine the combined effect of school student, school family, school peer-group, school teacher, and school characteristics on high school achievement.

Justification of the Study

Many years have been devoted to research in an attempt to identify factors which are significantly related to student achievement. These efforts have been encouraged by national, state, and local educational decisionmakers with the hope of finding new and improved guidelines for establishing educational policies. However, there is still much work to be done. Biniaminov and Glasman (1983) stated that:

> "Hundreds and probably thousands of serious attempts have been made to measure the influence of various variables on student achievement. Significant advances have been made in learning theories and organizational theories pertinent to learning. The question of what makes students achieve is still far from being fully explained" (p. 251).

Centra and Potter (1980) stated, "many factors affect student learning, including parents, peers, teachers, schools, and most of all, students themselves. No single study has adequately investigated the influence of all these factors" (p. 273).

Also, according to Biniaminov and Glasman (1983), there have only been a few conceptual models of student achievement that include school variables (p. 251). In an attempt to rectify this situation, Glasman and Biniaminov (1981) in an extensive review of the literature on input-output analysis of schools suggested a structural model of school input and output variables. Another model was proposed by Walberg (1981) which also included school variables. This lack of studying school variables could come from the fact that, according to Brookover et al. (1979) and Rutter et al. (1979), there is moderate agreement that school variables, in fact, affect achievement.

Various statistical techniques have been employed to analyze data relative to the influence of certain factors on student achievement. These techniques have ranged from simple correlations to path analysis. For example, Guthrie et al. (1971) utilized simple correlation techniques to establish relationships between school input and achievement outcome variables. Among those studies using regression

techniques, some have used single-equation ordinary least squares (Cohn, 1968; Perl, 1973; Tuckman, 1971) while others used two-stage least squares (Levin, 1970; Michelson, 1970). Burkhead et al. (1967) used stepwise multiple regression while Coleman et al. (1966) and Wolf (1977) used the variance partitioning approach. The commonality analysis procedure was used by Mayeske et al. (1972, 1973a, 1973b, 1975). According to Glasman and Biniaminov (1981) in their extensive literature review of input-output analyses of schools, only one study (Bidwell and Kasarda, 1975) used a path analysis technique (p. 535).

Based on the above observations, it was felt that a study of this nature was justifiable.

Limitations of the Study

The scope of this study was limited to public high schools which participated in the High School and Beyond national survey; therefore, no attempt was made to extend the findings beyond this sector. The data reflect the characteristics possessed by high school students in attendance at the time the survey was conducted. This study was also limited, in some instances, to those students who had no missing information for the particular variables under study. Further limitations depended on the availability of school characteristics.

Assumptions

For the purposes of this study, the following basic assumptions were made:

1. The High School and Beyond cognitive tests are valid and reliable measures of student achievement.

2. School officials responding to the High School and Beyond school questionnaires responded accurately and honestly.

3. Students who completed the High School and Beyond student questionnaires responded accurately and honestly.

4. The questionnaires used in the High School and Beyond data collection were valid and reliable.

5. The aggregation of individual student data for selected variables provided school level data.

Statement of Hypotheses

The hypotheses tested in this study were as follows:

1. There is a significant relationship between school student characteristics (i.e., educational aspiration, occupational aspiration, locus-of-control, high school grades, time spent on homework, time spent watching television, sex, age) and school student achievement.

2. There is a significant relationship between school family characteristics (i.e., father's occupation, father's education, mother's education, income, number of possessions in the home, number of rooms in the home, parental school visits, number of siblings, parental expectation) and school student achievement.

3. There is a significant relationship between school peer-group characteristics (i.e., percent of students whose best friend plans to attend college, percent enrolled in an academic program) and school student achievement.

4. There is a significant relationship between school teacher characteristics (i.e., education,

experience, absenteeism, motivation) and school student achievement.

5. There is a significant relationship between school characteristics (i.e., number of library volumes, average daily attendance, pupil-teacher-ratio, teacher turnover rate, level of disadvantageness) and school student achievement.

6. There is a significant relationship between school student, school family, school peer-group, school teacher, and school characteristics combined and school student achievement.

Definition of Terms

Within the context of this study, the following terms were defined:

Student Achievement. This term refers to the average performance of students in a school on the High School and Beyond mathematics and reading tests.

Family Characteristics. This term refers to those characteristics related to the families of students within a school such as parents' education, occupational status, income, home possessions, size of family, etc., aggregated to a school level.

Peer-Group Characteristics. This term refers to selected characteristics of the student body at a given school such as enrollment in academic programs and plans to attend college.

Teacher Characteristics. This term refers to selected characteristics of teachers at a given school such as amount of education, experience, level of motivation, and absenteeism.

School Characteristics. The number of library volumes, pupil-teacher-ratio, average daily attendance, teacher turnover rate, and level of disadvantagesness at a given school.

Student Characteristics. This refers to the student variables of sex, self-concept, occupational aspiration, educational aspiration, grades, time spent watching television, time spent during homework, and age aggregated to a school level.

Organization of the Study

This study is divided into five chapters. Chapter one, the introduction, includes the background of the study, statement of the problem, purpose of the study, justification of the study, limitations of the study, assumptions, statement of hypotheses, definition of terms,

and organization of the study. The second chapter presents a review of the literature which includes an introduction, theoretical framework, a summary of publications and research studies related to student achievement, and hypotheses. The third chapter contains the methodology for the study which includes the data sources, population and sample, instrumentation, data collection techniques, measurement of variables, and data analysis techniques including a brief description of each technique employed. Chapter four presents the findings and interpretation of data. The final chapter, chapter five, includes the summary, discussion, and recommendations of the study.

CHAPTER II. REVIEW OF LITERATURE

Introduction

This chapter has been divided into eight sections. The second section, theoretical framework, presents a brief discussion of several theories of educational productivity along with the theory underlying the concepts in this study. This section is followed by five sections which review the literature pertinent to the areas under study and their relationship to student achievement. It should be mentioned that only major studies judged to have had an impact on educational policymakings are included. All effects mentioned are considered significant unless otherwise stated. Finally, the hyptothses tested in this study are presented again.

Theoretical Framework

Many research studies have investigated the relationship between student achievement and other variables. Also, numerous models and theories have been proposed which have relevance to education. Among those who have proposed theories of educational productivity are Carroll (1963), Cooley and Leinhardt (1975), Bloom (1976), Harnischfeger and Wiley (1976), and Walberg (1981).

Carroll proposed a model of educational performance whereby the constructs were defined in terms of time. He assumed that students would master instructional objectives to the extent that they were allowed and were willing to invest the time needed to learn the content. In Carroll's model, there were five major constructs: (1) aptitude, (2) perseverance, (3) ability to comprehend instruction, (4) opportunity to learn, and (5) quality of instruction. The first three constructs related to entering behaviors of students (i.e., behaviors students brought to the instructional setting) while the latter two referred to instructional processes.

Aptitude was defined as the amount of time needed by a student to master an objective under optimal learning conditions. Perseverance, the second construct, referred to the amount of time a student was willing to invest in mastering the objectives. The third construct, ability to comprehend instruction, referred to general or verbal intelligence. Carroll implied that students with high abilities to comprehend instruction will be less affected by inadequate instruction than students with low abilities. Opportunity to learn referred to the amount of time teachers allowed for learning a particular content. The fifth and last construct, quality of instruction, referred to the

organization of instructional materials to aid in ease of student learning.

A classroom-process model was developed by Cooley and Leinhardt. It focused on relationships between school practices and educational performance. In their model they hypothesized that performance was a function of (1) initial abilities, (2) opportunity, (3) motivators, (4) structure, and (5) instructional events. The last four were considered classroom process constructs.

Again, as in Carroll's model, opportunity was defined as the amount of time students were permitted to work on a specific task. Student behaviors and attitudes that promoted learning activities were considered motivators. Structure focused on variables related to curriculum (e.g., organization, objectives, matching of students with curriculum). Instructional events were instructional interactions of interpersonal value. Specifically, it referred to the content, frequency, quality, and length of instruction. Initial abilities, according to Cooley and Leinhardt, included general ability, prior achievement, and attitudes toward school, peers, and teachers.

Bloom assumed that student learning was a function of both the student's cognitive entry behaviors and affective entry characteristics. Cognitive entry behaviors

corresponded to Carroll's construct of aptitude in that they referred to prerequisites to accomplishing certain learning tasks. Whereas Carroll spoke of perseverance as a construct in his model, Bloom introduced affective entry characteristics which included attitudes toward the subject matter, attitude toward school, and self concept as a learner. He also indicated that quality of instruction was reflected in the use of cues, reinforcements, feedback, and by participation of students in the learning task. The results of instruction included achievement as well as affective outcomes.

Another team of theorists, Harnischfeger and Wiley, formulated a model which included background characteristics, teacher-learning processes, and outcomes. Background referred to teacher background, pupil background, and curriculum and institutional factors. Teacher-learning process included teacher activities and pupil pursuits. All three background components influenced teacher activities, and teacher activities along with pupil background, determined pupil pursuit. Then pupil pursuit along with pupil background determined achievement.

Walberg stated that the best equation for achievement performance was the one which assumed that achievement was a function of seven constructs: ability; motivation; quality

of instruction; quantity of instruction; class environment; home environment; and age. He further suggested that:

> "Some of the factors, however, may partially mediate each other: a supportive home environment, for example, may lead to better motivation and the perception of a productive social environment in the class; and capable students may stimulate more teaching of higher quality" (p. 95).

The basic theory underlying this study is that students' educational performance is a function of their individual characteristics, family characteristics, peer-group characteristics, teacher characteristics, and school characteristics.

Student Characteristics Related to Achievement

Several studies have investigated the relationship between individual student characteristics and student achievement. One of the first major studies to investigate such characteristics was conducted by Coleman et al. (1966). In their study, more than 645,000 students in over 4,000 elementary and secondary schools were sampled. Three types of student characteristics were examined in relation to achievement at the sixth, nineth, and twelth grade levels. Included were the students' (1) locus of control, (2) self-concept, and (3) academic motivation. Utilizing the

variance-partitioning procedure it was found that these characteristics had a great impact on achievement when compared to other sources of variation. Coleman et al. summarized the findings as follows:

> "Of all the variables measured in the survey, including all measures of family background and all school variables, these attitudes showed the strongest relation to achievement, at all three grade levels" (p. 319).

Reanalyses of the Coleman data by Mayeske and Beaton (1975) using commonality analysis procedures also indicated that students' attitudes and motivation are more important determinants of achievement than are social class factors. Other studies examining the effects of these affective variables were conducted by Bowles (1970) and Cohn and Millman (1975). Bowles used a sample of 1,000 Black twelfth-grade students from the data set used by Coleman. Cohn and Millman used 53 schools of eleventh graders in Pennsylvania. The results from Bowles study showed a positive relationship between locus of control, self-concept, and achievement while Cohn and Millman, examining only self-concept, also found a positive relationship. The techniques employed by the two studies were both similar and different in that Bowles used ordinary least squares regression and Cohn and Millman used both,

ordinary least squares and two-stage least squares regression.

Among other student characteristics previously studied and tend to have a significant effect on achievement are sex (Michelson, 1970; Tuckman, 1971), age (Levin, 1970; Michelson, 1970), and kindergarten attendance (Levin, 1970; Michelson, 1970). Michelson studied 597 urban white sixth graders and utilized two-stage least squares estimates in addition to ordinary least squares to formulate his conclusions. The results indicated a positive relationship between sex (female=1, male=0) and reading achievement but a negative relationship between sex and mathematics achievement. Tuckman's results support those of Michelson's in terms of sex having an effect. However, he found the percentage of males within the school to be positively related to school performance. Performance was measured as the percentage of students completing high school and the percentage continuing their education. His sample consisted of 1,001 public senior schools and his method of analysis was ordinary least squares regression.

It is commonly believed that the older a student is in relation to his or her classmates, the less that student tends to perform on achievement tests. The results from Levin's study supports this belief. In his study of 597

urban white sixth graders and utilizing two-stage least squares regression in addition to ordinary least squares regression, he found age (12 years or greater=1, else=0) to be negatively related to student achievement. Like Levin, Michelson also found a negative relationship between a student being over-age for his or her grade and achievement. He used the same sample and analyses techniques as Levin.

Many parents now-a-days enroll their preschool age children in kindergarten in hope that the experiences they encounter will carry over into their regular schooling. Studies such as Levin's and Michelson's have provided evidence to the contention that kindergarten attendance does in fact have an impact on both reading and mathematics achievement. In their studies of the 597 urban white sixth graders cited above, they observed that kindergarten attendance was positively related to achievement, however, Levin showed a nonsignificant result.

In addition to Levin, other studies have found nonsignificant relationships between individual student characteristics and achievement. In a study of 458 urban Black sixth graders, Michelson (1970) reported that neither sex nor grade aspiration made a significant contribution to the prediction of achievement. It should be noted however that this was not the case with the sample of white sixth graders.

Cohn and Millman, in their study of 53 schools of eleventh graders cited previously, found self-concept to be a nonsignificant contributor to achievement when verbal and mathematics achievement were considered as outcome measures. The effect, however, was in the positive direction.

Family Characteristics Related to Achievement

When studying the effects that family characteristics have on achievement, findings have been mostly consistent. Many studies have reported that family characteristics have a large impact on student achievement. One of the largest, most comprehensive, and hotly debated studies of this nature was conducted by a team of researchers headed by James S. Coleman (1966). In their study of more than 645,000 students, they were criticized for considering blocks of family background characteristics in their regression equations prior to any other blocks of input. Nevertheless, this study is considered by many to be a benchmark because it stimulated the interest of many theorists causing them to become more involved in educational research. Included among the variables measured were parents' education, family size, items in the home, reading material in the home, parents' interest, and parents' educational desires. These variables accounted for a substantial amount of the variance

in achievement for all subgroups involved. Overall, they accounted for approximately 10 to 25 percent of the variance. When viewed individually, parents' education had more influence on achievement than any other family background factor for subgroups in grades 9 and 12. The authors stated three factors which indicate the impact of family characteristics on achievement.

1. The importance of family background for achievement.

2. The fact that the relation of family background to achievement does not diminish over the years of school.

3. The relatively small amount of school-to-school variation that is not accounted for by differences in family background, indicating the small independent effect of variables in school facilities, curriculum, and staff upon achievement.

In a study of 471 schools of white sixth graders in the metropolitan areas of New England, Mid-Alantic, and the Great Lakes regions, Hanushek (1972) examined the effects of family characteristics on achievement. Family measures used

in his study were family size, father's education, and possessions in the home. Utilizing a multiplicative regression model, he reported a negative relationship between family size and achievement. Both, the amount of the father's education and number of possessions in the home, had a positive effect on achievement. In the second phase of his study, 242 schools of Black sixth graders in metropolitan areas of New England, Mid-Atlantic and Great Lakes regions, his previous findings were supported with the exception of father's education. The direction of the effect was positive, however it was nonsignificant.

Winkler (1975), utilizing two samples which consisted of 388 Black students and 385 white students chosen from the secondary schools of a large urban school district in California, investigated the effect of the educational environment of the home in addition to number of siblings on achievement. In both samples, number of siblings was negatively related, however, with the white sample the effect was nonsignificant. As a measure of educational environment of the home, an index of cultural items in the home were used. As was expected, the relationship was positive. Winkler also used ordinary least squares regression as the method of analysis.

Variables used as measures have been studied by, still, other researchers and found to contribute significantly to the prediction or explanation of achievement. Family income (Burkhead, Fox, and Holland, 1967; Perl, 1973), parents' occupational status (Katzman, 1971; Kiesling, 1969), parents' educational expectation (Levin, 1970), and parents' education (Bidwell and Kasarda, 1975; Perl, 1973) are among those which show consistent results. Burkhead, Fox, and Holland used the median family income of 39 schools of eleventh graders in Chicago and reported a positive relationship with verbal and reading achievement employing stepwise multiple regression procedures. Perl, with a sample of 1,767 low-income male twelfth graders reported that mean family income of the student body was consistently related to achievement. The size of the relationship appeared to be larger for higher income students. Regression coefficients and their significance levels were reported.

Occupations vary in terms of prestige and scales have been developed to assign numerical values to the different categories. It is generally felt that the higher one's occupational status, the higher the achievement levels of his or her children. This contention was supported by Katzman and Kiesling. Katzman, in a study of 56 elementary

school districts in Boston, reported a positive relationship between the percent of white collar workers and both mathematics and reading achievement. Kiesling also reported a positive relationship. In his study of 97 districts of sixth graders in New York State, he found that the measure of parental occupation index was positively related to mathematics achievement and to a composite score on the Iowa Test of Basic Skills. Both authors utilized regression analyses to arrive at their conclusion.

Levin's investigation into the contributions that parents' educational expectations make toward their children's achievement revealed a positive effect. The fact that parents' education affects, positively, the achievement of students, was also supported by Bidwell and Kasarda, and Perl. Bidwell and Kasarda, in a sample of 104 public school districts in the state of Colorado, examined the percent of parents who completed high school in relation to mathematics and reading achievement. Employing path analysis techniques, they observed that parental education had an indirect effect upon reading achievement through its positive effect upon staff qualifications (percentage of total district certified staff who held at least an M.A.). For mathematics achievement, parental education had a sizeable indirect effect. Consistent with there

observations, in his study of 3,265 male twelfth graders, Perl concluded that father's education was significantly and positively related to achievement.

Peer-Group Characteristics Related to Achievement

Several investigators have studied the effects exerted upon a student's achievement by those with whom the student goes to school. Even though many studies have focused on the importance of peer-group characteristics, there have been pitfalls. One of the pitfalls more commonly mentioned is ambiguities due to data aggregation. Nevertheless, variables previously examined and found to have an effect are presented here.

