

1987

A path analytical approach to parents and teacher expectation effects on achievement for middle school students

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Lee, Joon Ok, Ph.D.

Iowa State University, 1987

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A path analytical approach to parents and teacher
expectation effects on achievement
for middle school students

by

Joon Ok Lee

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
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INTRODUCTION

The quality of education provided for children and adolescents is a major concern in any modern society. However, the level of achievement in basic skills and other areas of student behavior has been less than satisfactory in many American schools (Brookover et al., 1982). Since Sputnik was launched in 1957, there has been a considerable reflection about school education in U. S. A. Among other empirical studies, the so-called Coleman report (Coleman et al., 1966), Equality of Educational Opportunity, raised a widespread skepticism regarding the effectiveness of school in one way and led to heated controversies over its findings and its methodological approach. The nation-wide investigation found that "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 in a survey of this magnitude" (p. 316). One controversial conclusion drawn from the findings was that family background such as socioeconomic status is much more important than school characteristics in accounting for variation in children's achievement.

Moreover, the National Commission on Excellence in Education (1983) has diagnosed American society and its educational institutions as having "lost sight of the basic purposes of schooling, and of high expectations and disciplined effort needed to obtain them" (pp. 5-6). Then the Commission listed a dozen of indicators of the risks in American education and provided extensive recommendations in the pursuit of educational excellences, mostly related to high school and college education. Educators, however, believe that the crucial ages are the early ones in preparing basic learning skills by elementary and middle school students: Excellence in higher education, in great measure, depends upon the quality of lower level of schooling. It is rarely possible to expect that a student can reach a high level of achievement in a high school or college without mastering the prerequisite basic skills in elementary and middle school. Therefore, there is a need of systematic analysis of effects on pre-adolescents' school learning so as to gain an insight in possible provisions for educational excellence in lower level of school education.

Reaction to existing conditions, not only to the growing demands have been made by the general public for the accountability of schools, but has also stimulated an effective school movement. Many policy makers and practitioners have been involved in school improvement. To

help them to obtain their purposes and to foster a strong relationship between researchers and practitioners, during the past decade more significant efforts (e.g., Brookover et al., 1982; Department of Education, 1986; Kyle, 1985) have been made than ever before. They provide practical knowledge about how best to teach and to improve learning. However, we have yet, to develop full understanding of what goes by the name of "educational process"; that is, the dynamic relationships between environmental conditions and school learning.

The present study was designed to investigate the causal relationships between selected environmental variables of the home and school that might influence school learning. More specifically, the purpose of this study was twofold: one to identify the nature of relationships of structural, attitudinal, and process variables of the home and school with student attitudes, behaviors, and performances and the other to test the hypothetical path models of expectation effects on student learning in middle school. This study included structural, attitudinal, and process dimensions of both home and school environments. Student attitudes, learning behaviors, and academic achievement were included as dependent variables of total environmental process. A knowledge of causal relationships between environmental variables and school learning and that of relative strengths

of the relationships can be of great practical significance from the view point of the early identification of potential problems related to the environmental effects. These findings here, therefore, will also serve to increase understanding of the factors which contribute to improving the quality schooling for the students.

Theoretical framework

Environmental factors have been acknowledged to be central to theories of school learning and cognitive development and thus considerable numbers of empirical studies have sought to identify the environmental variables influencing school learning. Three dimensions of the educational environment have been identified in the previous studies and other related literature: structural, attitudinal, and process (Keeves, 1972; Thompson, 1985). In his research, Keeves (1972) has attempted to conceptualize the educational environments including the home, school, and peer into these three dimensions and illustrated the interrelationships among them and their causal links to student performance.

The structural dimension of educational environment is mainly composed of socio-demographic variables such as family size and income, ethnicity, birth order, parents' marital status, education, and occupation, etc., and the physical

characteristics of the home such as the type and quality of the housing in the study of the home environment and in the study of the school environment such as; type of school, location, size of school or class, average expenditure per student, facilities and equipment, teacher backgrounds, characteristics of the student body, etc. All these are classified as structural variables.

Attitudinal dimension involves the attitudes and values held by parents or teachers with regard to themselves and the child. These attitudinal variables are assumed to be more directly related to school learning than the structural variables are. Process variables are usually defined as those behaviors or provisions made by the parents and teachers, "to which the child attends or reacts and which influence the child's educational performance" (Keeves, 1972, p. 37). The focus here is on what the parents or teachers actually do to facilitate academic achievement of the child. Since the parents and teachers are respectively expected to determine much of what happens in the home and much of what happens in the class in their control, their behaviors or involvement in the student educational activities are expected to have a direct and significant impact on the student performance.