Social class composition, for instance, has been examined by Perl (1973) and Winkler (1975). In his study of 3,265 male twelfth graders, Perl used mean family income as a measure of social class and reported a positive relationship with achievement. He noted that the mean family income of the student body was consistently related to achievement. The size of the relationship, however, tended to get larger for higher income students. Winkler, on the other hand, examined the percentage of school peers of low socioeconomic backgrounds in relation to reading achievement and found a negative relationship. With his two

samples of 388 Black students and 385 white students from the secondary schools of a large urban school district in California, both relationships were negative. However the results from the Black sample were nonsignificant.

Evidence from at least two studies (Michelson, 1970; Murnane, 1975) supports the contention that the ability of the peer group is positively related to a student's own achievement. Michelson sampled 597 white sixth grade students from a large Eastern city. With them, he examined the percent of students achieving in the upper quartile of the nation in relation to both reading and mathematics achievement. He observed a positive association with both variables. Supporting these findings was the evidence in a study conducted by Murnane. Using the mean mathematics achievement score for the class, 440 Black third graders were studied. The observation was positive.

Not all results have been positive. Murnane, using 440 Black second graders, also observed a nonsignificant negative correlation between mean reading achievement of the class and reading achievement for the individual. He also found a nonsignificant negative correlation between the class mean mathematics achievement score and mathematics achievement for the individual.

Other variables examined by Murnane were (1) the standard deviation of reading scores for the class, (2) standard deviation of mathematics scores for the class, and (3) percent of student turnover in a class. Within two of the three samples he used, student turnover, was found to be nonsignificant and negatively related to reading achievement. However, when it came to mathematics, the outcomes were different. The correlations for two samples were significantly negative while the correlation for the third sample was significantly positive.

Another variable studied by several different researchers (Coleman, 1966; Bowles, 1969; Hanushek, 1972; Bidwell and Kasarda, 1975; Winkler, 1975) was racial composition. Coleman stated that, "a pupil's achievement is strongly related to the educational backgrounds and aspirations of the other students in school" (p. 22). Bowles, with a sample of 100 Black male twelfth graders, reported that the percentage of students who were Black had negative effects on both mathematics and general achievement. Hanushek, measuring the percentage of sixth graders in the school who were Black in 242 schools, and who were white in 471 schools, investigated a series of mutually exclusive ranges. He found that racial composition had a significant effect on white verbal achievement only in the

range from 75 to 100 percent Black. In his regressions on Black students, he found a significant effect only when the racial composition was greater than 45 percent Black. There was a significant negative coefficient in the range from 45 to 75 percent and smaller, but also a significant negative coefficient for the range from 75 to 100 percent.

In their study of 104 public school districts in Colorado, Bidwell and Kasarda measured percent nonwhite in relation to achievement. This measure was negatively correlated with both reading and mathematics achievement. Contrary to their findings in part, Winkler found a positive correlation. He used two different samples to arrive at his conclusions. He also used two measures of racial composition. With a sample of 388 Black eighth graders in California and using the proportion of Blacks in the elementary school attended as the measure, he observed a nonsignificant positive association with reading. Using this same measure with 385 white eighth graders in California, he observed a significant positive correlation. When the percent of Blacks in junior high school attended minus percent of Blacks in elementary school attended was used as a measure, the association was significantly positive for the Black sample and positive but nonsignificant for the white sample.

Teacher Characteristics Related to Achievement

In our society, educational policy-makers are concerned with finding the ingredients which bring about higher achievement outcomes in the educational system. They tend to be very concerned about the characteristics of teachers and the schools in which they teach.

Among teacher characteristics previously studied and found to have an impact upon achievement outcomes are amount of education, experience, type of education, recency of education, and salaries. A research team headed by Burkhead (1967) conducted a unified study of 39 Chicago schools, 22 Atlanta schools, and a subsample of 181 schools from the Project TALENT sample. In Chicago and Atlanta, teacher experience and teacher salary were both associated positively. In the Project TALENT sample, teacher experience, and salary were also positively related. Regression techniques were used for analyses.

Katzman (1971) utilized 56 elementary school districts in Boston to examine the impact of teachers with more than 10 years experience on achievement. He found that experience was positively related to both reading and mathematics achievement, however with mathematics, the association was nonsignificant. Other researchers finding results which support those of Burkhead and Katzman were

Raymond (1968), Hanushek (1972), Guthrie et al. (1971), Tuckman (1971), and Summers and Wolfe (1977).

The variable most often used as a proxy for amount of education is the percent or number of teachers with at least a Master's degree (Bidwell and Kasarda, 1975; Murnane, 1975; Perl, 1973). In their sample of 104 high school districts in Colorado, Bidwell and Kasarda reported that the percentage of staff possessing at least a Master's degree was positively related to both reading and mathematics achievement even though with mathematics, the results were not significant. Consistent with these findings in terms of their relationships are the findings presented by Perl from a sample of 3,265 male twelfth graders from the Project TALENT data. His results were positive but nonsignificant.

Contrary to the contention that the more education possessed by the teacher the higher the level of achievement of the student, are the inconsistent results presented in the samples examined by Murnane. In his sample of 440 Black second graders from New Haven, amount of education was negatively related to both reading and mathematics achievement, however with mathematics, the coefficient was not significant. The data from 440 Black third graders provided nonsignificant positive results for both achievement outcome measures.

Type of education has been measured several different ways: mean score on a scale where 1=educational institution and 3=college or university (Levin, 1970); education versus noneducation major (Murnane, 1975); and percent of teachers from "prestigious colleges" (Winkler, 1975). Levin, studying 597 urban white sixth graders in New York State, found a positive association with achievement. This result was supported by Winkler in both of his samples, 388 Black eighth graders and 388 white eighth graders in Chicago. However, the outcome measures were different for the two samples. Levin used verbal achievement while Winkler used reading achievement. In Murnane's study the results were nonsignificant and mixed. It is interesting to note that in Murnane's study, even though the data were analyzed at the individual or individual's classroom level, there were no significant relationships found in any of the samples between a teacher's majoring in education and any measure of student achievement.

One researcher who examined the recency of a teacher's education was Hanushek (1972). The two variables used as proxies in his first subsample were (1) years since most recent degree or course for the present teacher and (2) years since most recent degree or course for the last year's teacher. These two variables were examined with a sample of

515 third graders from blue collar homes. In his second sample, 323 third graders from white collar homes were studied. The same measures were studied. All four outcomes showed negative relationships however only one was significant. This appeared as a result from the blue collar sample which used years since most recent degree or course for the last year's teacher as a measure.

The next section consists of literature related to school characteristics and achievement.

School Characteristics Related to Achievement

This section summarizes the effects that school variables have on achievement exclusive of those pertaining to individual teachers. The question which has received lots of attention in recent years is, "Do schools make a difference?". However, the contributions of school to achievement have not just become a topic of major concern.

As early as 1956, Mollenkopf and Melville (1956) conducted a study which incorporated school factors as input variables to examine their effect on vocabulary, mathematics, and science achievement. They selected 9,600 ninth grade students from 100 public schools and 8,357 twelfth grade students from 106 public schools across the country. Employing simple Pearson correlations techniques,

they observed that only one school factor (library and supply expenditures) was consistently related to achievement. Other variables with some influence were number of special school personnel, class size, and student-teacher ratio.

Ten years following the work of Mollenkopf and Melville, another large scale study was undertaken by James S. Coleman and his associates (1966). From a sample of over 645,000 students, their conclusions were drawn. The amount of unique variance explained by school factors ranged from a low of 0.3 percent for Northern white sixth graders to a high of 8.64 percent for Southern Black twelfth graders. Conclusions drawn were (1) expenditures did not appear to have a significant effect on student achievement, (2) the number of library volumes per pupil and the comprehensiveness of the curriculum were weakly and inconsistently related to verbal achievement, (3) the number of extracurricular activities available to students and the number of science labs in the school had moderate, but consistent, effects on verbal achievement, and (4) in grades 9 and 12, school size was positively related to achievement. They summarized their findings as follows:

> "Differences in school facilities and curriculum, which are the major variables by which attempts are made to improve schools, are so little related

> to differences in achievement levels of students that, with few exceptions, their effects fail to appear even in a survey of this magnitude" (p. 316).

Perl (1973) examined several school input variables in his study with 3,265 male twelfth graders from the Project TALENT study. Expenditure per pupil, enrollment, age of school building, library and supplies, class size, and the number of days in the school year were all found to be positively related to achievement with the exception of enrollment which correlated negatively with abstract reasoning. Also, all the variables were not significant. Nonsignificant variables were enrollment, age of school building, and class size and days in the school year in relation to verbal achievement.

Expenditure has been found to have a positive effect on achievement by several other researchers (Bidwell and Kasarda, 1975; Burkhead, Fox, and Holland, 1967; Cohn and Millman, 1975). Bidwell and Kasarda found school revenue per average daily attendance to have an indirect positive effect through pupil-teacher ratio to both reading and mathematics achievement. They utilized a sample of 104 high school districts in Colorado. In their sample of 181 small community schools of twelfth graders, Burkhead, Fox, and Holland found expenditure per pupil to be a nonsignificant

determinant. Another research team finding positive significance between verbal achievement and extracurricular expenditure per pupil was Cohn and Millman in their sample of 53 schools of eleventh graders in Pennsylvania.

The direction of the effect of enrollment on achievement have been mixed in the literature reviewed for this study. And too, most effects have been statistically nonsignificant. Among those researchers finding mixed or nonsignificant results were Burkhead, Fox, and Holland (1967), Cohn (1968), and Kiesling (1970).

In addition, studies examining the effects of library and supplies showed mixed results. However, where significant relationships existed, they were most often positive. Levin (1970) and Michelson (1970) both studied this impact with a sample of 597 urban white sixth graders. Levin, using books in the library per student as a measure, found a nonsignificant positive results, while Michelson, using number of books in the library, found a positive relationship with verbal achievement and a negative result with mathematics achievement.

Boardman et al. (1973) found the number of teachers leaving a school to be a significant positive factor in the determination of higher levels of achievement. The positive correlation may be explained by assuming that dedicated

teachers tend to remain on the job while those who were not really interested in the profession drop out. The majority of the evidence reviewed supports the contention that teacher turnover is negatively related to achievement. Katzman (1971), utilizing annual rate of teacher turnover for 56 elementary school districts, observed that turnover was negatively related to both verbal and mathematics achievement. The percent of teachers who left in the previous year was used as a measure by Levin (1970) and also found to be negatively related, however nonsignificant. Burkhead, Fox, and Holland's results support these findings. Another possible reason for teacher turnover is that teachers in a district or school of low achieving students may become discouraged and seek positions somewhere else.

Hypotheses

Based on the previous research studies and conceptual framework, the following hypotheses for this study were generated.

1. There is a significant relationship between school student characteristics (i.e., educational aspiration, occupational aspiration, locus-of-control, high school grades, time spent on homework, time spent watching television, sex, age) and school student achievement.

2. There is a significant relationship between school family characteristics (i.e., father's occupation, father's education, mother's education, income, number of possessions in the home, number of rooms in the home, parental school visits, number of siblings, parental expectation) and school student achievement.

3. There is a significant relationship between school peer-group characteristics (i.e., percent of students whose best friend plans to attend college, percent enrolled in an academic program) and school student achievement.

4. There is a significant relationship between school teacher characteristics (i.e., education, experience, absenteeism, motivation) and school student achievement.

5. There is a significant relationship between school characteristics (i.e., number of library volumes, average daily attendance, pupil-teacher-ratio, teacher turnover rate, level of disadvantageness) and school student achievement.

6. There is a significant relationship between school student, school family, school peer-group, school teacher, and school characteristics combined and school student achievement.

CHAPTER III. METHODOLOGY

Introduction

This chapter describes the data sources, the population and sample, instrumentation, data collection techniques, and measurement of variables. It also provides a brief description of the data analysis techniques used in the study. Included among these techniques are correlations and multiple regression.

Data Sources

The data for this study came from a national project titled, "High School and Beyond". High School and Beyond (HS&B) is a national longitudinal study of a sample of high school seniors and sophomores in the United States which follows the progress of young people during the critical periods of transition from high school to postsecondary education, work, and family formation (NCES, 1981). This study was conducted for the National Center for Educational Statistics (NCES) under contract with the National Opinion Research Center (NORC), Chicago, Illinois.

Two tape files were merged to obtain the necessary information for this study. These files were (1) an updated school file, and (2) merged base-year and first follow-up

sophomore file (NCES, 1984). The updated school file contained Base Year data (1980) and First Follow-Up data (1982) from the schools participating in the HS&B sample. First Follow-Up data were requested from only those schools that were still in existence in Spring 1982 and had members of the 1980 sophomore cohort currently enrolled. The merged Base Year and First Follow-Up sophomore file included both Base Year and First Follow-Up data including information on school, family, work experience, educational and occupational aspirations, personal values, and test scores of sample participants.

Population and Sample

The population for the HS&B survey consisted of the Nation's 10th and 12th grade populations totaling 3.8 million sophomores and 3 million seniors in more than 21,000 schools in the Spring of 1980. During the Base Year, data were collected through a two-stage stratified probability sample. In the first stage, 1,105 schools agreed to participate. In the second stage of the sample, 36 seniors and 36 sophomores were randomly selected in each of the schools. In those schools with fewer than 36 seniors or 36 sophomores, all eligible students were drawn in the sample. The final Base Year sample included over 30,000 sophomores

and 28,000 seniors enrolled in 1,015 public and private schools across the nation.

For the First Follow-Up survey, the original sample of 1,015 schools was retained. However, schools which no longer had any 1980 sophomores, had closed, or had merged with other schools within the sample, did not complete a Follow-Up school questionnaire. There were a total of 40 schools which fell into these categories. Therefore, 975 of the 1,015 schools were contacted for the First Follow-Up survey. The student sample consisted of approximately 30,000 1980 sophomores and 12,000 1980 seniors.

The sample for this study consisted of the 803 public schools which participated in both the Base Year and First Follow-Up survey. The students in the sample are those students who participated in the Base Year as sophomores and participated in the First Follow-Up as students still enrolled at their original school. Transfers, dropouts, and early graduates were not included. A total of 20,077 students were included in the final sample.

Instrumentation

Both cognitive tests and questionnaires were used in gathering data from the participants in the High School and Beyond survey. Students were administered tests and

questionnaires while school administrators only completed questionnaires. A description of the instruments used follows.

Cognitive tests

The sophomores cohort was administered the same tests in both the Base Year and the First Follow-Up. The test battery covered the following areas:

1. Vocabulary (21 items, 7 minutes). A brief test using synonym format.

2. Reading (20 items, 15 minutes). A test based on short passages (100-200 words) with several related questions concerning a variety of reading skills (analysis, interpretation) but focusing on straightforward comprehension.

3. Mathematics (38 items, 21 minutes). Quantitative comparisons in which the student indicates which of the two quantitatives is greater, or asserts their equality or the lack of sufficient data to determine which quantity is greater.

4. Science (20 items, 10 minutes). A brief test of science knowledge and scientific reasoning ability.

5. Writing (17 items, 10 minutes). A test of writing ability and knowledge of basic grammar.

6. Civics Education (10 questions, 5 minutes). A test of students' knowledge of various principles of law, government, and social behavior.

According to Heyns and Hilton (1982), Kuder-Richardson-20 (KR-20) reliability estimates for the public school sample of High School and Beyond sophomore students ranged from a low of .52 to a high of .85. A coefficient of .52 was estimated for part-two of the mathematics test and .85 was estimated for part-one of the mathematics test. The reliability estimate for reading was .77. Estimates for the entire sophomore test battery are presented in Table 1.

TABLE 1. Reliability Estimates for Sophomore Test Battery

Test	No. of Items	KR-20
Vocabulary	21	.80
Reading	19[a]	.77
Mathematics I	28	.85
Mathematics II	10	.52
Science	20	.75
Writing	17	.80
Civics Education	10	.53

[a]One item was not scored on the Reading test.

Student questionnaires

The majority of the questions on the Base Year sophomore questionnaires focused on students' behavior and experiences in the secondary school setting. Questions about employment outside the school, postsecondary educational and occupational aspirations, personal and family background, and a small number of questions about personal attitudes and beliefs were also included.

The First Follow-Up survey questionnaire replicates nearly all of the items used in the Base Year questionnaire. However, only that portion of the questionnaire which includes items used in this study is presented in Appendix B. Content areas covered included the following:

1. Education. Questions regarding high school program, courses taken, grades, standardized tests taken, attendance and disciplinary behavior, parental involvment, extracurricular and leisure activities, and assessment of quality of school and teachers.

2. Postsecondary Education. Questions regarding goals, expectations, plans, and financing.

3. Work/Labor Force Participation. Questions focusing on occupational goals and attitudes toward military service.

4. Demographics. Questions regarding parents' education, father's occupation, family composition, school age siblings, family income, marital status, race, ethnicity, sex, birthdate, and physical handicaps.

5. Values. Questions regarding attitudes toward life goals, feelings about self, etc.

School questionnaire

Both the Base Year and First Follow-Up school surveys contained items regarding such institutional characteristics as type of control, ownership, total enrollment, proportions of students and faculty belonging to policy-relevant groups, participation in federal programs, and per-pupil expenditures. Portions of the questionnaire which includes the questions used in this research are presented in Appendix B.

Data Collection Techniques

School data

As explained in the Data File User's Manual for the High School and Beyond First Follow-Up (1982) School

Questionnaire (NCES, 1983), a commitment was first secured from the administrator of each sampled school to participate in the study in both the Base Year and First Follow-Up surveys. In the public schools, the chief state school officer was contacted first to explain the objectives of the study and the data collection procedures, and to identify the specific districts and schools selected for the survey. Once state level approval was granted, district superintendents were contacted. Following their approval, school principals were contacted. For private schools with an administrative hierarchy arrangement, approval was obtained at the higher level before the school principal or headmaster was contacted. Within each cooperating school, the principal was asked to designate a School Coordinator to serve as liaison between the High School and Beyond staff and the school administrator and selected students. The School Coordinator handled all requests for data and materials as well as all logistical arrangements for student-level data collection on the school premises.

In the Fall of 1979 for the Base Year and in the Fall of 1981 for the First Follow-Up, the school questionnaires were sent to the coordinators. The majority of the questionnaires were completed and returned before the Spring survey sessions. Most of the remaining questionnaires were

collected when Survey Representatives visited participating schools to conduct student surveys or in the Fall of 1982 when schools were recontacted for student transcripts for a sample of 1980 sophomores.

Student data

Student data for the Base Year were collected between February 1 and May 15, 1980. Students completed the questionnaires and tests in one session on scheduled survey days. A Survey Representative was present with the group to explain survey procedures and to answer questions. Each school held an orientation day one or two weeks prior to the survey day to inform selected students about the objectives of the study and to brief them on the requirements of participation, voluntary nature of the study, and procedures for protecting the confidentiality of their responses. During orientation, efforts were made to identify all twins and triplets selected into the sample and to recruit the participation of the non-selected twins and triplets. Also during orientation, a check was made to determine whether parental permission forms had been obtained in schools or districts where this was required.

Several steps were taken by students in each survey session. In the first step, students completed a Student Identification Pages (SIP) booklet which requested

information about how they might be contacted for a future follow-up. Secondly, they were given one hour to complete the student questionnaire. Finally, following the completion of the student questionnaires, the cognitive tests were administered. These tests were composed of six timed segments. Students with incomplete data on the booklets or questionnaires were asked to remain so that the missing data could be collected. Survey Representatives made arrangements with the School Coordinators to conduct make-up sessions for students absent from the first survey day.

During the Fall of 1981, School Coordinators reviewed the rosters of High School and Beyond sophomore cohort members originally selected at their schools and indicated the students who were still enrolled at the same schools and those who had transferred to another school, graduated early, or left school without graduating. Data collection arrangements were made for all sophomore cohort members who were still enrolled in the school they attended during the Base Year, or who had transferred as part of a class to another school in the same district. Surveys were conducted between February 15 and June 11, 1982. Teams of Survey Representatives, assisted by School Coordinators, administered questionnaires and tests to groups averaging 20

students in size on scheduled survey days. Make-up sessions were scheduled for all schools in which the response rate was less than 95 percent.

For a more detailed description of the student data collection procedures, contact the Data File User's Manual for the High School and Beyond 1980 Sophomore Cohort First Follow-Up (1982) (NCES, 1983).

Measurement of Variables

The variables used to measure the concepts in this study were based on both theoretical and empirical criteria. Other variables of particular interest to the researcher and which fitted properly into the study's conceptual framework were also included.

Five factors were studied to determine their influence upon the achievement of high school students. These five factors (student characteristics, family characteristics, peer-group characteristics, teacher characteristics, school characteristics) which make up the independent variables, and high school achievement (mathematics achievement, reading achievement) which make up the dependent variable, were measured according to the procedures presented in the sections that follow. References to questions are enclosed within parentheses where the first two characters identify

the school or student questionnaire from which the data were taken. That is, FY, YB, and SB refer to First Follow-Up younger cohort student questionnaire, Base Year younger cohort questionnaire, and Base Year school questionnaire, respectively.

Independent variables

Student characteristics Eight variables were used to operationalize student characteristics. They were:

1. Locus-of-Control: A psychological composite scale of the average standardized scores of four attitude items (FY75B,E,F,G). The coding scheme was: 1 = agree strongly; 2 = agree; 3 = disagree; 4 = disagree strongly; no opinion = missing. The scale was aggregated at the school level using the mean as the measurement of the variable.

2. Sex: The percentage of students within a school who were males. The Base Year questionnaire, Base Year student identification pages, and the Follow-Up questionnaires were checked to locate a valid sex code.

3. Age: The mean age for students within a school. Students younger than 13 or older than 21 were

assigned ages of 13 and 21 respectively (YB85). The constant, two, was added to each age value to account for the two year difference between Base Year and the First Follow-Up.

4. Grades: The average grade for students within a school. The coding scheme used was: mostly A's = 4.0; half A's and B's =3.5; mostly B's = 3.0; half B's and C's = 2.5; mostly C's = 2.0; half C's and D's = 1.5; mostly D's = 1.0; below D = 0.5 (FY7).

5. Homework: Average time per week spent on homework by students within a particular school. The various categories were coded as: no homework assigned or don't do homework = 0; less than 1 hour = 0.5; between 1 and 3 = 2.0; between 3 and 5 = 4.0; 5 to less than 10 = 7.5; 10 to less than 15 = 12.5; 15 or more = 18.0 (FY15).

6. Television: The average number of hours a day during weekdays that students within respective schools watched television. It was categorized and coded as follows: don't watch TV = 1; less than 1 hour = 2; 1 to less than 2 = 3; 2 to less than 3 = 4; 3 to less than 4 = 5; 4 to less than 5 = 6; 5 or more = 7 (FY61).

7. Occupational Aspiration: The job the student would like to have at age 30 (FY77A). Each major category was coded according to Otis Duncan's occupational scale by assigning mean SEI scores to categories. The categories and their coding scheme were: clerical = 56.58; craftsman = 27.41; farmer or farm manager = 28.00; homemaker = missing; laborer = 7.33; manager or administrator = 67.73; military = missing; operative = 19.18; professional = 70.21; proprietor or owner = 49.70; protective service = 38.00; sales = 54.42; school teacher = 70.21; service = 15.90; technical = 16.40; never worked and don't know = missing. The average for each school was used as the variable measure.

8. Educational Aspiration: The level of schooling a student expects to get (FY80). The different levels were coded using the following convention: less than high school = 1; high school = 2; less than two years vocational, trade, etc. = 3; two years or more vocational, trade, etc. = 4; less than two years college = 5; two years or more college = 6; finish college = 7; Master's or

equivalent = 8; Ph.D., M.D., or other advanced degree = 9; don't know = missing. The mean level for each school was used as the measure for the variable.

Family characteristics Nine variables were employed to measure family characteristics. These variables and a description of how they were defined follow.

1. Siblings: The number of children in a family (FY106). Families with more than seven children were assigned a number of seven. The average number of children per family by school was used as the measure for this variable.

2. Rooms: The number of rooms in the home up to a number of 10 (FY112). Homes with more than 10 rooms were coded as having only ten rooms. The value used as a measure for this variable was the average number of rooms per home within a school.

3. Father's Occupation: Father's most recent job (FY53A). Each major category was coded according to Otis Duncan's occupational scale by assigning mean SEI scores to categories. The categories and their coding scheme were: clerical = 56.58;

craftsman = 27.41; farmer or farm manager = 28.00; homemaker = missing; laborer = 7.33; manager or administrator = 67.73; military = missing; operative = 19.18; professional = 70.21; proprietor or owner = 49.70; protective service = 38.00; sales = 54.42; school teacher = 70.21; service = 15.90; technical = 16.40; never worked and don't know = missing. The average for each school was used as the variable measure.

4. Father's Education: Father's highest level of education (FY55). The coding convention for each level was: less than high school = 1; high school = 2; less than two years vocational, trade, etc. = 3; two years or more vocational, trade, etc. = 4; less than two years college = 5; two years or more college = 6; finish college = 7; Master's or equivalent = 8; Ph.D., M.D., or other advanced degree = 9; don't know = missing. The mean level for each school was used as the measure for the variable.

5. Mother's Education: Mother's highest level of education (FY56). The coding scheme used was: less than high school = 1; high school = 2; less

than two years vocational, trade, etc. = 3; two years or more vocational, trade, etc. = 4; less than two years college = 5; two years or more college = 6; finish college = 7; Master's or equivalent = 8; Ph.D., M.D., or other advanced degree = 9; don't know = missing. The mean level for each school was used as the measure for the variable.

6. Parents' Expectation: The level of schooling the parents want their child to accomplish (FY81). The values ranged from 1 to 9 and were assigned to categories as follows: less than high school = 1; high school = 2; less than two years vocational, trade, etc. = 3; two years or more vocational, trade, etc. = 4; less than two years college = 5; two years or more college = 6; finish college = 7; Master's or equivalent = 8; Ph.D., M.D., or other advanced degree = 9; don't know = missing. An average was taken for each school and used as the measurement for the variable.

7. Income: Yearly family income (FY111). This variable was coded as: 7,999 or less = 3,999.5;

8,000 to 14,999 = 11,4999.5; 15,000 to 19,999 = 17,499.5; 20,000 to 24,999 = 22,499.5; 25,000 to 29,999 = 27,499.5; 30,000 to 39,999 = 34,999.5; 40,000 to 49,999 = 44,999.5; 50,000 or more = 52,499.5. The average family income per school was calculated and used as the measure for this variable.

8. Possessions: A composite of thirteen different variables (FY113A TO FY113M). The total number of possessions per family of students within a school were summed and divided by the total number of families and used as a measure for this variable. The possessions in question were: place to study; daily newspaper; encyclopedia; typewriter; dishwasher; two or more vehicles; more than 50 books; room of your own; pocket calculator; color TV; microcomputer; video tape recorder; video disc machine.

9. Parental Visit: Whether or not parents visited classes (FY58C). Visiting was defined as visiting once in a while or visiting often as opposed to not visiting at all. The percentage of parents who visited classes for each school was taken as the unit of measurement.

Peer-group characteristics To operationalize peer-group characteristics, two school level items were utilized. Their description, coding convention, and question reference number are presented in the section that follow.

1. Friend: Whether or not a student's closest senior friend plans to attend college (FY64D). The measure of this variable was the percentage of closest senior friends planning to attend college for each school.

2. Academic: Percent enrolled in an academic program (FY2).

Teacher characteristics Teacher characteristics were measured by five school level variables. A description of these variables and their necessary coding schemes follows.

1. Education: The percent of teachers with a Master's or Doctorate degree (SB42).

2. Experience: The percent of teachers at the school ten years or more (SB45).

3. Teacher Absenteeism: The percent of teachers absent on an average day (SB44).

4. Motivation: Whether or not teachers lack commitment or motivation (SB56F).

School characteristics Previous studies have used different variables as a measure of school characteristics as was evidenced in the review of literature section. Within this study, five variables have been utilized. These five variables and their descriptions follow.

1. Average Daily Attendance: The approximate average daily percentage attendance in the high school (SB8).

2. Library: The number of catalogued volumes in the school library (SB28).

3. Pupil-Teacher Ratio: Two variables were used to construct this measure. The total high school enrollment (SB2A) were divided by the total number of high school teachers (SB39C) to generate the ratio.

4. Teacher Turnover: The percentage of teachers who left the high school for reasons other than death

or retirement at the end of the previous year (SB43).

5. Disadvantageness: Percent of students classified disadvantaged (SB37).

Dependent variable

Student achievement Within the context of this study student achievement has been defined as performance on the High School and Beyond cognitive reading and mathematics tests. These two subtests and a description of their scores are presented below.

1. Mathematics Achievement: The average standardized score for the two parts of the mathematics test. The two components were standardized separately prior to being averaged. After individual averages were computed, an overall average for each school was calculated and used as the variable measure.

2. Reading Achievement: The average standardized reading score for each school was taken as the measure for this variable.

3. Achievement: A composite of averaged mathematics and averaged reading achievement scores aggregated to a school level.

Data Analysis Techniques

The data for this study were analyzed using the Statistical Package for the Social Sciences (Nie et al., 1983). The data underwent several processing stages prior to the analysis stage. First, the data were read from two tape files (SCHOOL, STUDENT) and stored in two separate disk files (SCHOOL, STUDENT) using the IOPROGM and SYNCSORT computer program facilities at Iowa State University's Computation Center. Second, all student level data were aggregated at the school level and saved in a system file (SXSTU). Third, the aggregated student file (SXSTU) was matched with the regular school file (SCHOOL) and saved as a separate system file (SXMATCH). Finally, a program was written to gain access to the matched system file whenever it was needed for analyses. The last three stages were accomplished by using the Statistical Package for the Social Sciences.

The analysis techniques employed in this study were: (1) descriptive, (2) multiple regression, and (3) LISREL VI

analyses. A brief description of each technique and how it was used in this study is presented in the sections that follow.

Descriptive

Each variable in the study was described in terms of its average score (mean), variability (standard deviation), and frequency distribution. In addition, Pearson correlation coefficients were computed for variables within each area (i.e., individual, family, peer-group, teacher, school) to measure the relationships between each variable and every other variable in the same area plus the dependent variable.

Multiple regression

Multiple regression is a technique for determining the relationship between one dependent (criterion) variable and two or more independent (predictor) variables. It analyzes the collective and separate contributions of the independent variables to the variation of a dependent variable.

The classical multiple regression model with K independent variables is defined as

$$Y = B(o) + B(1)X(1) + B(2)X(2) + \ldots + B(k)X(k) + E$$

where Y is the dependent variable, B(o) is the intercept constant, B(1),B(2),...,B(k) are the regression coefficients to be estimated, X(1),X(2),...,X(k) represent the respective independent variables, E denotes the error component, and numbers or letters enclosed within parentheses, (), represent subscripts.

Included among the basic assumptions of multiple regression are the assumptions of linearity and additivity for the independent variables. It is also assumed that an interval level of measurement is used for the dependent variable and that the observations for dependent variable are statistically independent of one another. For hypothesis testing purposes, the normality assumption for the conditional distribution of the dependent variable within categories of the independent variables and the homoscedasticity assumption for the variance of the dependent variable across categories of the independent variables, are made.

In multiple regression, sample estimates of both the population parameters, B(1),B(2),...,B(k), and their variance (standard errors) are calculated in order that t-tests for statistical significance can be performed for each population parameter. In this way, the contribution of each specific variable in the regression model controlling

for the remainder of the variables can be determined. One of the most valuable statistics of multiple regression is the coefficient of multiple correlation, R. This statistic gives an indication of how well the regression model predicts scores on the dependent variable. The coefficient of multiple determination (R-Square), which is the square of the multiple correlation coefficient, is also a valuable statistic. It denotes the proportion of variance in the dependent variable explained by the independent variables. An overall goodness of fit for the model is tested with an F-test of statistical significance.

Stepwise regression Stepwise regression is an improved version of forward regression which permits reexamination, at every step, of the variables entered in the model in previous steps. A variable that entered at an earlier stage may, at a later stage, become superfluous because of its relationship with other variables in the model. To examine this possibility, a partial F-test for each variable already in the model is made at each step, treating it as though it were the most recent variable entered, irrespective of its actual entry point into the model. The variable with the smallest nonsignificant partial F-statistic (if such a variable exist) is removed and the model is refitted with the remaining variables. The

partial F's are computed and examined again. This process is continued until no more variables can be entered or removed.

Within this study, the high school achievement variables (Reading and Mathematics) were regressed on selected factors (i.e., Student, Family, Peer-Group, Teacher, School) which influence achievement to determine their separate and collective contributions.

A detailed discussion of multiple regression is beyond the scope of this study. Pedhazur (1982) is a suggested source for the interested reader.

LISREL VI

The LISREL approach to the analysis of causal models is very versatile. It subsumes a variety of recursive and nonrecursive models with two types of variables. First, the variables may be directly observed (measures, indicators). Secondly, the variables may be latent variables (true values, unobserved variables). Single or multiple indicators of latent variables may be used. It also accounts for measurement errors, correlated errors, and correlated residuals.

The LISREL procedure uses a computer program referred to as LISREL VI (Joreskog and Sorbom, 1981). This program is used to estimate the unknown parameters in a system of

linear structural equations by the method of maximum likelihood. This is the most recent version developed by Joreskog and his associates.

Within this study, an auxiliary analysis using LISREL VI was used as the causal model approach to the model presented in chapter four.

CHAPTER IV. FINDINGS AND INTERPRETATIONS

Introduction

The findings and interpretations resulting from the techniques used to analyze the data in this study are presented in this chapter. The descriptive, regression, and LISREL analyses are presented and discussed as appropriate. For descriptive statistical analyses, the means, standard deviations, and correlation coefficients are presented. For regression, results from the stepwise procedure as well as results from entering all variables are presented. LISREL analyses include maximum likelihood estimates. The different areas are presented in the following order: (1) student characteristics, (2) family characteristics, (3) peer-group characteristics, (4) teacher characteristics, (5) school characteristics, (6) combined characteristics, and (7) auxiliary analyses. The .05 level of significance is used as the probability of committing a TYPE I error.

Table 2 presents the variable names, descriptions, and types for the concepts used in this chapter.