There has been a fair amount of agreement among social scientists that educational achievement can be successfully

predicted by the socioeconomic status (SES) of the families among social scientists (Coleman et al., 1966; Coleman, Hoffer, & Kilgore, 1982; Jencks, 1972; Majoribanks, 1979; Sewell, Hauser, & Featherman, 1976). White's (1982) meta-analysis indicates that SES is significantly correlated with academic achievement. The family status variables studied typically include parental education, occupation, and family income. The socioeconomic status variables, however, do not provide specific clues as to what parents and teachers might do to improve the educational conditions for children (Bloom, 1976). Moreover, they do not automatically yield certain level of academic achievement. The structural variables including SES are rather assumed to influence the student attitudes, efforts, and eventually academic achievement through the environmental mediators such as parental attitudes and involvement in the child's educational activities. In this respect, importance of socio-psychological process of learning environments has been continuously suggested (Clark, 1983; Majoribanks, 1979; Thompson, 1985).

Studies on the influence of structural variables of school have provided somewhat mixed results. In particular, large scale investigations of the relative effects of school on student achievement have reported insignificant or weak relations between the structural conditions of school and

student achievement (Averch et al., 1972; Brookover et al., 1978; Coleman et al., 1966; Jencks, 1972). It is difficult to conclude with any confidence that the structural variables of school are directly related with student achievement (Rutter et al., 1979). Several researchers (Fordham, 1982; Rutter et al., 1979; Sorenson & Hallinan, 1977), pointing out that most of the investigations associating schools to student academic achievement failed to adopt adequate environmental measures, suggest that the future studies should include the variables which directly affect student performance. Dyer (1972) further proposes that the studies of environmental effects on academic achievement should be directed at identifying such "variables that begin in the school and home environment, have an impact on pupil attitudes, and then terminate in the pupil's performance in school" (p. 306).

In effect, many studies of school effects on student achievement have largely ignored the immediate influence of teachers with whom students interact in spite of general beliefs that the effects of schooling on the individual students to a considerable extent depend on who his or her teacher is and what the teacher actually does in the class. Carroll (1963), in his model of school learning has hypothesized that instruction quality is one of five elements determining school learning. Bloom (1976) further assumes

that all children can learn what any children learn if they are provided with the appropriate teaching - learning environment. Quality instruction or generating adequate learning environment is, on the whole, determined by what the teacher does in his or her class for the students. The empirical findings that some teachers are more effective than others in teaching students make plausible the contentions that the nature of teacher can makes a difference in the level of student achievement.

Theories of expectation effects (Brophy & Good, 1974; Cooper, 1979; Darley & Fazio, 1980) illustrate that teacher expectations might be a great source of differential teacher behaviors which may lead to differential level of student achievement. The underlying assumption of the theories is that a teacher develops certain expectations for each student or a group of students and his or her behavior in class is directed toward the student(s) in such a way that confirms these expectations. There is a considerable empirical evidence supporting the assumptions that teacher expectations for student performance have significant impact on the differential teacher treatments which may result in variations in student achievement (Brophy, 1983) and that teaching behaviors influence student achievement (Brophy & Good, 1974).

It is also assumed that status variables of the

student family contribute to formation of differential teacher expectations for the student achievement. Teachers may develop generalized expectations through vicarious and direct experience with children from varying family status (Baron, Tom, & Cooper, 1985). Generally teachers tend to have higher expectations for middle class students than for lower class students (Bennett, 1980; Cooper, Baron, & Lowe, 1975; Rist, 1970; Wong, 1980). Family status is also assumed to be a contributor to differential teacher treatments of students from various family backgrounds. It has been found that middle class students receive more and higher quality instruction (Friedman, 1976; Weinstein & Middlestadt, 1979). Thus differential teacher expectations and treatments were found to influence student expectation for his or her school performance (Brattesani, Weinstein, & Marshall, 1984; Nicholls, 1978; Stipek, 1982).