TABLE 2. Variable Names, Descriptions, and Types

NAME	DESCRIPTION	TYPE
STU	STUDENT ASPIRATION	INDIVIDUAL
ACH	ACHIEVEMENT	INDIVIDUAL
READ	READING ACHIEVEMENT	INDIVIDUAL
MATH	MATH ACHIEVEMENT	INDIVIDUAL
EDASP	EDUCATIONAL ASPIRATION	INDIVIDUAL
OCCASP	OCCUPATIONAL ASPIRATION	INDIVIDUAL
LOCUS	LOCUS OF CONTROL	INDIVIDUAL
GRADES	GRADES	INDIVIDUAL
HOMEWK	HOMEWORK	INDIVIDUAL
TV	TELEVISION	INDIVIDUAL
SEX	SEX	INDIVIDUAL
AGE	AGE	INDIVIDUAL
FAM	FAMILY SES	FAMILY
FAOCC	FATHER'S OCCUPATION	FAMILY
FAED	FATHER'S EDUCATION	FAMILY
MOED	MOTHER'S EDUCATION	FAMILY
INC	INCOME	FAMILY
POSSES	POSSESSIONS	FAMILY
ROOMS	ROOMS	FAMILY
PAVIS	PARENTAL SCHOOL VISITS	FAMILY
SIB	SIBLINGS	FAMILY
PAEXP	PARENTAL EXPECTATIONS	FAMILY
PEER	PEER-GROUP INFLUENCE	PEER-GROUP
ACAD	ACADEMIC	PEER-GROUP
FRIEND	FRIEND	PEER-GROUP
TEA	TEACHER QUALITY	TEACHER
EDUC	EDUCATION	TEACHER
EXPER	EXPERIENCE	TEACHER
ABSENT	ABSENTEEISM	TEACHER
MOTIV	MOTIVATION	TEACHER
SCH	SCHOOL CONDITIONS	SCHOOL
LIB	LIBRARY	SCHOOL
ADA	AVERAGE DAILY ATTENDANCE	SCHOOL
PTR	PUPIL-TEACHER-RATIO	SCHOOL
TURNOV	TEACHER TURNOVER	SCHOOL
DISADV	DISADVANTAGENESS	SCHOOL
ADV	ADVANTAGENESS	SCHOOL

Student Characteristics

Descriptive statistical analyses

The means, standard deviations, and Pearson correlation coefficients are presented for each student variable in Table 3 and Table 4. All significant relationships are significant at the .01 level with the exception of the

TABLE 3. Means and Standard Deviations for Student Characteristics

VARIABLE	NUMBER	MEAN	SD
ACH	563	101.68	8.34
EDASP	563	5.45	0.95
OCCASP	563	51.03	7.10
LOCUS	563	0.03	0.23
GRADES	563	2.82	0.26
HOMEWK	563	3.20	1.47
TV	563	4.04	0.44
SEX	563	49.70	12.94
AGE	563	17.50	0.26

relationship between educational aspiration and sex which is significant at the .05 level. Nonsignificant relationships

TABLE 4. Correlation Coefficients (N=563) for Student Characteristics

VARIABLE	1	2	3	4	5	6	7	8	9
1. ACH									
2. EDASP	.51**								
3. OCCASP	.36**	.63**							
4. LOCUS	.61**	.49**	.32**						
5. GRADES	.41**	.21**	.16**	.26**					
6. HOMEWK	.32**	.45**	.31**	.31**	.07				
7. TV	-.47**	-.31**	-.23**	-.32**	-.16**	-.12**			
8. SEX	.13**	-.11*	-.23**	-.05	-.06	-.14**	-.05		
9. AGE	-.26**	-.29**	-.16**	-.24**	-.12**	.00	.22**	.06	

**.01 level of significance.
*.05 level of significance.

occur between amount of homework and high school grades; sex and locus-of-control, high school grades, and hours spent watching television; and between age and homework, and sex. All variables correlate significantly with the dependent variable, achievement. Two variables, hours spent watching TV and age, correlate negatively with the dependent variable. Thus, as expected, the more time students spend watching television and the older the students relative to grade level, the lower the level of achievement at the school.

The next section presents the results from the regression analyses which was used to test the hypothesis regarding school student characteristics and high school achievement.

Regression analyses

> Null Hypothesis 1: There is no significant lrelationship between school student characteristics (i.e., educational aspiration, occupational aspiration, locus-of-control, high school grades, time spent on homework, time spent watching television, sex, age) and school student achievement.

Based on the results presented in Table 5, hypothesis 1 is rejected. Six variables make significant contributions to the explanation of the variance in student achievement when using both methods, stepwise and entering all

TABLE 5. Unstandardized Regression Coefficients (B) and Explained Variance (R-Square) for the Relationship Between Student Achievement and Other Student Characteristics

INDEPENDENT VARIABLES	STEPWISE B	STEPWISE R-SQUARE[a]	ALL VARIABLES B	ALL VARIABLES R-SQUARE
LOCUS	10.75**	.29	10.55**	
GRADES	10.03**	.39	9.96**	
EDASP	2.22**	.46	1.72**	
TV	-3.26**	.49	-3.10**	
SEX	0.10**	.51	0.11**	
HOMEWK	0.72**	.52	0.76**	
AGE			-1.47	
OCCASP			0.09	
Intercept	66.82		86.70	
R-Square (Total)		.52		.52

[a]Cumulative R-Square.
**.01 level of significance.

variables. Those variables, in order of significance, are (1) locus-of-control, (2) high school grades, (3) educational aspiration, (4) time spent watching television, (5) sex, and (6) time spent on homework. Locus-of-control is the greatest single predictor, accounting for 29 percent of the total variance, while time spent on homework is the

least predictor, accounting for an addition of only one percent of the variance.

Inconsistent with the Pearson correlation results, age and occupational aspiration are nonsignificant. This may be the result of the amount of variance age and occupational aspiration have in common with other significant variables. For example, there is a relatively strong relationship (r=.63) between educational aspiration and occupational aspiration.

The five significant variables combined account for a total of 52 percent of the variance in student achievement using the the stepwise results. This is the same amount accounted for when all variables are entered into the analyses. Therefore, age and occupational aspiration are not only nonsignificant, but also contribute nothing extra to the explanation of achievement variance after considering the contributions made by the other variables.

Family Characteristics

Descriptive statistical analyses

Table 6 and Table 7 present the descriptive statistics for family characteristics and student achievement. The means, standard deviations, and Pearson correlation coefficients are included. Results from the correlation

matrix indicate that all family variables are significantly related to student achievement. They range in magnitude

TABLE 6. Means and Standard Deviations for Student Achievement and Family Characteristics

VARIABLE	NUMBER	MEAN	SD
ACH	563	101.68	8.34
FAOCC	563	39.65	9.52
FAED	563	4.55	1.22
MOED	563	4.20	0.92
INC	563	26042.13	6849.81
POSSES	563	7.92	0.97
ROOMS	563	6.78	0.82
PAVIS	563	22.11	14.00
SIB	563	3.84	0.65
PAEXP	563	6.22	0.86

from -.24 for the relationship between parental school visits and achievement to .66 for the relationship between achievement and both, father's education and number of possessions in the home. Nonsignificant relations exist between parental visits and father's occupation, father's

TABLE 7. Correlation Coefficients (N=563) for Family Characteristics and Student Achievement

VARIABLE	1	2	3	4	5	6	7	8	9	10
1. ACH										
2. FAOCC	.62**									
3. FAED	.66**	.82**								
4. MOED	.55**	.68**	.80**							
5. INC	.61**	.69**	.76**	.63**						
6. POSSES	.66**	.64**	.66**	.54**	.72**					
7. ROOMS	.56**	.42**	.44**	.41**	.55**	.51**				
8. PAVIS	-.24**	-.04	-.07	.03	-.20**	-.19**	-.16**			
9. SIB	-.37**	-.41**	-.42**	-.37**	-.41**	-.47**	-.11**	.18**		
10. PAEXP	.27**	.48**	.55**	.53**	.31**	.21**	.05	.20**	-.21**	

**.01 level of significance.

education, and mother's education, and also between parental expectation and the number of rooms in the home. Negative relationships exist between parental school visits and all other variables except mother's education. Negative relationships also exist between number of siblings and all the other variables.

Relative to student achievement, seven variables have a positive effect. Specifically, high levels of achievement are associated with high levels of fathers' occupations, high levels of fathers' education, high incomes, large numbers of possessions in the home, large numbers of rooms in the home, and high levels of parental expectations. The negative relationships with parental school visits and number of siblings suggest that schools having large families and more parents visiting the school are associated with low achievement.

Regression analyses

> Null Hypothesis 2: There is no significant relationship between school family characteristics (i.e., father's occupation, father's education, mother's education, income, number of possessions in the home, number of rooms in the home, parental school visits, number of siblings, parental expection) and school student achievement.

Multiple regression results presented in Table 8 indicate that five variables make significant contributions

to the explanation of achievement variance. Therefore, hypothesis 2 is rejected. These five variables (number of possessions, father's education, number of rooms, parental school visits, parental expectation) account for a total of 47 percent of the variance. Reviewing the results from

TABLE 8. Unstandardized Regression Coefficients (B) and Explained Variance (R-Square) for the Relationship Between Student Achievement and Family Characteristics

INDEPENDENT VARIABLES	STEPWISE B	STEPWISE R-SQUARE[a]	ALL VARIABLES B	ALL VARIABLES R-SQUARE
POSSES	2.65**	.35	2.21**	
FAED	1.72**	.42	1.51**	
ROOMS	2.42**	.45	2.42**	
PAVIS	-0.08**	.46	-0.07**	
PAEXP	1.30**	.47	1.31**	
SIB			-0.49	
INC			----[b]	
MOED			-0.80	
FAOCC			0.07	
Intercept	49.88		54.30	
R-Square(Total)		.47		.47

[a]Cumulative R-Square.
[b]8.82131E-05.
**.01 level of significance.

the stepwise technique, it can be observed that number of possessions, alone, accounts for the majority (35%) of the explained variance. Parental school visits and parental expectations account for an additional one-percent of the explained variation individually. When all variables are entered into the equation, there is no improvement in the prediction of achievement. Still, only 47 percent of the total variation is accounted for by these variables.

Consistent with the correlational results, all significant contributions have a positive effect with the exception of parental school visits. Again, this is indicative of the fact that schools where parents visit the classes tend to have lower levels of achievement than schools where parents do not visit the classes. This also suggests that schools associated with families with large numbers of home possessions, high levels of fathers' education, large numbers of rooms in the home, and high levels of parental expectations, tend to have high achievement levels.

Peer-Group Characteristics

Descriptive statistical analyses

The means, standard deviations, and Pearson correlation coefficients for student achievement and peer-group

variables are presented in Table 9. There is a significant positive relationship between each pair of variables. The positive relationship that exist between the variables indicate that high levels of each variable are associated with high levels of achievement.

TABLE 9. Means, Standard Deviations, and Correlation Coefficients (N=563) for Student Achievement and Peer-Group Characteristics

VARIABLE	MEAN	SD	CORRELATION MATRIX 1	2	3
1. ACH	101.68	8.34			
2. ACAD	40.96	26.18	.33**		
3. FRIEND	71.43	16.24	.31**	.28**	

**.01 level of significance.

Regression analyses

> Null Hypothesis 3: There is no significant relationship between school peer-group characteristics (i.e., percent of students whose best friend plans to attend college, percent enrolled in an academic program) and school student achievement.

Evidence presented in Table 10 indicates that both, percent whose best friend plans to attend college and enrollment into academic programs, contribute significantly

TABLE 10. Unstandardized Regression Coefficients (B) and Explained Variance (R-Square) for the Relationship Between Student Achievement and Peer-Group Characteristics

INDEPENDENT VARIABLES	STEPWISE B	STEPWISE R-SQUARE [a]	ALL VARIABLES B	ALL VARIABLES R-SQUARE
FRIEND	0.15**	.12	0.15**	
ACAD	0.08**	.16	0.08**	
Intercept	87.36		87.36	
R-Square(Total)		.16		.16

[a]Cumulative R-Square.
**.01 level of significance.

to the explanation of achievement variance. Results from the stepwise procedure as well as the inclusion of all variables into the equation present the same outcome. The total amount of explained variance (16%) is explained mostly by the FRIEND variable (12%). Both variables are positively related to achievement which supports the findings from the zero-order correlation results. Based on this evidence, hypothesis 3 is rejected.

Teacher Characteristics

Descriptive statistical analyses

All teacher variables are positively and significantly related to achievement with the exception of teacher absenteeism. It is significant but negatively related indicating that the more the teachers are absent at a school, the less the achievement level of the school. The positive relations with achievement indicate that the more education, experience, and motivation teachers posses at a school, the higher the achievement level of the school. These results are presented in Table 11.

TABLE 11. Means, Standard Deviations, and Correlation Coefficients (N=563) for Student Achievement and Teacher Characteristics

			CORRELATION MATRIX				
VARIABLE	MEAN	SD	1	2	3	4	5
1. ACH	101.68	8.34					
2. EDUC	50.45	23.62	.10**				
3. EXPER	43.19	23.69	.18**	.26**			
4. ABSENT	4.08	3.03	-.12**	.07	.04		
5. MOTIV	3.02	0.62	.20**	-.02	-.04	-.23**	

**.01 level of significance.

Nonsignificant relationships exist between teacher absent and education, and experience; and between teacher motivation and education, and experience.

Regression analyses

> Null Hypothesis 4: There is no significant relationship between school teacher characteristics (i.e., education, experience, absenteeism, motivation) and school student achievement.

Examining the regression results in Table 12 reveals that all four teacher variables are significantly related to achievement. Therefore, hypothesis 4 is rejected. Specifically, motivation, experience, and education make a positive contribution to the explanation of achievement variance while absenteeism makes a negative contribution. The more teachers available at a school with at least a master's degree, ten or more years experience at the same school, and who do not lack motivation, the higher the achievement level. On the other hand, the larger the percentage of teacher absenteeism, the less the achievement level of the school.

Even though all four variables make significant contributions, they account for a total of only nine-percent of the variance. The amount of explained variance from the stepwise procedure and from entering all variables are

TABLE 12. Unstandardized Regression Coefficients (B) and Explained Variance (R-Square) for the Relationship Between Student Achievement and Teacher Characteristics

INDEPENDENT VARIABLES	STEPWISE B	STEPWISE R-SQUARE [a]	ALL VARIABLES B	ALL VARIABLES R-SQUARE
MOTIV	2.79**	.04	2.79**	
EXPER	0.06**	.08	0.06**	
EDUC	0.04*	.08	0.04*	
ABSENT	-0.27*	.09	-0.27*	
Intercept	89.58		89.58	
R-Square(Total)		.09		.09

[a]Cumulative R-Square.
**.01 level of significance.
*.05 level of significance.

identical. These findings are also consistent with the outcome from the Pearson correlations.

School Characteristics

Descriptive statistical analyses

Evidence presented in Table 13 indicates that student achievement is significantly related to the number of library volumes, average daily attendance, teacher turnover

TABLE 13. Means, Standard Deviations, and Correlation Coefficients (N=563) for Student Achievement and School Characteristics

VARIABLE	MEAN	SD	CORRELATION MATRIX 1	2	3	4	5	6
1. ACH	101.68	8.34						
2. LIB	16121.31	8993.70	.09*					
3. ADA	90.87	5.40	.35**	-.08				
4. PTR	20.35	15.77	-.03	.03	-.05			
5. TURNOV	6.30	6.97	-.13**	-.19**	.09*	-.09*		
6. DISADV	18.50	21.52	-.59**	-.05	-.38**	.03	-.01	

**.01 level of significance.
*.05 level of significance.

rate, and level of disadvantageness. There is a nonsignificant negative relationship between achievement and pupil-teacher-ratio. The strongest relationship with achievement occurs between disadvantageness and achievement (r=-.59), however it is negative. The weakest significant relationship with achievement occurs between number of library volumes and achievement (r=.09). Other nonsignificant bivariate relationships are as follows: average daily attendance vs number of library volumes; pupil-teacher-ratio vs number of library volumes, and

average daily attendance; and level of disadvantageness vs number of library volumes, pupil-teacher-ratio, and teacher turnover rate.

Regression analyses

> Null Hypothesis 5: There is no significant relationship between school characteristics (i.e., number of library volumes, average daily attendance, pupil-teacher-ratio, teacher turnover rate, level of disadvantageness) and school student achievement.

When the school variables were subjected to regression analyses, the outcome was as presented in Table 14. The total amount of variance explained is 31 percent. Relative to explained variance, the amount of explained variance from the stepwise method and when all variables were entered is identical.

Three variables contribute significantly to the explanation of achievement variance. Therefore hypothesis 5 is rejected. Level of disadvantageness and teacher turnover rate are negatively related to achievement. This suggests that the higher the level of disadvantageness and the higher the turnover rate, the lower the achievement level of the school. Average daily attendance is positively related, suggesting that high attendance rates are associated with high levels of achievement at the school. Nonsignificant variables are pupil-teacher-ratio and number of library

TABLE 14. Unstandardized Regression Coefficients (B) and Explained Variance (R-Square) for the Relationship Between Student Achievement and School Characteristics

INDEPENDENT VARIABLES	STEPWISE B	STEPWISE R-SQUARE[a]	ALL VARIABLES B	ALL VARIABLES R-SQUARE
DISADV	-0.20**	.28	-0.20**	
TURNOV	-0.19**	.29	-.17**	
ADA	0.23**	.31	0.24**	
PTR			----[b]	
LIB			----[c]	
Intercept	85.81		83.55	
R-Square(Total)		.31		.31

[a]Cumulative R-Square.
[b]-1.46693E-03.
[c]7.00441E-05.
**.01 level of significance.

volumes. Even though they are not significant, their relationships are in the expected direction. One would expect that the more students a teacher has within the classroom, the less the achievement level of the school. Also, good library facilities should be positively related to achievement.

Combined Characteristics

Regression analyses

> Null Hypothesis 6: There is no significant relationship between school student characteristics (i.e., educational aspiration, occupational aspiration, locus-of-control, high school grades, time spent on homework, time spent watching television, sex, age), school family characteristics (i.e., father's occupation, father's education, mother's education, income, number of possessions in the home, number of rooms in the home, parental school visits, number of siblings, parental expectation), school peer-group characteristics (i.e., percent of students whose best friend plans to attend college, percent enrolled in an academic program), school teacher characteristics (i.e., education, experience, absenteeism, motivation), and school characteristics (i.e., number of library volumes, average daily attendance, pupil-teacher-ratio, teacher turnover rate, level of disadvantageness) combined and school student achievement.

Based on the results presented in Table 15, hypothesis 6 is rejected. A review of the regression coefficients (for final equation) from the stepwise procedure indicates that six of the eight student variables (i.e., educational aspiration, high school grades, locus of control, amount of homework, sex, hours spent watching television), six of the nine family variables (i.e., possessions in the home, rooms in the home, parental expectation, parental school visits, income, mother's education), three of the four teacher variables (i.e., motivation, absenteeism, experience), and two of the five school variables (i.e., level of

TABLE 15. Unstandardized Regression Coefficients (B) and Explained Variance (R-Square) for the Relationship with Combined Characteristics

INDEPENDENT VARIABLES	STEPWISE B	STEPWISE R-SQUARE[a]	ALL VARIABLES B	ALL VARIABLES R-SQUARE
POSSES	1.44**	.35	1.43**	
EDASP	3.38**	.46	3.20**	
GRADES	7.95**	.54	8.02**	
ROOMS	1.09**	.57	0.98**	
LOCUS	5.20**	.59	5.32**	
PAEXP	-1.31*	.60	-1.38**	
DISADV	-0.04*	.61	-0.04**	
HOMEWK	0.63**	.62	0.59**	
PAVIS	-0.04*	.63	-0.04*	
MOTIV	0.94*	.63	0.92*	
SEX	0.03*	.64	0.04*	
TV	-1.32**	.64	-1.19*	
ABSENT	-0.16*	.64	-0.15	
INC	----**[b]	.65	----*[c]	
MOED	-0.84*	.65	-0.86	
EXPER	0.82*	.65	0.02	
ADA	0.10*	.65	0.11*	
PTR			----[d]	
TURNOV			-0.05	
EDUC			0.01	
AGE			0.11	
ACAD			----[e]	
LIB			----[f]	
SIB			0.29	
OCCASP			0.04	
FRIEND			----[g]	
FAOCC			----[h]	
FAED			0.12	
Intercept	40.73		35.86	
R-Square(Total)		.65		.66

[a]Cumulative R-Square.
[b]1.43086e-04.
[c]1.22913e-04.
[d]7.93188e-03.
[e]9.09804e-03.
[f]-3.17222e-05.
[g]4.47073e-03.
[h]-8.65309e-03.
**.01 level of significance.
*.05 level of significance.

disadvantageness, average daily attendance) make a significant contribution to the explanation of achievement variance. They account for 65 percent of the total variation. This is only one-percent less than the amount of variance accounted for by entering all the variables in the equation. However, when all variables are entered, three variables which were previously significant fail to make a significant contribution. They are teacher absenteeism, mother's education, and teacher experience.

Other variables which fail to make a significant contribution are pupil-teacher-ratio, teacher turnover rate, teacher's education, age of student, percent enrolled in academic programs, number of library volumes, number of siblings, occupational aspiration, friend's influence, father's occupation, and father's education.

A further investigation of the data was undertaken to examine the "unique" effect each block (area) of variables would have on achievement. The unique contribution is defined as the contribution of the block of variables after all other variables not in the block under consideration. These results are presented in Table 16.

Evidence in Table 16 indicates that all blocks of variables make a significant unique contribution to the

TABLE 16. Results from the Unique Contributions of Student, Family, Peer-Group, Teacher, and School Characteristics to Student Achievement

SOURCE	DF	R-SQUARE[a]	F-VALUE
Student	8, 556	.13	25.31**
Family	9, 555	.04	7.32**
Peer-group	2, 562	.00	0.44
Teacher	4, 560	.01	4.11**
School	5, 559	.01	3.36**

[a]Unique R-Square.
**.01 level of significance.

explanation of achievement variance with the exception of peer-group. Student variables have the greatest unique effect accounting for an additional 13 percent of the variance. The block of family variables is the the next greatest unique contributor accounting for four-percent. One-percent is accounted for by each, the teacher and school blocks.

Auxiliary Analyses

As was mentioned in chapter one, Glasman and Biniaminov (1981) conducted an extensive review of the literature on input-output analyses of schools. They went even further to

suggest a structural model of school input and output variables (see Appendix A). It is the purpose of this section of the study to test a model based in part on the general conceptual model proposed by Glasman and Biniaminov. The model tested does not include all the variables presented in their general conceptual model. The available data were judged to be sufficient for an auxiliary analysis using selected variables within their proposed model.

The original conceptual model tested in this study is presented in Figure 1. The postulated causal relations among the variables of the model are represented by unidirectional arrows extending from each set of determining variables to each set of variables depending on it. Note that the diagram allows for only one-way causations. This indicates that the model is recursive.

To test the model, the LISREL VI computer program developed by Joreskog and Sorbom (1981) was utilized. According to LISREL specifications, FAMILY SOCIOECONOMIC STATUS is referred to as a latent exogenous variable. SCHOOL CONDITIONS, TEACHER QUALITY, PEER-GROUP INFLUENCE, STUDENT ASPIRATIONS, and ACHIEVEMENT are called latent endogenous variables. Father's education, mother's education, father's occupation, income, possessions, average daily attendance, advantageness (recoded form of

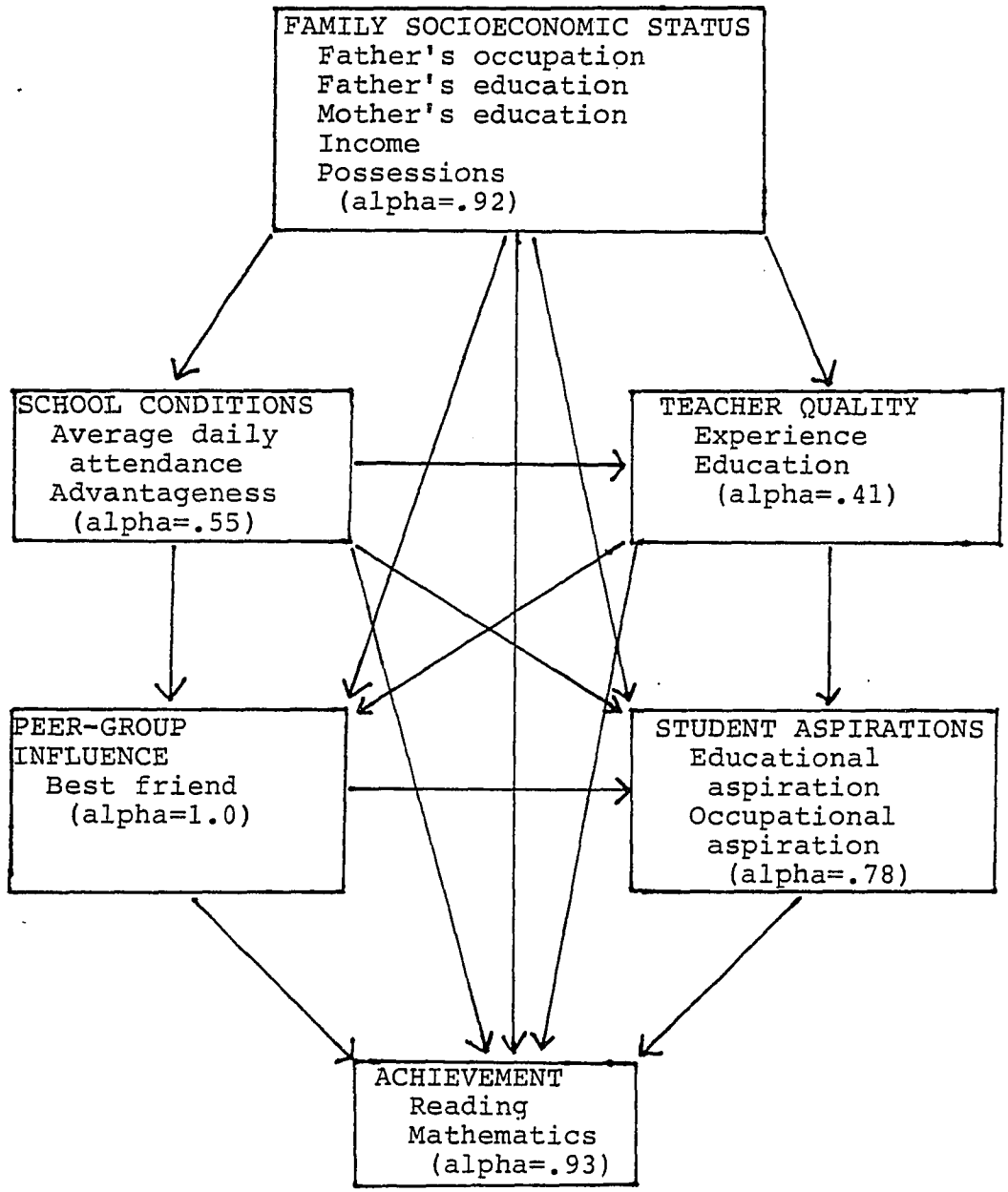

FIGURE 1. Original Conceptual Model of High School Achievement

disadvantageness), experience, education, best friend, educational aspiration, occupational aspiration, mathematics, and reading are considered observed variables (i.e., indicators of latent variables). Enclosed within parentheses for each set of variables is Cronbach's coefficient alpha reliability estimate.

LISREL VI analyses

The correlation matrix in Table 17 was used as the method of input for testing the model according to LISREL specifications. Judgement about the adequacy of the model can be determined in two ways: (1) by calculating a chi-square goodness of fit statistic, and (2) by observing the residual matrix obtained by finding the difference between the observed correlations and the correlations reproduced by the parameter estimates. According to Joreskog (1971) the closeness of the chi-square value to the degrees of freedom is a good indication of the adequacy of fit.

The relationships among the endogenous variables are presented in Table 18. Significant relationships exist between school conditions and peer-group influence, student aspirations, and achievement. Significant relationships also exist between peer-group influence and both, student aspirations and achievement. Finally, there is a

TABLE 17 . Correlation Matrix (N=563) for Variables in the Model

VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. EDASP														
2. OCCASP	.63													
3. READ	.44	.31												
4. MATH	.55	.38	.87											
5. FAOCC	.63	.50	.57	.63										
6. FAED	.68	.50	.61	.67	.82									
7. MOED	.65	.47	.51	.55	.68	.80								
8. INC	.46	.35	.57	.61	.69	.76	.63							
9. POSSES	.35	.29	.64	.63	.64	.66	.54	.72						
10. ADA	.02	-.05	.37	.32	.24	.22	.13	.21	.31					
11. ADV	.21	.12	.57	.57	.41	.45	.36	.54	.63	.38				
12. EDUC	.21	.19	.10	.10	.17	.18	.17	.20	.10	-.15	.02			
13. EXPER	.11	.08	.16	.18	.08	.12	.13	.15	.13	-.01	.13	.26		
14. FRIEND	.67	.45	.25	.35	.41	.46	.52	.27	.22	.06	.15	.11	.10	

significant relationship between student aspirations and achievement. Teacher quality is not significantly related to any of the other endogenous variables. The results presented in Table 19 indicates that the exogenous variable, family socioeconomic status, is significantly related to all the endogenous variables with the exception of achievement.

TABLE 18. Maximum Likelihood Estimates for the Relationship Between Endogenous Variables-BETA MATRIX (Model 1)

VARIABLE	SCH	TEA	PEER	STU	ACH
SCH					
TEA	-.18				
PEER	-.42**	-.04			
STU	-.60**	.10	.38**		
ACH	1.27**	.13	-.17**	.56**	

**.01 level of significance.

Even though 42, 11, 25, 79, and 77 percent of the variation in school conditions, teacher quality, peer-group influence, student aspirations, and achievement were explained, respectively, by each set of equations, some of the relationships seem illogical. Specifically, the

TABLE 19. Maximum Likelihood Estimates for the Relationship Between Endogenous and Exogenous Variables-GAMMA MATRIX (Model 1)

VARIABLE	FAM
SCH	.38**
TEA	.16*
PEER	.71**
STU	.82**
ACH	-.07

**.01 level of significance.
*.05 level of significance.

negative relationships between school conditions and the other endogenous variables, and between peer-group influence and achievement appear to be unusual. An examination of the goodness of fit statistic revealed unwanted evidence. For a chi-square value of 473.93 and 63 degrees of freedom, there was a ratio of 7.53 per degree of freedom and a probability level less than .001. This suggested that the model was not a good fit.

Speculating that, perhaps, the nonsignificant and unusual relations were contributing to the problem of fitting the model, a revised model was developed (see Figure 2). This model eliminates the paths from school conditions to teacher quality, peer-group influence, and student

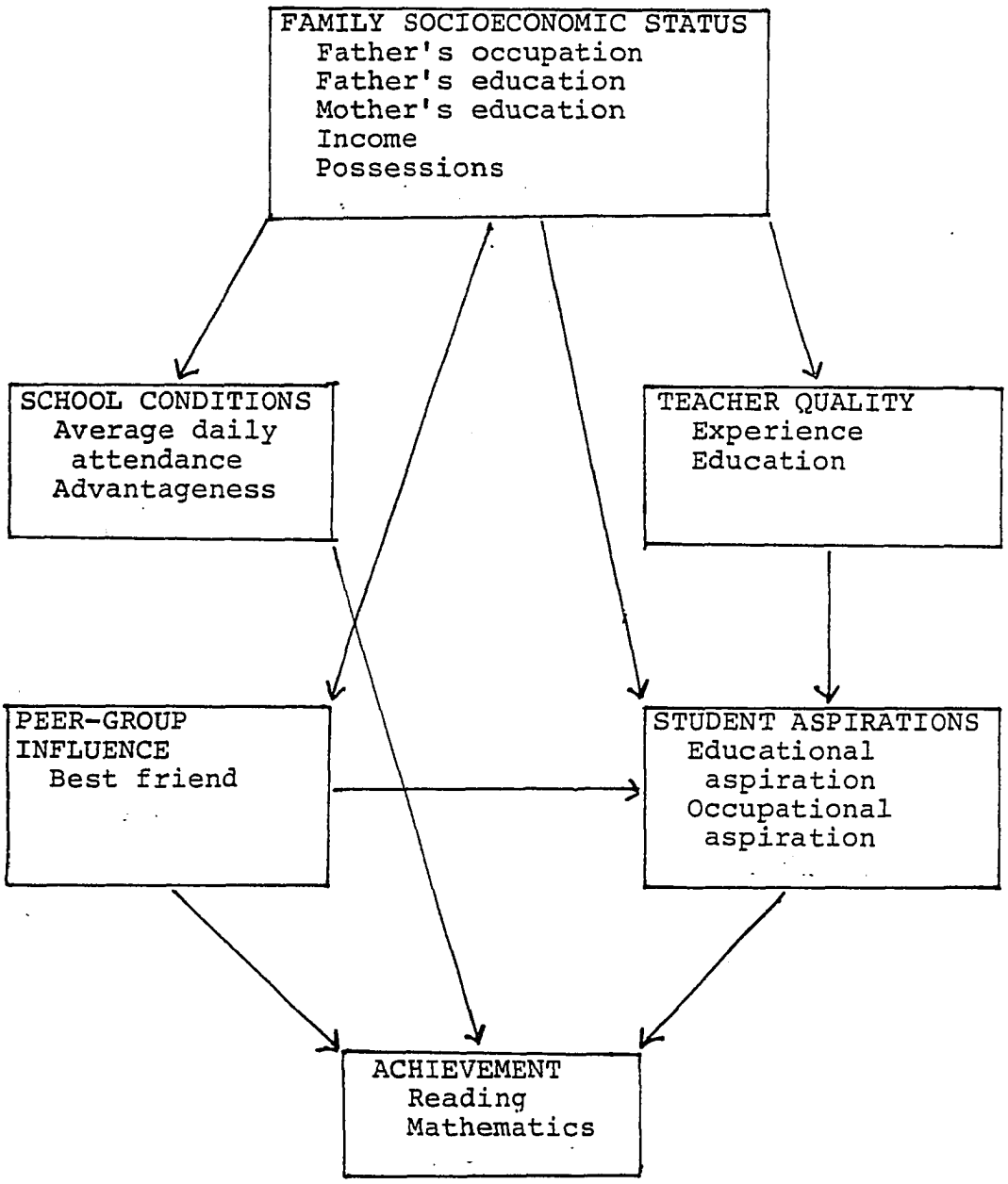

FIGURE 2. Revised Model of High School Achievement (Model 2)

aspirations. Also eliminated is the path between teacher quality and peer-group influence.

The chi-square goodness of fit test for this model indicates that the revised model fits slightly worse than the original model. With a chi-square value of 534.21 and 68 degrees of freedom, the goodness of fit ratio has increased to 7.86. In addition, the difference between the initial chi-square value and that in the present model is 60.28. The difference in degrees of freedom is five. The change in chi-square per degree of freedom is more than 12. There is still a probability level of less than .001.

An inspection of the data in Table 20 indicates that school conditions, peer-group influence, and student aspirations are direct determinants of achievement. Also, teacher quality and peer-group influence are indirect determinants through student aspirations. Evidence presented in Table 21 indicates that family socioeconomic status has an indirect effect on achievement through its relationship with school conditions, peer-group influence, and student aspirations. The amount of variance accounted for by the five sets of structural equations are 46, 10, 22, 74, and 82 percent respectively for school conditions, teacher quality, peer-group influence, student aspirations, and achievement.

TABLE 20. Maximum Likelihood Estimates for the Relationship Between Endogenous Variables-BETA MATRIX (Model 2)

VARIABLE	SCH	TEA	PEER	STU	ACH
SCH					
TEA					
PEER					
STU		.25*	.43**		
ACH	1.41**	.08	-.12**	.38**	

**.01 level of significance.
*.05 level of significance.

TABLE 21. Maximum Likelihood Estimates for the Relationship Between Endogenous and Exogenous Variables-GAMMA MATRIX (Model 2)

VARIABLE	FAM
SCH	.36**
TEA	.15*
PEER	.54**
STU	.54**
ACH	

**.01 level of significance.
*.05 level of significance.

According to Joreskog (1969, p. 201), the question of when to stop fitting "cannot be decided on a purely statistical basis." He also points out that it is quite important for the researcher to also consider theoretical and conceptual considerations. From a statistical point of view, this model still does not fit the data well. However, in terms of the theory underlying the concepts in the model, it appears to be an improvement over the original model even though the estimate for the relationship between school conditions and achievement is still larger than expected.

CHAPTER V. SUMMARY, DISCUSSION, AND RECOMMENDATIONS

This chapter summarizes the previous four chapters, discusses conclusions, and presents a list of recommendations for future research.