The nature of teacher expectation effects can be generalized with parent expectations for their child. For instance, parents with high SES are more likely to have high expectations and aspirations for the child's education and occupation (Ferrone, 1984; Rehberg & Westby, 1967) and to encourage the child (Rehberg & Westby, 1967; Sewell & Shah, 1968). Parent expectations are significantly associated with the child's expectations (Echols, 1982; McKee, 1976) and achievement (McKee, 1976). Students from the high SES

families also tend to have high expectations and aspirations (Ferrone, 1984; Harrison, 1969) and to be more involved in school activities (Rehberg, Sinclair, & Schafer, 1970) which may lead to an increase in achievement. It becomes increasingly clear that parent expectations are communicated to the child's achievement through parent involvement and the child's own expectations.

The forgoing statements implicitly suggest a need for an explanatory causal models of educational environments including not only structural, attitudinal, and process variables of the home and school but also student variables which influence academic achievement in such a way that some effects are direct and other effects are mediated by remaining variables in the model (Fordham, 1982). The set of relationships between the environmental dimensions of the home and school and their influences on a student can be simplistically represented in Figure 1.

The diagram illustrates a general networks of a total environmental process presumably influencing school learning. There have been many isolated studies of the various steps involved in this total process. However, they tended to focus on only a few segments of the process at a time. In this study, causal relationships were explored among some selected variables from each of all both environmental and individual dimensions, particularly focusing on theories of

	Structural	Attitudinal	Process	Student learning
Home:	Socio-demographic & physical background	Parent attitudes	Parent involvement	Attitudes Behaviors
School:	Characteristics of student body, staffs, and physical conditions	Teacher attitudes	Teaching behaviors	Outcomes

Figure 1. A general conceptual model of the effects of the home and school environment on school learning

expectation effects. The model served as a guide to formulating specific path analytical models of expectation effects in this study. Although experimental studies in this area are not possible because of practical and ethical considerations, simply to know whether or not a causal relationship is likely to exist is in itself of great value both practically and theoretically (Thompson, 1985).

Definition of terms

Expectation Expectation simply means an anticipated or predicted level of success or performance. Expectations are here defined as the level of school performance that a person expects to reach as a result of school learning. The

present study included three different sources of expectations from student, parent, and teacher.

a) Student expectations refer to the level of achievement that each student expects to achieve in each of subject areas.

b) Parent expectations refer to the level of achievement that the parents believe to be their child's ability to attain in schooling.

c) Teacher expectations indicate the level of accomplishment that the teacher judges an individual student ability to reach in each of subject areas.

Parent aspiration The level of aspirations is usually defined as "the goal or quality of performance desired by an individual (or group) in a specific activity" (Good, 1973, p. 43). Parent aspiration refers to the level of school education and occupation that the parents want their child to complete or choose in the future.

Academic achievement Student outcomes obtained from schooling are more specifically defined as student knowledge or intellectual skills expressed in his or her performance on achievement tests. The level of achievement in this study was represented by the grade equivalent scores obtained for the composite scores in mathematics and English respectively, of the Iowa Test of Basic Skills (ITBS).

Learning ability The ability of an individual student to acquire knowledge or skills proficiently is the level of learning ability represented by a composite standard score on the Cognitive Abilities Test (CAT).

Locus of control Locus of control is generally defined as the degree to which an individual believes in control of reinforcement which is contingent upon his or her behaviors (Rotter, 1966). Locus of control was, in this study, employed to indicate the degree to which each student perceives his or her control over achievement (internal). Empirical evidence from a variety of sources (see, reviews by Bar-Tal & Bar-Zahar, 1977; Findley & Cooper, 1983; Lefcount, 1976) makes it clear that student belief in locus of control and their academic achievement are more likely to be interrelated indirectly rather than directly: A student with a belief in internal control is expected to be more involved in achievement-oriented behaviors, and then to achieve high level of academic performance. When a student believes that increased effort will bring about academic success, he or she usually persists longer at the task and thereby increases the level of his/her achievement (Weiner, 1979; Weiner et al., 1971).

Student efforts This global concept was used to describe the amount of the "mental or physical energy exerted to achieve an end or to overcome any kind of obstacle" (Good,

1973, p. 207). Following areas of student efforts were included:

a) Student engagement is the extent to which a student show behaviors relevant to learning during class time. The behaviors include paying attention to the teacher, staying to the assigned tasks, getting involved in the work, reading and writing when supposed to, working without distractions, etc.

b) Out-of-school efforts represent the amount of time spent on academic related activities out of school (homework, spare time reading, and TV viewing). Homework is especially assumed to have a compensatory function for school learning.

c) School attendance refers to attendance rate.