Summary

The objective of this study was to examine the effect of selected school student, school family, school peer-group, school teacher, and school characteristics on high school achievement. The review of the literature substantiated the fact that certain variables from each of these areas (student, family, peer-group, teacher, and school) do indeed influence achievement. Some variables from each area had a positive effect, some had a negative effect, and others were mixed having a positive effect in some studies and a negative effect in other studies.

To further enhance research on high school achievement, this study developed and tested the following six null hypotheses:

1. There is no significant relationship between school student characteristics and school student achievement.
2. There is no significant relationship between school family characteristics and school student achievement.

3. There is no significant relationship between school peer-group characteristics and school student achievement.
4. There is no significant relationship between school teacher characteristics and school student achievement.
5. There is no significant relationship between school characteristics and school student achievement.
6. There is no significant relationship between school student, school family, school peer-group, school teacher, and school characteristics combined and school student achievement.

In order to test the above hypotheses, data from a national project titled "High School and Beyond" were utilized. High School and Beyond is a national longitudinal study of a sample of high school sophomores and seniors in the United States which follows the progress of young people during the critical periods of transition from high school to postsecondary education, work, and family formation. The initial survey was conducted in the Spring of 1980, and the first follow-up conducted in the spring of 1982 by the National Opinion Research Center in Chicago, Illinois. This center was under contract with the National Center for

Educational Statistics in Washington, DC. Both cognitive tests and questionnaires were used in gathering the data from the participants. Students were administered both tests and questionnaires while school administrators completed only questionnaires.

The sample for the present study consisted of those public high school students who were sophomores at the time of the initial survey and were still enrolled at their original school during the first follow-up. This resulted in a sample of 803 public schools with 20,077 total students. Where necessary, student data were aggregated to the school level. The total realized sample was 565 public schools.

The methods of analyses for this study were descriptive statistics, multiple regression, and LISREL VI. Descriptive statistics used were means, standard deviations, and Pearson correlation coefficients. Multiple regression was used to test the six hypotheses presented earlier. LISREL VI was used to analyze the high school achievement model presented in the auxiliary analysis section of this research.

As a result of the analyses, all six null hypotheses were rejected. Hypothesis 1 which dealt with the effect of student characteristics on student achievement was rejected because six of the eight variables studied were found which

made significant contributions to the explanation of achievement variance. These variables were, in order of significance, locus-of-control, high school grades, educational aspirations, time spent watching television, sex, and amount of time spent on homework. Combined they accounted for 52 percent of the total variation. Time spent watching television was negatively related to achievement.

Hypothesis 2 which dealt with the effect of family characteristics on student achievement was rejected because a significant amount of the variance was explained. Number of possessions in the home, father's education, number of rooms in the home, parental school visits, and parental expectation accounted for 47 percent of the variance. Parental school visits had a negative relationship with achievement.

The percent of students enrolled in an academic program and the percent of students whose best friend planned to attend college were significantly and positively related to achievement. Therefore hypothesis 3 which dealt with peer-group characteristics and their effect on achievement was rejected. A total of 16 percent of the variance was explained.

The effect of teacher characteristics was tested and rejected in hypothesis 4. Even though only nine percent of

the variance was explained, all four variables studied were significant. Specifically, motivation, experience, and education had a positive effect while absenteeism had a negative effect.

Hypothesis 5 which dealt with the effect of school characteristics on achievement was rejected. Three of the five variables studied were significantly related to achievement. Level of disadvantageness and teacher turnover rate made a negative contribution and average daily attendance made a positive contribution. Together they accounted for 31 percent of the variance. Nonsignificant contributors were pupil-teacher ratio and number of library volumes.

Finally in hypothesis 6, all characteristics combined were studied. This hypothesis was rejected because seventeen of the twenty-eight variables were significant. Those variables which had a positive effect on achievement were number of possessions in the home, educational aspiration, high school grades, number of rooms in the home, locus-of-control, time spent on homework, teacher motivation, sex, family income, teacher's experience, and average daily attendance rate of the school. Those variables making significant negative contributions were parental expectation, level of disadvantageness of the

school, parental school visits, time spent watching television, teacher absenteeism, and mother's education. Together, they accounted for 65 percent of the variance.

The data were further analyzed to determine the unique effect of each block of variables (i.e., student, family, peer-group, teacher, school). It was found that the student characteristics had the greatest unique effect explaining 13 percent of the variance. Family characteristics explained, uniquely, four percent of the variance and teacher and school characteristics explained, uniquely, one percent each.

Within the auxiliary analysis section of this research, a model of high school achievement was presented and analyzed. In that model, it was hypothesized that family socioeconomic status, school conditions, teacher quality, and peer-group influence were directly and indirectly related to achievement while student aspirations were directly related. A test of the original model resulted in several revisions. The path between family socioeconomic status and achievement was eliminated. The path from teacher quality to peer-group influence was also eliminated. Finally, the paths from school conditions to teacher quality, peer-group influence, and student aspirations were eliminated. The final reduced model suggested that: 1)

family socioeconomic status had an indirect effect on achievement through its effect on school conditions, 2) school conditions had a direct effect on achievement, 3) teacher quality had both a direct effect on achievement and an indirect effect through student aspirations, 4) peer group had both a direct effect on achievement and an indirect effect through student aspirations, and 5) student aspirations had a direct effect. In the reduced model, 82 percent of the variance in the criterion, achievement, was explained as compared to 77 percent in the original model.

Discussion

The evidence from this research project supports the contentions that such school level variables as student characteristics, family characteristics, peer-group characteristics, teacher characteristics, and individual school characteristics do in fact have an influence on high school achievement. However, because of the "ecological fallacy" of inferring individual relationships from calculated aggregate relationships, no conclusions about the effect these variables have on individuals can be drawn. Robinson (1950, p. 357) points out that ecological correlations cannot be validly used as substitutes for individual correlations. He further states that the only

reasonable assumption is that an ecological correlation is almost certainly not equal to its corresponding individual correlation. Thus, the emphasis of this research was on the relationships of school variables to school effectiveness as measured by aggregated student achievement.

One general concern of educators has been the concern regarding the contributions made by a particular factor after controlling for other related factors. This study suggests that the student factor tends to be most important followed by the family. The school and teacher factors have less influence.

Certain factors have not only a direct effect on achievement but also an indirect effect. Specifically, variation in achievement can be explained directly by school conditions, peer-group influence, and student aspirations and indirectly by family socioeconomic status, teacher quality, and peer-group influence through student aspirations. It may also be explained indirectly by family socioeconomic status through both, teacher quality and student aspirations.

Recommendations for Future Research

Based upon the findings and insights gained from this research, the following recommendations for future research are made:

1. It is recommended that a study of this nature be replicated using the individual student as the unit of analysis. In certain cases it is very difficult to answer questions at one level with data aggregated at a different level.
2. An additional investigation should be conducted using a different selection of input variables from each area (i.e., student, family, peer-group, teacher, school) with the same output measures.
3. This study should be replicated using identical input variables with different measures of output.
4. Since only a recursive model was considered in this research, it is suggested that additional research be conducted utilizing a nonrecursive model to examine the effects of reciprocal causations.
5. Careful consideration must be given to the missing data problem. It causes a degree of uncertainty in the findings from a study. The researcher may not know whether the presence or absence of data would effect the outcome.

BIBLIOGRAPHY

Applied Scholastics, Inc. (1981, June). Growing concern over quality. U.S.A. Today, 109, 2433.

Bidwell, C. E., and Kasarda, J. D. (1975). School district organization and student achievement. American Sociological Review, 40, 55-70.

Biniaminov, I., and Glasman, N. (1983). School determinants of student achievement in secondary education. American Educational Research Journal, 20 (2), 251-268.

Bloom, B. S. (1976). Human characteristics and school learning. New York: McGraw Hill.

Boardman, A. E., Davis, O. A., and Sanday, P. R. (1973). A simultaneous equations model of the education process: The Coleman data revisited with an emphasis upon achievement. 1973 social statistics section proceedings of the American Statistical Association. Washington, DC: American Statistical Association.

Bowles, S. S. (1969). Educational production function: Final report. Washington, DC: U.S. Department of Health, Education, and Welfare, Office of Education.

Bowles, S. S. (1970). Towards an educational production function. In W. L. Hansen (Ed.), Education, income, and human capital. New York: Columbia University Press.

Brookover, W., Beady, C., Flood, P., Schweitzer, J., and Wisenbaker, J. (1979). School social systems and student achievement: Schools can make a difference. New York: Praeger.

Burkhead, J., Fox, T. G., and Holland, J. W. (1967). Input and output in large city schools. Syracuse, NY: Syracuse University Press.

Carroll, J. B. (1963). A model of school learning. Teachers College Record, 64, 723-733.

Centra, J. A., and Potter, D. A. (1980). School and teacher effects: An interrelational model. Review of Educational Research, 50, 273-291.

Cohn, E. (1968). Economies of scale in Iowa high school operations. Journal of Human Resources, 4, 422-434.

Cohn, E., and Millman, S. D. (1975). Input-Output analysis in public education. Cambridge, MA: Ballinger Publishing Company.

Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, S. M., Weinfeld, F. D., and York, R. L. (1966). Equality of educational opportunity. Washington, DC: U.S. Government Printing Office.

Cooley, W. W., and Leinhardt, G. (1975). The application of a model for investigating classroom processes. Pittsburgh, PA: University of Pittsburgh, Learning Research and Development Center.

Education Commission of the States, National Assessment of Educational Progress. (1975). Writing mechanics 1969-1974: A capsule description of change in writing mechanics (Report No. 05-W-01). Washington, DC: U.S. Government Printing Office.

Education Commission of the States, National Assessment of Educational Progress. (1975). Consumer math: Selected results from the first mathematics assessment (Report No. 04-MA-02). Washington, DC: U.S. Superintendent of Documents.

Gallup, A. (1984). The gallup poll of teachers' attitudes toward the public schools. Phi Delta Kappan, 66, 97-107.

Gardner, D. P., Larsen, Y. W., Baker, W. O., and Campbell, A. (1983). A nation at risk: The imperative for educational reform. An open letter to the American people. A report to the nation and the Secretary of Education (Stock No. 065-000-00177-2). Washington, DC: U.S. Government Printing Office.

Glasman, N., and Biniaminov, I. (1981). Input-output analyses of schools. Review of Educational Research, 51 (4), 509-539.

Guthrie, J. W., Kleindorfer, G. B., Levin, H. M., and Stout, R. T. (1971). Schools and inequality. Cambridge, MA: Massachusetts Institute of Technology Press.

Hanushek, E. A. (1972). Education and race: An analysis of the educational production process. Lexington, MA: Lexington Books.

Harnischfeger, A., and Wiley, D. E. (1976). The teaching-learning process in elementary schools: A synoptic view. Curriculum Inquiry, 6, 5-43.

Heyns, B., and Hilton, T. L. (1982). The cognitive tests for high school and beyond: An assessment. Sociology of Education, 55, 89-102.

Joreskog, K. G. (1969). A general approach to confirmatory maximum likelihood factor analysis. Psychometrica, 34, 183-202.

Joreskog, K. G. (1971). Statistical analysis of sets of congeneric tests. Psychometrica, 36, 109-134.

Joreskog, K. G., and Sorbom, D. (1981). LISREL VI: Analysis of linear structural relationships by the method of maximum likelihood. Chicago, ILL: International Educational Services.

Katzman, M. T. (1971). The political economy of urban schools. Cambridge, MA: Harvard University Press.

Kiesling, H. J. (1969). The relationship of school inputs to public school performance in New York State. Washington, DC: U.S. Department of Health, Education, and Welfare, Office of Education.

Levin, H. (1970). A new model of school effectiveness. In A. Mood (Ed.), Do teachers make a difference? Washington, DC: U.S. Government Printing Office.

Mayeske, G. W., and Beaton, A. E. (1975). Special studies of our nation's students. Washington, DC: U.S. Government Printing Office.

Mayeske, G. W., Cohen, W. M., Wisler, C. E., Okada, T., Beaton, A. E., Proshek, J. M., Weinfeld, F. D., and Tabler, K. A. (1972). A study of our nation's schools. Washington, DC: U.S. Government Printing Office.

Mayeske, G. W., Okada, T., and Beaton, A. E., (1973b). A study of the attitude toward life of our nation's students. Washington, DC: U.S. Government Printing Office.

Mayeske, G. W., Okada, T., Beaton, A. E., Cohen, W. M., and Wisler, C. E. (1973a). A study of the achievement of our nation's students. Washington, DC: U.S. Government Printing Office.

Michelson, S. (1970). The association of teacher resources with children's characteristics. In A. Mood (Ed.), Do teachers make a difference? A report on recent research on pupil achievement. Washington, DC: U.S. Government Printing Office.

Mollenkopf, W. G., and Melville, S. D. (1956). A study of secondary school characteristics as related to test scores. Princeton, NJ: Educational Testing Service.

Murnane, R. J. (1975). The impact of school resources on the learning of inner city children. Cambridge, MA: Ballinger Publishing Company.

National Center for Educational Statistics. (1981). NCES data tapes now available for high school and beyond (NCES 81-226a). Washington, DC: U.S. Department of Education.

National Center for Educational Statistics. (1984). Data tapes now available for transcript, offering and enrollment, and updated school files: High school and beyond (NCES 83-226t). Washington, DC: U.S. Department of Education.

National School Public Relations Association. (1976, December). Teachers and parents work for the basics. Washington, DC: National School Public Relations Association.

Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., and Bent, D. (1983). SPSSx: Statistical package for the social sciences. New York, NY: McGraw Hill Book Company.

Page, E. B., and Keith, T. Z. (1981). Effects of U.S. private schools: A technical analysis of two recent claims. Educational Researcher, 10 (7), 7-17.

Pedhazur, E. J. (1982). Multiple regression in behavioral research. New York: Holt, Rinehart, and Winston.

Perl, L. J. (1973). Family background, secondary school expenditure, and student ability. Journal of Human Resources, 8, 156-180.

Raymond, R. (1968). Determinants of the quality of primary and secondary public education in West Virginia. Journal of Human Resources, 3, 450-470.

Robinson, W. (1950). Ecological correlations and the behavior of individuals. American Sociological Review, 15, 351-357.

Rutter, M., Maughan, B., Mortimore, P., and Ouston, J. (1979). Fifteen thousand hours: Secondary schools and their effects on children. Cambridge, MA: Harvard University Press.

Shiels, M. (1975). Why Johnny can't write. Newsweek, 8, 57.

Summers, A. A., and Wolfe, B. L. (1977). Do schools make a difference? American Economic Review, 67, 639-652.

Tuckman, H. P. (1971). High school inputs and their contribution to school performance. Journal of Human Resources, 6, 490-509.

United States Department of Education. (1978). United States Statues at large. Washington, DC: U.S. Government Printing Office.

Walberg, H. J. (1981). In F. H. Farley and J. Gordon (Eds.), Psychology and education: The state of the union. Berkeley, CA: McCutchan.

Winkler, D. R. (1975). Educational achievement and school peer group composition. Journal of Human Resources, 10, 189-205.

Wolf, R. (1977). Achievement in America. New York: Teachers College Press.

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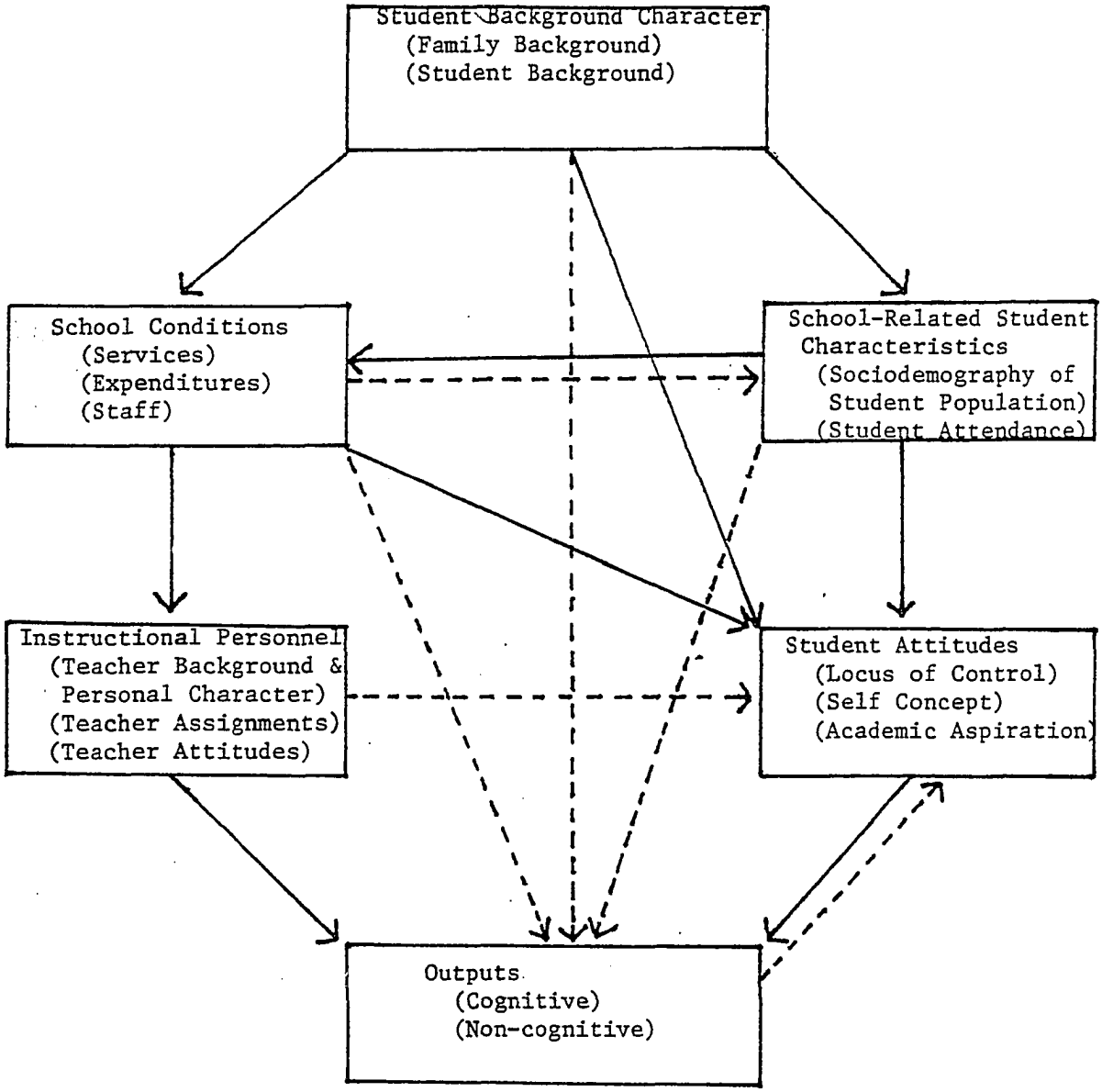
of this study. Without her understanding, the successful completion of this research project would have been very difficult.

Finally and most of all, I thank the Lord for sharing His grace with me.

APPENDIX A. STRUCTURAL MODEL

A SUGGESTED STRUCTURAL MODEL OF SCHOOL INPUT AND OUTPUT VARIABLES



LEGEND:
() Classification of Subgroups
→ Main Direct Effects
⇢ Secondary Direct Effects

Source: Review of Educational Research
Winter, 1981, Vol.51, No.4, Pp.509-539
Naftaly S. Glasman and Israel Biniaminov

APPENDIX B. STUDENT AND SCHOOL QUESTIONNAIRES

SO/Q 4278
1980

Form Approved
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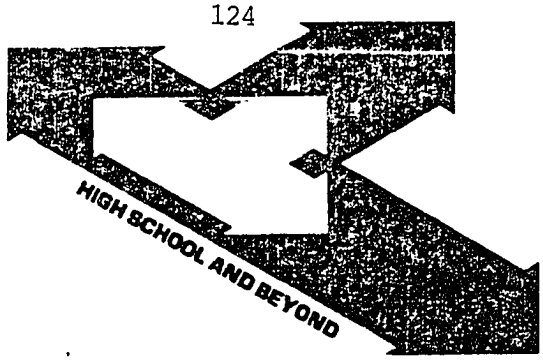
App. Exp: 12/80



High School and Beyond is sponsored by the National Center for Education Statistics, an agency of the United States Department of Education.

Thank you for accepting our invitation to participate in HIGH SCHOOL AND BEYOND. This is a voluntary but important national survey. We are pleased that you have agreed to participate. Your cooperation and participation will help us learn more about the experiences of high school students and their plans for the future.

All information which would permit identification of the individual will be held in strict confidence, will be used only by persons engaged in and for the purposes of this survey, and will not be disclosed or released to others for any purposes except as required by law.

SOPHOMORE QUESTIONNAIRE

STATE:

SCHOOL NO:

STUDENT NO:

Prepared for the National Center for Education Statistics by the National Opinion Research Center
NCES Form 2409-01

WE HOPE YOU WILL ANSWER EVERY QUESTION, BUT YOU MAY SKIP ANY QUESTION YOU DO NOT WISH TO ANSWER.

1. **Which of the following best describes your present high school program? (MARK ONE)**

- General ..... O
- Academic or college preparatory ..... O
- Vocational (Occupational preparation)
  - Agricultural occupations ..... O
  - Business or office occupations ..... O
  - Distributive education ..... O
  - Health occupations ..... O
  - Home economics occupations ..... O
  - Technical occupations ..... O
  - Trade or industrial occupations ..... O

2. **Were you assigned to the program you are now in, or did you choose it yourself? (MARK ONE)**

- I was assigned ..... O
- I chose it myself ..... O

3. **Do you expect to graduate from high school? (MARK ONE)**

- Yes ..... O
- Probably ..... O
- Probably not ..... O
- No ..... O

4. **When do you expect to leave high school? (MARK ONE)**

- Before the beginning of the next school year (Before September 1980) ..... O
- During the next school year (September 1980 to June 1981) ..... O
- After June 1981 but before graduation ..... O
- After I graduate ..... O

5. **Do you have a definite job lined up after you leave high school? (MARK ONE)**

- Yes ..... O
- No ..... O

82. **Suppose a friend asked you about information on methods of birth control. How much information would you be able to give him/her? (MARK ONE)**

- Very little ..... O
- Some ..... O
- A lot ..... O

83. **Which of the following is your most important source of information about methods of birth control? (MARK ONE)**

- School courses on sex (family) education ..... O
- Talking with my father or mother ..... O
- Talking with friends ..... O
- Books and magazines I have read ..... O
- Clinic or agency ..... O
- I don't know about methods of birth control ..... O

Background information . . .

84. **Sex:**
(MARK ONE)

- Male ..... O
- Female ..... O

85. **Age:**
(MARK ONE)

13 or younger	14	15	16	17	18	19	20	21 or older
O	O	O	O	O	O	O	O	O

86. **Height:**
(MARK THE OVALS WHICH INDICATE YOUR HEIGHT IN FEET AND INCHES)

	3	4	5	6	7
Feet:	O	O	O	O	O

	0	1	2	3	4	5	6	7	8	9	10	11
Inches:	O	O	O	O	O	O	O	O	O	O	O	O

SO/Q
1982 FU-1

Form Approved
O.M.B. No. 1850-0088
App. Exp.: 9/30/82

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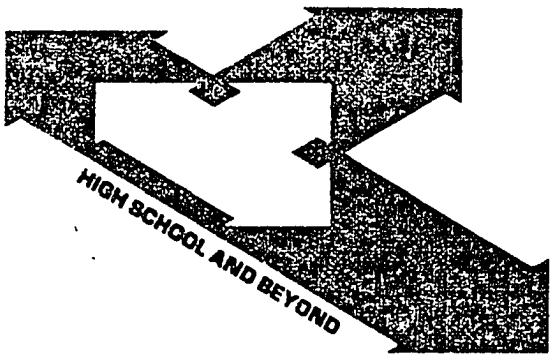


1980 SOPHOMORE COHORT
FIRST FOLLOW-UP QUESTIONNAIRE

Dear Participant:

Thank you for accepting our invitation to continue your participation in High School and Beyond. Through completion of this questionnaire, valuable information obtained from young people themselves can be used by policymakers to improve the education system for future students. Their goal is to prepare students for productive and meaningful roles in an increasingly complex and changing society.

ID #: ☐☐☐☐-☐☐-☐

NAME:

First_____

Last_____

Prepared for
THE NATIONAL CENTER FOR EDUCATION STATISTICS
by
THE NATIONAL OPINION RESEARCH CENTER

ED(NCES) Form No. 2409-30A Part I

WE HOPE YOU WILL ANSWER EVERY QUESTION, BUT YOU MAY SKIP ANY QUESTION YOU DO NOT WISH TO ANSWER.

1. When do you expect to graduate from high school? (MARK ONE)

- I will leave high school before I graduate ○
- Now through June 1982 ○
- July or August 1982 ○
- September 1982 through January 1983 ○
- February through June 1983 ○
- After June 1983 ○

2. Which of the following best describes your present high school program? (MARK ONE)

- General ○
- Academic or college preparatory ○
- Vocational (Occupational preparation)
  - Agricultural occupations ○
  - Business or office occupations ○
  - Distributive education ○
  - Health occupations ○
  - Home economics occupations ○
  - Technical occupations ○
  - Trade or industrial occupations ○

3. How did you get into this program? (MARK ALL THAT APPLY)

a. I was assigned ○
b. I chose it after talking to my counselor or teacher ○
c. I chose it after talking to my parents ○
d. I chose it after talking to my friends ○
e. I chose it myself—did not consult anyone ○
f. This is the only program offered in school ○

6. **Have you taken any high school courses in the following areas which have equipped you for a beginning job in that area? (MARK ONE OVAL FOR EACH LINE)**

	Yes	No
a. Agriculture, including horticulture	O	O
b. Auto mechanics	O	O
c. Commercial arts	O	O
d. Computer programming or computer operations	O	O
e. Construction trades:		
1. Carpentry, cabinetmaking, or millwork	O	O
2. Electrical	O	O
3. Masonry	O	O
4. Plumbing	O	O
f. Cosmetology, hairdressing, or barbering	O	O
g. Drafting	O	O
h. Electronics	O	O
i. Home economics, including dietetics and child care	O	O
j. Machine shop	O	O
k. Medical or dental assisting	O	O
l. Practical nursing	O	O
m. Quantity food occupations	O	O
n. Sales or merchandising	O	O
o. Secretarial, stenographic, typing, or other office work	O	O
p. Welding	O	O
q. Other (WRITE IN) _____	O	O

7. **Which of the following best describes your grades so far in high school? (MARK ONE)**

O

- Mostly A (a numerical average of 90-100) O
- About half A and half B (85-89) O
- Mostly B (80-84) O
- About half B and half C (75-79) O
- Mostly C (70-74) O
- About half C and half D (65-69) O
- Mostly D (60-64) O
- Mostly below D (below 60) O

8. **Have you taken any of the following tests this school year, or last year (or both)? (MARK ONE OVAL FOR EACH LINE)**

	Yes, both this year and last year	Yes, before June 1, 1981	Yes, on or after June 1, 1981	No, did not take
a. College Board SAT test	O	O	O	O
b. ACT test	O	O	O	O
c. Armed Services Vocational Aptitude Battery (ASVAB)	O	O	O	O

12. What was the first language you spoke when you were a child? (MARK ONE)

- English ... (SKIP TO Q. 15)
- Spanish
- Italian
- Chinese
- French
- German
- Greek
- Portuguese
- Filipino languages
- Polish

Other (WRITE IN) _____

13. Did you have the following courses in *grades 10-12*? (MARK ONE OVAL FOR EACH LINE)

Did you have . . .	Yes	No
a. An English course designed for students from non-English speaking backgrounds		
b. Reading and writing in your first language		
c. Other subjects, such as math or science, taught, at least in part, in your first language		
d. Courses in the history and culture of your ancestors' country of origin or their life in the United States		

14. Thinking about *all* the courses you had in grades 10 through 12, how much of the teaching was done in your first language? (MARK ONE)

- All or almost all of the teaching was done in that language
- Most was in that language
- About half was in that language
- Some was in that language
- None was in that language

15. Approximately what is the average amount of time you spend on homework a week? (MARK ONE)

- No homework is ever assigned
- I have homework, but I don't do it
- Less than 1 hour a week
- Between 1 and 3 hours a week
- More than 3 hours, less than 5 hours a week
- 5 hours or more, but less than 10 hours a week
- 10 hours or more, but less than 15 hours a week
- 15 hours or more a week

The next questions ask about your parents or guardians. If you have *both* a natural father and a stepfather or other male guardian, answer for the one who lives in the same household with you. Similarly, if you have *both* a natural mother and a stepmother or other female guardian, answer for the one who lives in the same household with you.

Please answer for the same persons in later questions that ask about your father or mother.

53. **Please describe below the job most recently held by your father (stepfather or male guardian), even if he is not working at present.**

(WRITE IN) _____

A. Which of the categories below comes closest to describing that job? (MARK ONE)

CLERICAL such as bank teller, bookkeeper, secretary, typist, mail carrier, ticket agent ○
CRAFTSMAN such as baker, automobile mechanic, machinist, painter, plumber, telephone installer, carpenter ○
FARMER, FARM MANAGER ○
HOMEMAKER (without other job) ○
LABORER such as construction worker, car washer, sanitary worker, farm laborer ○
MANAGER, ADMINISTRATOR such as sales manager, office manager, school administrator, buyer, restaurant manager, government official ○
MILITARY such as career officer, enlisted man in the Armed Forces ○
OPERATIVE such as meat cutter, assembler, machine operator, welder, taxicab, bus or truck driver ○
PROFESSIONAL such as accountant, artist, registered nurse, engineer, librarian, writer, social worker, actor, athlete, politician, but not including school teacher ○
PROFESSIONAL such as clergyman, dentist, physician, lawyer, scientist, college teacher ○
PROPRIETOR OR OWNER such as owner of a small business, contractor, restaurant owner ○
PROTECTIVE SERVICE such as detective, police officer or guard, sheriff, fire fighter ○
SALES such as salesperson, advertising or insurance agent, real estate broker ○
SCHOOL TEACHER such as elementary or secondary ○
SERVICE such as barber, beautician, practical nurse, private household worker, janitor, waiter ○
TECHNICAL such as draftsman, medical or dental technician, computer programmer ○
Never worked ○
Don't know ○

54. **Please describe below the job most recently held by your mother (stepmother or female guardian), even if she is not working at present.**

(WRITE IN) _____

A. Which of the categories below comes closest to describing that job? (MARK ONE)

- CLERICAL such as bank teller, bookkeeper, secretary, typist, mail carrier, ticket agent
- CRAFTSMAN such as baker, automobile mechanic, machinist, painter, plumber, telephone installer, carpenter
- FARMER, FARM MANAGER
- HOMEMAKER (without other job)
- LABORER such as construction worker, car washer, sanitary worker, farm laborer
- MANAGER, ADMINISTRATOR such as sales manager, office manager, school administrator, buyer, restaurant manager, government official
- MILITARY such as career officer, enlisted woman in the Armed Forces
- OPERATIVE such as meat cutter, assembler, machine operator, welder, taxicab, bus or truck driver
- PROFESSIONAL such as accountant, artist, registered nurse, engineer, librarian, writer, social worker, actress, athlete, politician, but not including school teacher
- PROFESSIONAL such as clergyman, dentist, physician, lawyer, scientist, college teacher
- PROPRIETOR OR OWNER such as owner of a small business, contractor, restaurant owner
- PROTECTIVE SERVICE such as detective, police officer or guard, sheriff, fire fighter
- SALES such as salesperson, advertising or insurance agent, real estate broker
- SCHOOL TEACHER such as elementary or secondary
- SERVICE such as barber, beautician, practical nurse, private household worker, janitor, waitress
- TECHNICAL such as draftsman, medical or dental technician, computer programmer
- Never worked
- Don't know

55. **What was the highest level of education your father (stepfather or male guardian) completed? (MARK ONE)**

- Less than high school graduation
- High school graduation only
- Vocational, trade, or business school after high school
  - Less than two years
  - Two years or more
- College program
  - Less than two years of college
  - Two or more years of college (including two-year degree)
  - Finished college (four- or five-year degree)
  - Master's degree or equivalent
  - Ph.D., M.D., or other advanced professional degree
- Don't know

56. What was the highest level of education your mother (stepmother or female guardian) completed? (MARK ONE)

- Less than high school graduation
- High school graduation only
- Vocational, trade, or business school after high school
  - Less than two years
  - Two years or more
- College program
  - Less than two years of college
  - Two or more years of college (including two-year degree)
  - Finished college (four- or five-year degree)
  - Master's degree or equivalent
  - Ph.D., M.D., or other advanced professional degree
- Don't know

57. Are the following statements about your parents true or false? (MARK ONE OVAL FOR EACH LINE)

	True	False	Does not apply
a. My mother (stepmother or female guardian) keeps close track of how well I am doing in school			
b. My father (stepfather or male guardian) keeps close track of how well I am doing in school			
c. My parents (or guardians) almost always know where I am and what I'm doing			

58. Since the beginning of this school year, how often have your parents (or guardians) participated in the following activities? (MARK ONE OVAL FOR EACH LINE)

	Never	Once in a while	Often
a. Attended a PTA meeting			
b. Attended a parent-teacher conference			
c. Visited classes			
d. Phoned or saw a teacher, counselor or principal when you had a problem			
e. Did volunteer work such as fund raising or assisting on school projects			

59. **Before you started high school were you ever asked to repeat a grade or held back a term in school? (MARK ONE)**

Yes ..... (ANSWER A)
No ..... (GO TO Q. 60)

A. Which grades did you repeat? (MARK ALL THAT APPLY)

a. First .....
b. Second .....
c. Third .....
d. Fourth .....
e. Fifth .....
f. Sixth .....
g. Seventh .....
h. Eighth .....
i. Ninth .....

60. **How often do you spend time on the following activities outside of school? (MARK ONE OVAL FOR EACH LINE)**

	Rarely or never	Less than once a week	Once or twice a week	Every day or almost every day
a. Spending time talking with friends				
b. Reading for pleasure				
c. Going out on dates				
d. Just driving or riding around (alone or with friends)				
e. Thinking or daydreaming alone				
f. Talking with your mother or father				
g. Reading the front page of the newspaper				

61. **During weekdays about how many hours *per day* do you watch TV? (MARK ONE)**

Don't watch TV during weekdays .....
Less than 1 hour .....
1 hour or more, less than 2 .....
2 hours or more, less than 3 .....
3 hours or more, less than 4 .....
4 hours or more, less than 5 .....
5 hours or more .....