Teacher clarity This concept is usually used to describe "a state in which a teacher who is in command of the subject matter to be transmitted is able to do that which is required to communicate with learners successfully" (Hines, Cruickshank, & Kennedy, 1985, p. 87). It is assumed that such teachers provide students with clear explanations and directions, appropriate monitoring, feedback and pacing, use of examples, well-organized and structured presentation, etc.

Academic values Some people place importance on academic performance while other consider it less seriously. Academic values in this study indicate the degree to which a student, parent, or teacher respectively thinks of student performance (learning new materials in each of subject areas

and getting good grades) as important.

Hypotheses

Based on theoretical considerations and previous research studies, as discussed in the section of literature review, several hypotheses were formulated to be tested. These hypotheses dealt with 1) the relationships between selected structural, attitudinal, and process variables of the home, student attitudes, efforts, and academic achievement, 2) the relationships between selected attitudinal, process variables of the school, student attitudes, efforts, and academic achievement and structural variables of the home, 3) the role of parent involvement, student expectations, and student efforts as mediators in the parent expectation effects, 4) the role of teaching behaviors (clarity), student expectations, and student efforts as mediators in the teacher expectation effects, and 5) the role of student efforts as mediators in the student expectation effects.

Hypotheses for relationships between structural variables of the home and parent attitudes, involvement, student attitudes, efforts, and achievement Previous studies have consistently reported significant relationships between family status and other dependent variables: For example, the status of the family has been reported to be related to parental aspirations and encouragement (Sewell

& Shah, 1968), student participation in school activities, aspirations, expectations, and grades (Ferrone, 1984). Other studies have demonstrated parent attitudes (i.e., expectations) and involvement play a major role in the performance of the students (Bell, 1963; Ferrone, 1984).

Socioeconomic status (SES) of the family, type of family, and student learning ability will be positively related to:

1) Parent attitudes toward the child's schooling (expectations for the child's achievement, values of schoolwork, aspirations for the child's future education and occupation).

2) Parent involvement in the child's educational activities (parental support, discussion, supervision, and visiting the school).

3) Student attitudes toward schoolworks (expectations for achievement, values of schoolwork, and locus of control).

4) Student efforts (engagement, attendance, time spending on homework, spare-time reading, and TV viewing (negatively scored)).

5) Academic achievement (English and mathematics).

Parent attitudes toward the child's schooling (expectations for the child's achievement, values of schoolworks, aspirations for the child's education and occupation) will be positively related to:

1) Parent involvement in the child's educational activities

2) Student attitudes toward schoolworks

3) Student efforts

4) Achievement

Parent involvement in the child's educational activities will be positively related to:

- 1) Student attitudes toward schoolworks
- 2) Student efforts
- 3) Achievement

Student attitudes toward schoolworks will be positively related to:

- 1) Student efforts
- 2) Achievement

Student efforts will be positively related to achievement.

Hypotheses for relationships between teacher attitudes, behaviors, student attitudes, efforts, achievement and status of the home and student learning ability As discussed in the section of theoretical framework and literature review, structural variables of the home are assumed to influence the formation of differential teacher expectations for student achievement, thus the expectations may lead to differential teacher treatments, and eventually to different levels of academic achievement.

Status variables of the home (socioeconomic status and type of the family) and student ability will be positively related to:

- 1) Teacher expectations for student achievement
- 2) Teaching behaviors (clarity)

Level of teacher expectations will be positively related to:

- 1) Teaching behaviors (clarity)
- 2) Student attitudes toward schoolworks
- 3) Student efforts
- 4) Achievement

Teacher clarity will be positively related to:

- 1) Student attitudes toward schoolworks
- 2) Student efforts
- 3) Achievement

Hypothetical path models

As discussed in the section of theoretical framework and literature review, it has been suggested that socioeconomic status of the family might have significant impacts on student achievement by influencing attitudinal and process variables of the home; that is, parental attitudes toward and involvement in the child's educational activities. It has also been suggested that the SES and type of family might influence teacher expectations and behaviors which are more directly related to student achievement. In this study, it was expected that high SES would bring about high level of parent and teacher expectations for student achievement.

Then these expectations would lead to high level of achievement by increasing not only parent involvement in the child's educational activities but also by improving the instruction quality; that is, teacher clarity.

Based on theoretical considerations and previous studies, path analytical models were developed to test the following hypotheses.

Hypothesis Socioeconomic status is expected to lead to an increase in achievement, both directly and indirectly by increasing the levels of variables including parent expectations, parent involvement in the child's educational activities, student expectations, and efforts on schoolworks. (Figure 2).

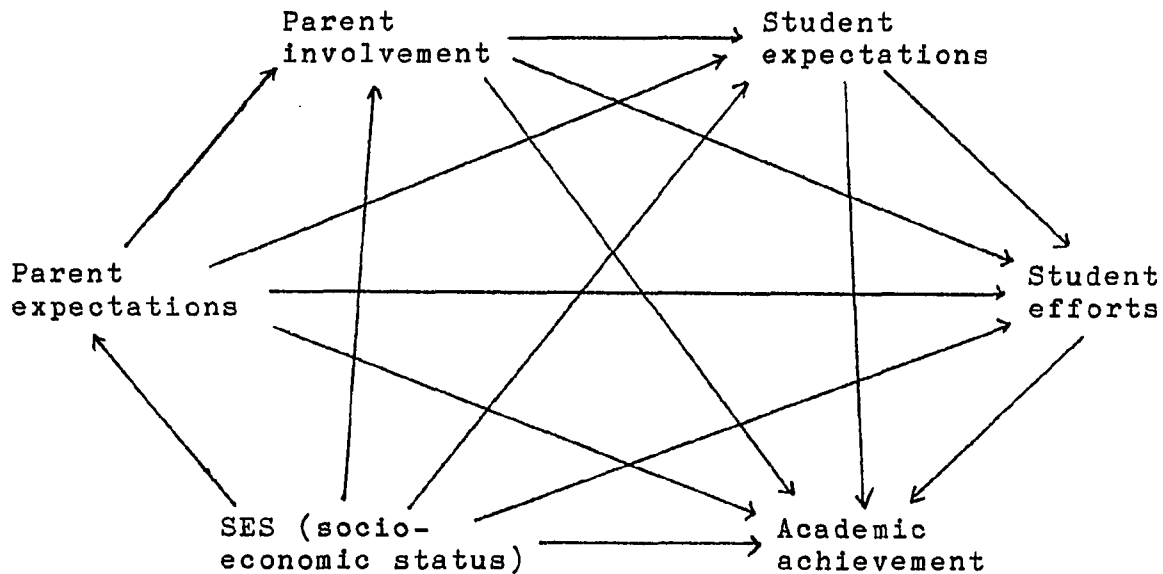


Figure 2. Hypothetical model of the effects of SES of family on academic achievement mediating by parent expectations, involvement, student expectations, and efforts

Hypothesis Socioeconomic status is expected to lead to an increase in achievement, both directly and indirectly increasing the levels of teacher expectations, teacher clarity, student expectations, and efforts on schoolworks (Figure 3).

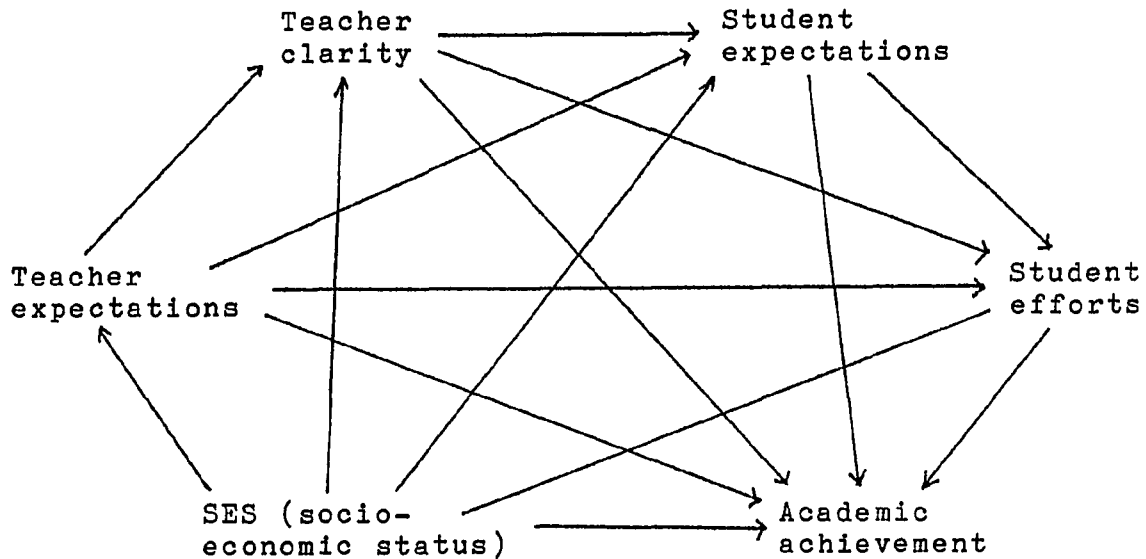


Figure 3. Hypothetical model of the effects of SES of family on academic achievement mediating by teacher expectations, teacher clarity, student expectations, and efforts