62. How much has each of the following persons influenced your plans for after high school? (MARK ONE OVAL FOR EACH LINE)

	Not at all	Somewhat	A great deal
a. Your father	○	○	○
b. Your mother	○	○	○
c. A guidance counselor	○	○	○
d. Teachers	○	○	○
e. Friends or relatives about your own age	○	○	○
f. Military recruiters	○	○	○
g. College recruiters	○	○	○

63. What do the following people think you ought to do after high school? (MARK ONE OVAL FOR EACH LINE)

	Go to college	Get a full-time job	Enter a trade school or an apprenticeship	Enter military service	They don't care	I don't know	Does not apply
a. Your father	○	○	○	○	○	○	○
b. Your mother	○	○	○	○	○	○	○
c. A guidance counselor	○	○	○	○	○	○	○
d. Teachers	○	○	○	○	○	○	○
e. Friends or relatives about your own age	○	○	○	○	○	○	○

64. Please think of your closest friend in this school who is a senior. As far as you know, are the following statements true or false for him or her? (MARK ONE OVAL FOR EACH LINE)

	True	False
a. Gets good grades	○	○
b. Is interested in school	○	○
c. Attends classes regularly	○	○
d. Plans to go to college	○	○
e. Is popular with others	○	○

65. Do you know how to ... (MARK ONE OVAL FOR EACH LINE)

	Yes	Not sure	No
a. Apply for an office job in a big company?	○	○	○
b. Choose a school program which will help you in college?	○	○	○
c. Apply to a college for admission?	○	○	○
d. Find out about different kinds of jobs?	○	○	○
e. Arrange a bus, train or plane trip to go out of town?	○	○	○

75. How do you feel about each of the following statements? (MARK ONE OVAL FOR EACH LINE)

	Agree strongly	Agree	Disagree	Disagree strongly	No opinion
a. I take a positive attitude toward myself	○	○	○	○	○
b. Good luck is more important than hard work for success	○	○	○	○	○
c. I feel I am a person of worth; on an equal plane with others	○	○	○	○	○
d. I am able to do things as well as most other people	○	○	○	○	○
e. Every time I try to get ahead, something or somebody stops me	○	○	○	○	○
f. Planning only makes a person unhappy, since plans hardly ever work out anyway	○	○	○	○	○
g. People who accept their condition in life are happier than those who try to change things	○	○	○	○	○
h. On the whole, I am satisfied with myself	○	○	○	○	○
i. What happens to me is my own doing	○	○	○	○	○
j. At times I think I am no good at all	○	○	○	○	○
k. When I make plans, I am almost certain I can make them work	○	○	○	○	○
l. I feel I do not have much to be proud of	○	○	○	○	○

76. Are the following statements about yourself true or false? (MARK ONE OVAL FOR EACH LINE)

	True	False
a. I have been in serious trouble with the law	○	○
b. I am overweight	○	○
c. Others think of me as physically unattractive	○	○
d. I am popular with other students in my class	○	○
e. I like to work hard in school	○	○
f. I enjoy working for pay	○	○
g. I will be disappointed if I don't graduate from college	○	○

77. **Write in here the name of the job or occupation that you expect or plan to have when you are 30 years old. Even if you are not at all sure, write in your best guess.**

(WRITE IN) _____

A. Which of the categories below comes closest to describing that job? (MARK ONE)

CLERICAL such as bank teller, bookkeeper, secretary, typist, mail carrier, ticket agent ○
CRAFTSMAN such as baker, automobile mechanic, machinist, painter, plumber, telephone installer, carpenter ○
FARMER, FARM MANAGER ○
HOMEMAKER (without other job) ○
LABORER such as construction worker, car washer, sanitary worker, farm laborer ○
MANAGER, ADMINISTRATOR such as sales manager, office manager, school administrator, buyer, restaurant manager, government official ○
MILITARY such as career officer, enlisted man or woman in the Armed Forces ○
OPERATIVE such as meat cutter, assembler, machine operator, welder, taxicab, bus, or truck driver ○
PROFESSIONAL such as accountant, artist, registered nurse, engineer, librarian, writer, social worker, actor, actress, athlete, politician, but not including school teacher ○
PROFESSIONAL such as clergyman, dentist, physician, lawyer, scientist, college teacher ○
PROPRIETOR OR OWNER such as owner of a small business, contractor, restaurant owner ○
PROTECTIVE SERVICE such as detective, police officer or guard, sheriff, fire fighter ○
SALES such as salesperson, advertising or insurance agent, real estate broker ○
SCHOOL TEACHER such as elementary or secondary ○
SERVICE such as barber, beautician, practical nurse, private household worker, janitor, waiter, waitress ○
TECHNICAL such as draftsman, medical or dental technician, computer programmer ○
NOT WORKING ○

78. How important was each of the following factors in determining the kind of work you plan to be doing for most of your life? (MARK ONE OVAL FOR EACH LINE)

	Not important	Somewhat important	Very important
a. Previous work experience in the area	○	○	○
b. Good income to start or within a few years	○	○	○
c. Job security and permanence	○	○	○
d. Work that seems important and interesting to me	○	○	○
e. Freedom to make my own decisions	○	○	○
f. Meeting and working with sociable, friendly people	○	○	○

79. Would you be willing to move from this town or city in order to get a job you want? (MARK ONE)

- Yes, I would prefer to move away ○
- Yes, it makes no difference to me ○
- Yes, but I would prefer to find work in this community ○
- No, I am not willing to move ○

80. As things stand now, how far in school do you think you will get? (MARK ONE)

○

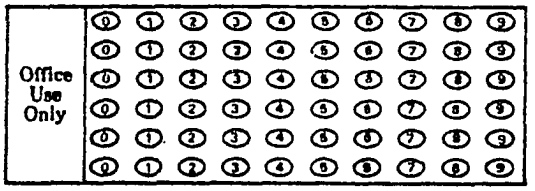
- Less than high school graduation ○
- High school graduation only ○
- Vocational, trade, or business school after high school
  - Less than two years ○
  - Two years or more ○
- College program
  - Less than two years of college ○
  - Two or more years of college (including two-year degree) ○
  - Finished college (four- or five-year degree) ○
  - Master's degree or equivalent ○
  - Ph.D., M.D., or other advanced professional degree ○
- Don't know ○

81. How far in school do you think your parents want you to go? (MARK ONE)

- Less than high school graduation ○
- High school graduation only ○
- Vocational, trade, or business school after high school
  - Less than two years ○
  - Two years or more ○
- College program
  - Less than two years of college ○
  - Two or more years of college (including two-year degree) ○
  - Finished college (four- or five-year degree) ○
  - Master's degree or equivalent ○
  - Ph.D., M.D., or other advanced professional degree ○
- Don't know ○

105. What is your birthdate? (WRITE IN)

MONTH		DAY		YEAR	



106. How many brothers and sisters do you have? Please include stepbrothers and stepsisters if they live or have lived in your home. (MARK ONE)

- None ○
- One ○
- Two ○
- Three ○
- Four ○
- Five ○
- Six or more ○

107. How many of your brothers and sisters are *older* than you are? Please include stepbrothers and stepsisters if they live, or have lived in your home. (MARK ONE)

- None ○
- One ○
- Two ○
- Three ○
- Four ○
- Five ○
- Six or more ○

108. How many of your brothers and sisters will be in college next fall? (Please include stepbrothers or stepsisters if they live in your parents' home.) (MARK ONE)

- I don't have any brothers or sisters ○
- None ○
- One ○
- Two or more ○

109. **How many of your brothers and sisters will be in high school next fall? (Please include stepbrothers or stepsisters if they live in your parents' home.) (MARK ONE)**

- I don't have any brothers or sisters ○
- None ○
- One ○
- Two or more ○

110. **American families are divided below into three equal groups according to how much money the family makes in a year. Mark the oval for the group which comes closest to the amount of money your family makes in a year. (MARK ONE)**

- One-third of American families make: $14,999 or less ○
- One-third of American families make: $15,000 to $29,999 ○
- One-third of American families make: $30,000 or more ○

111. **This time families are divided into eight groups according to how much money they make in a year. Mark the oval for the group which comes closest to the amount of money your family makes in a year. (MARK ONE)**

- $7,999 or less ○
- $8,000 to $14,999 ○
- $15,000 to $19,999 ○
- $20,000 to $24,999 ○
- $25,000 to $29,999 ○
- $30,000 to $39,999 ○
- $40,000 to $49,999 ○
- $50,000 or more ○

112. **How many rooms are there in your home? Count only the rooms your family lives in. Count the kitchen (if separate) but *not* bathrooms. (MARK ONE)**

- 1 room ○
- 2 rooms ○
- 3 rooms ○
- 4 rooms ○
- 5 rooms ○
- 6 rooms ○
- 7 rooms ○
- 8 rooms ○
- 9 rooms ○
- 10 or more ○

113. Which of the following do you have in your home?
(MARK ONE OVAL FOR EACH LINE)

	Have	Do not have
a. A specific place for study	O	O
b. A daily newspaper	O	O
c. Encyclopedia or other reference books	O	O
d. Typewriter	O	O
e. Electric dishwasher	O	O
f. Two or more cars or trucks that run	O	O
g. More than 50 books	O	O
h. A room of your own	O	O
i. Pocket calculator	O	O
j. Color TV	O	O
k. Microcomputer or minicomputer	O	O
l. Video tape recorder	O	O
m. Video disc machine	O	O

114. What kind of school did you attend when you were in each of the following grades?
(MARK ONE OVAL FOR EACH LINE)

	Public	Catholic	Other religious	Other private
a. First grade	O	O	O	O
b. Second grade	O	O	O	O
c. Third grade	O	O	O	O
d. Fourth grade	O	O	O	O
e. Fifth grade	O	O	O	O
f. Sixth grade	O	O	O	O
g. Seventh grade	O	O	O	O
h. Eighth grade	O	O	O	O
i. Ninth grade	O	O	O	O

115. If you go to college, will it most likely be ... (MARK ONE)

A four-year college or university? O
A two-year junior or community college? O

116. If you go to college, will you most likely go to ... (MARK ONE)

A public college or university? O
A private college or university? O

117. If you go to college, will you probably go ... (MARK ONE)

In this state? O
In another state? O

118. If you go to college, will you probably go ... (MARK ONE)

Full-time? O
Part-time? O

SQ 4278
1980

Form Approved
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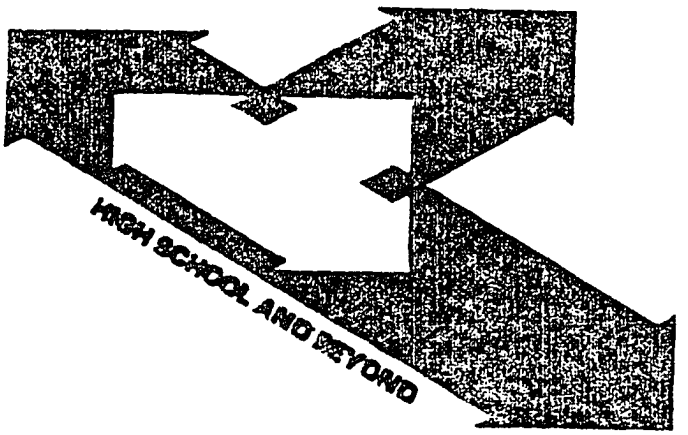

HIGH SCHOOL AND BEYOND is sponsored by the National Center for Education Statistics, an agency of the United States Department of Education.

SCHOOL QUESTIONNAIRE

The National Center for Education Statistics is authorized by Section 406 of the General Education Provisions Act (20 USC 1221e-1) to request participating schools to respond to this questionnaire. While you are not required to respond, your cooperation is needed to provide school information which will be used to aid in the interpretation of data about students in the survey, HIGH SCHOOL AND BEYOND.

All information which would permit identification of the school or of the individual person(s) filling out this form will be held in strict confidence, will be used only by persons engaged in and for the purposes of this survey, and will not be disclosed or released to others for any purposes except as required by law.

	01-02/		03-07/
STATE		SCHOOL	

Title of Respondent: _____

Date filled out: _____

Prepared for
THE NATIONAL CENTER FOR EDUCATION STATISTICS
by
THE NATIONAL OPINION RESEARCH CENTER

NCES Form 2409-13

PLEASE NOTE: Some schools may have supplied information identical to that requested in questions marked with an asterisk (*). If you have supplied the information for the same time period, it is not necessary to provide it. NORC staff may check with you about this. However, it would help us greatly if you would provide the information again in this questionnaire.

*1. A. What is the lowest grade included at your school? (CIRCLE ONE)

PK K 1 2 3 4 5 6 7 8 9 10 11 12

B. What is the highest grade (or year) at your school? (CIRCLE ONE)

10 11 12

NOTE: THE QUESTIONS WHICH FOLLOW CONCERN YOUR HIGH SCHOOL. IF YOUR SCHOOL INCLUDES OTHER GRADES ALONG WITH HIGH SCHOOL, PLEASE ANSWER IN TERMS OF YOUR HIGH SCHOOL ONLY.

*2. As of October 1, 1980 (or the nearest date for which data are available), what was the total membership of your high school, and what were the memberships in grades 10 and 12? (IF NONE, WRITE "0")

Total high school membership	Grade 10	Grade 12
_____	_____	_____

---

3. Is your high school a general (comprehensive) high school, or is it specialized in some way? (That is, is it organized for special purposes, or around a special group of students?) (CIRCLE ONE)

General (comprehensive) high school 1

Vocational high school 2

(Which occupations?) _____

_____

School for the physically handicapped 3

(Which types of handicap?) _____

_____

School for educationally or emotionally handicapped 4

Other (Please describe) _____

_____ 5

---

4. What was the total number of students graduated from the 12th grade in the 1978-1979 school year? (IF NONE, WRITE "0")

_____

5. How many days are in your school year? _____

6. How many minutes long are your standard class periods? _____

7. How many standard class periods are there in a day? _____

   A. During how many of these class periods does the average student have classes (not study hall, lunch periods, etc.)?

   _____

8. What is the approximate average daily percentage attendance in your high school?

   _____ %

9. Approximately what percentages of your current high school students and current faculty are members of the following groups? (IF NONE, WRITE "0")

	Students	Faculty
1) American Indian or Alaska Native	_____%	_____%
2) Asian or Pacific Islander (includes: Chinese, Japanese, Filipino, Korean, Vietnamese, Asian Indian, or other Asian)	_____%	_____%
3) Hispanic - of Spanish or Latin American origin	_____%	_____%
4) Black, not of Hispanic origin	_____%	_____%
5) White, not of Hispanic origin	_____%	_____%

(ENTRIES SHOULD TOTAL TO 100%)

10. About what percentage of your high school students speak a language other than English at home? (IF NONE, WRITE "0")

    _____ %

11. To the best of your knowledge, about what percentage of the entire 1978-1979 graduating class is now enrolled in a regular two-year or four-year college?

    _____ %

25. Does the school have a specific remedial program for students who fail the test? (CIRCLE ONE)

School does not have such a test 0
Yes, specific remedial program 1
No, no such program 2

---

26. In what year was this test first required in this school?

Year: 19 ☐☐
School does not have such a test 90
Test not required 91

---

27. Which of these facilities are available at your school? (CIRCLE AS MANY NUMBERS AS APPLY)

a. Indoor lounge for students 1
b. Career information center 2
c. Occupational training center 3
d. Media production facilities 4
e. Remedial reading and/or remedial mathematics laboratory 5
f. Subject area resources center(s) other than central library 1
g. Departmental offices 2
h. Teaching resources center for teachers' use 3
i. Child care or nursery school facility 4
j. Student cafeteria 5

---

*28. What is the approximate number of catalogued volumes in the school library?

Number of volumes: _____
No library 0

36. Please indicate whether or not your school uses each of the following criteria to classify students as disadvantaged. (CIRCLE ONE NUMBER ON EACH LINE)

	Yes	No
Federal guidelines	1	2
State guidelines	1	2
Other means	1	2

37. About what percentage of the students in your high school are classified as disadvantaged? (IF NONE, WRITE "0")

_____ %

38. Approximately how many colleges sent a representative to talk with interested students in this high school during the 1978-1979 school year? (CIRCLE ONE)

None 01
1 or 2 02
3 to 5 03
6 to 10 04
11 to 20 05
21 or more 06

39. Please indicate the size of your high school's staff in each of the following categories. (ENTER NUMBER OR ZERO ON EACH LINE)

	Number of full-time (or full-time equivalent) personnel
a. Assistant principals and deans	_____
b. Counselors	_____
c. Classroom teachers	_____
d. Curriculum specialists	_____
e. Remedial specialists	_____
f. Librarians/media specialists	_____
g. Psychologists	_____
h. Teaching aides	_____
i. Student teachers	_____
j. Volunteers	_____
k. Contributed services	_____
l. Security guards	_____

40. About what percentage of the professional (teaching and non-teaching) staff at your high school are female? (IF NONE, WRITE "0")

_____ %

41. About what percentage of the students are female? (IF NONE, WRITE "0")

_____ %

42. About what percentage of the full-time high school teachers have Master's or Doctor's degrees?

_____ %

43. What percentage of full-time high school teachers in this school at the end of the 1978-1979 school year have since left for reasons other than death or retirement?

_____ %

44. What is the approximate average daily percentage of teacher absenteeism in your high school?

_____ %

45. About what percentage of your teaching staff has been at your school for ten years or more?

_____ %

46. Approximately what percentage of the teachers in your high school live within 5 miles of this school?

_____ %

47. In your school, what is the first step on an annual salary contract schedule for a beginning certified teacher with a bachelor's degree?

$ _____

55. Which of the following best describes the practices for assignment of pupils to your high school? (CIRCLE ONE)

All pupils in a particular geographic area (or district) attend this school 01

Pupils in this particular geographic area (or district) are generally assigned to this school but transfers are frequently allowed 02

Pupils are assigned to this school on the basis of an entrance test or another achievement criterion 03

Pupils are assigned from particular areas in order to achieve a desired racial or ethnic composition in the school . 04

Other (SPECIFY) _____ 05

Private school, does not apply 06

56. To what degree is each of these matters a problem in your high school? (CIRCLE ONE NUMBER ON EACH LINE)

	Serious	Moderate	Minor	Not at all
a. Student absenteeism	1	2	3	4
b. Students' cutting classes	1	2	3	4
c. Parents' lack of interest in students' progress	1	2	3	4
d. Parents' lack of interest in school matters	1	2	3	4
e. Teacher absenteeism	1	2	3	4
f. Teachers' lack of commitment or motivation	1	2	3	4
g. Physical conflicts among students	1	2	3	4
h. Conflicts between students and teachers	1	2	3	4
i. Robbery or theft	1	2	3	4
j. Vandalism of school property	1	2	3	4
k. Student use of drugs or alcohol	1	2	3	4
l. Rape or attempted rape	1	2	3	4
m. Student possession of weapons	1	2	3	4
n. Verbal abuse of teachers	1	2	3	4