As shown in Figure 2 and Figure 3, these models were essentially identical in that they included same steps and elements of expectation communication process (also see Figure 4). The only difference was that the model of parent expectation effects contained parent expectations and involvement in the place of teacher expectations and clarity

for the model of teacher expectation. In fact, the concept of expectation effects which has been focused on the teacher in most of education research was employed to the formulation of the model for the parent expectation effects in this study. This study was interested in parent and teacher expectations influencing student achievement respectively, rather than combined effects of their expectations on achievement. Thus separate models for parent expectations and teacher expectations, thereby separate analyses were considered.

In addition, since sex difference in performance expectations has been widely reported (e.g., Kimball & Gray, 1982), the two genders were considered separately. Gender and grade levels of students were controlled by producing separate analyses for boys and girls and for sixth and eighth grade students.

REVIEW OF LITERATURE

Expectation models

Many social scientists have employed Merton's concept of self-fulfilling prophecy to explain a wide range of social phenomena. According to Merton (1948), "a self-fulfilling prophecy is, in the beginning, a false definition of the situation evoking a new behavior which makes the originally false conceptions come true" (p. 195). The definition clearly suggests that a self-fulfilling prophecy emerges when a person, in an interpersonal setting with other person(s), acts consistently with or in accordance with his/her expectations for the target.

It was, however, not until publication of Rosenthal and Jacobson's (1968) "Pygmalion in the Classroom" that the topic of teacher expectation became a focus of considerable research interest in the field of education. In their experimental study, all the children in one school which consisted of 18 classrooms, three at each of the six grade levels, were administered a nonverbal test of intelligence. The test was disguised as a test to predict "academic booming". Within each grade level the three classrooms were composed of children with above average ability, average ability, and below average ability, respectively. Within

each of the 18 classrooms approximately 20% of the children were randomly chosen to form the experimental group. Then each teacher was given the names of the children from his or her class who were in the experimental condition and was told that these children would show large gains in intellectual competence during the school year. At the end of the school year, all the children were retested with the same intelligence test. Across all classrooms, the children whom the teachers had been led to expect large gains in intellectual ability showed significantly greater gains in the test score than did the children of the control group. The children in the experimental group also showed significantly greater gain than the children in the control group for reading, one of the eleven grades considered. On the basis of their findings, Rosenthal and Jacobson (1968) concluded that children in the experimental group benefited more than the children in the control group during the school year, and that the induction of a teacher expectation for student performance caused such a benefit.

The publication of "Pygmalion" stirred considerable public interest because of its practical implication: The findings were even interpreted as suggesting that school learning could be improved simply by making the teacher think better of their the children's ability (e.g., Yunker, 1970). At the same time a series of criticism (Barber & Silver,

1968; Elashoff & Snow, 1971; Jensen, 1969; Thorndike, 1968, 1969) were raised concerning the methodologies and analytical procedures employed. Further the study has stimulated a number of subsequent studies to investigate various aspects of teacher expectation effects. However, the early studies on teacher expectations were, as Dusek (1985) states, conducted in "a theoretical vacuum" (p. 133). They tended to focus on merely identifying expectation effects without theoretical propositions.

Since early in 1970s, there has been a considerable effort to organize information related to teacher expectancy into certain theoretical frames. In particular, many conceptual models (Brophy & Good, 1974; Cooper, 1979; Cooper & Good, 1983; Darley & Fazio, 1980; Garner & Bing, 1973; Rosenthal, 1974, 1985) explained the process through which the expectations are mediated to student performance. These models have contributed enormously to research effort to explain the nature of expectation effects.

Rosenthal (1974) proposed a four-factor theory of the communication of expectancy effects. The four factors include: (1) climate - creating a warm socio-emotional climate for high expectation students; (2) feedback - giving them more feedback as to what they have been performing; (3) input - teaching them more material and more difficult material, and (4) output - giving them more opportunities to

respond. These factors are considered to be the potential mediators of positive teacher expectation effects. The model strongly suggests that in many ways teachers treat high expectation student differently than they do to other students.

Garner and Bing (1973) postulated that teacher expectations lead to differential teacher behaviors and that these teacher behaviors bring about differential student behaviors, which may yield different levels of attainment. Brophy and Good (1974) also proposed a sequential model similar to Garner and Bing's including four steps: (1) the teacher develops an expectation predicting specific behavior and achievement for each student; (2) because of these expectations, the teacher behaves differently toward each student; (3) this treatment informs each student about the behavior and achievement expected from him/her and affects the student's self-concept, achievement motivation, and the level of aspiration; and finally, (4) if teacher treatment is consistent over time and the student is behaviorally compliant, the student achievement will come to correspond, or remain correspondent with the teacher's belief. Rosenthal (1985) also proposed a path analytical model, called as "Ten arrow model" for the study of interpersonal expectancy effects. This model includes five basic elements: distal independent variables, proximal independent variables,

mediating variables, proximal dependent variables, and distal dependent variables. Distal independent variables refer to such stable variables as gender, social status, ethnicity, ability, and personality of teacher as well as of the students. The proximal independent variables refer to the teacher expectations. Mediating variables represent the processes by which the expectation is communicated to the student. The focus is here on the behavior of the teacher during interaction with the student. Proximal and distal dependent variables respectively refer to the behavior of the student after interaction with the teacher and the long term outcomes (pp. 54-55).

The models reviewed above provide more sophisticated conceptual frameworks guiding studies of expectation effects than the earlier ones assuming direct relationships between expectations and outcomes. These models have also stimulated empirical studies identifying factors mediating teacher expectations to student performance. Integrating the components of these models and particularly expanding models developed by Brophy and Good (1974) and Rosenthal (1985) generated a general model guiding the present study. The model contains following six elements: (A) backgrounds of both teacher and student (gender, ability, social status, physical surroundings, etc.), (B) teacher expectations, (C) teacher behaviors, (D) student expectations, (E) student

efforts, and (F) achievement. The interrelationships between the elements were represented in the following diagram.

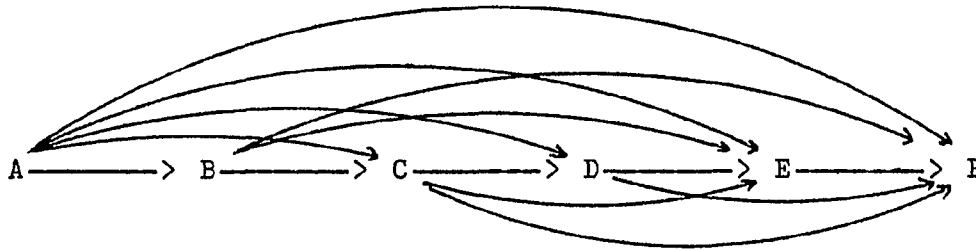


Figure 4. Model for the study of teacher expectation effects

Of course, research studies have accumulated investigating links in this hypothesized sequential model. They, however, tended to focus on some elements of the process. No one single study has dealt with all steps at a time in spite of importance of educational implications of their interlocking relationships. In the following sections, literature related to elements B through E are discussed.

Teacher expectations

Since publication of Rosenthal and Jacobson (1968) report, a number of subsequent studies were conducted to replicate the "Pygmalion" effect. However, expectancy studies using the original research design have yielded inconsistent results. In Caliborn's (1969) study, twelve first-grade classes, four from each three schools participated in the

study. Within the school, classes were randomly assigned to the control and experimental conditions. In the beginning of the spring term, all the children in 12 classes were administered a general ability test. Classroom teachers were then told that the test was designed to predict "intellectual booming". The teachers were given the names of students, 20% who had been randomly selected from each class and designated as "boomers". About two and half months later, all classes were retested with the same intelligence test. It was found that there was no significant effect as measured by the gain scores in intelligence test for the children designated as boomers when compared to the children in the control group.

Jose and Cody (1971) performed a replication study in first and second grade classrooms and found that there were no significant expectancy effects. Gain scores in arithmetic and reading tests for the control and experimental groups were not significantly different. A study conducted by Conn et al. (1968) in first through sixth grade classrooms also revealed no significant differences in gain scores for the reasoning and verbal test between the control and experimental groups. In a study by Mendels and Flanders (1973), no significant differences were found between two comparative groups on reading and arithmetic grades, social skills, and reading level although the experimental group made greater gain scores on the intelligence test. The study

was conducted in ten first grade classes for educationally deprived students.

Evans and Rosenthal (1969), who employed kindergarten through fifth grade children and their teachers, revealed significant treatment effect only for boys whereas the reverse occurred for girls. The results of the studies by Meinchenbaum, Bowers, and Ross (1969) and Rosenthal, Baratz, and Hall (1974) were supportive of the original findings. In Rosenthal and his colleagues' (1974) study performed in an elementary school predominantly composed of low-income black children, all children were pretested with both an intelligence test that had been used in earlier studies and a drawing test which asked children to draw a picture of a person on one side and to draw as many different things as possible on the other side of a paper. The intelligence test was disguised as test of children's creative potential and drawing test score was used as measures of creativity. Teachers were given the names of 20% of the children randomly selected from their classes and told that these children would show greater gains in creativity during the school year. At the end of the school year, the intelligence test and drawing test were readministered and gain scores in the test performance of experimental group were compared with those of the control group. For the school as a whole, there was no evidence supporting expectancy effects as measured by

gain scores in intelligence and creativity measure. Among the fifth grade children, however, those children whose teachers had been told that they would show unusual gains in creativity did actually show greater gains on both intelligence and drawing tests indicating the existence of expectation effects.

The majority of studies on expectation effects has failed to reveal the findings of Rosenthal and Jacobson. Rosenthal and Rubin (1971) found that only 34% of 199 studies reviewed was supportive of expectancy effects. Of the 37 studies on teacher expectations, 38% of them showed significant effects. In the later review, Rosenthal and Rubin (1978) examined first 345 experimental studies on interpersonal expectation effects conducted in the variety of situations and subjects. The results showed that about two-thirds of the subjects employed in those studies were affected by treatment. They draw conclusions that "the effects of interpersonal expectations were as great, on the average, in every day life situations as they were in the laboratory experiments" (p. 385).

Crano and Mellon (1978) argued that the failures of replication studies might not necessarily indicate that expectation effects did not occur, but that the experimental treatments employed might be insufficient to counteract naturally generated expectations. In fact, most of

experimental studies on teacher expectation effects have failed to evidence that the false information provided to the teacher did actually operate in the formation of their expectations as anticipated by experimenter. In an attempt to identify the effects of the naturally occurring expectations, Crano and Mellon analyzed data including teacher expectancies and academic achievement scores in four academic years from 72 schools that included primary grades. They found nineteen correlations favored expectations effects.

Researchers have identified two different kinds of teacher expectation effects on student performance depending on how the expectations are generated. The first type of effect, which is named "teacher bias" (Dusek, 1975) or "self-fulfilling prophecy" (Cooper, 1985), refers to the effect of expectations based on false information supplied to teachers. These studies rarely identified whether the false information actually contributed to the formation of teacher expectation. The second type of teacher expectation effects, called "teacher expectancy" (Dusek, 1975) or "sustaining effects" (Cooper & Good, 1983) refers to the effect of teacher self-generated expectations through observing and interacting with students in the natural classroom settings. Dusek (1975), in the review of previous studies, concluded that there was little evidence supporting bias effects in ordinary

classrooms, but much evidence supporting expectancy effects. Cooper (1979) also argued that sustaining expectation effects may be more frequent than self-fulfilling prophecies, since teacher expectations for students are very accurate in real classrooms. Although the potential for teacher expectations to function as self-fulfilling prophecies always exists, the extent to which they actually do so in ordinary classrooms is probably very limited (Brophy, 1983).

Teaching behaviors

If teacher expectation is a determinant of individual difference in student achievement, one of questions addressed is whether teachers indeed treat students for whom they have differential expectations in a different way. Based on the assumption that teacher expectation effects, if any, are mediated through teacher behaviors, a number of investigators have examined whether teacher expectations lead to differential behaviors.

Some studies (e.g., Alpert, 1974; Weinstein, 1976) failed to find significant differences in teacher behaviors varying with expectation levels. There is yet considerable empirical evidence suggesting that teachers interact with high- and low-expectation students differently. Brophy and Good (1970), in a naturalistic study of four first-grade classrooms, found large and consistent differences in teacher

behavior toward high- and low-expectation students in their classrooms. Their behavioral data indicated that teachers favored the high expectation students over low expectation students in demanding and reinforcing quality performance, and they were more persistent in eliciting responses from the high expectation students than they were with the low expectation students. Taylor (1979), in a study conducted in a laboratory teaching situation with "phantom" students, found that teacher with low expectation students taught less material, allowed less response opportunity, gave frequent praise after successful performance, and showed less vocal nervousness.

Many attempts have been made to integrate the research findings on the mediation of teacher expectation effects. Rosenthal (1974), in his review of research conducted to the date, identified four factors (climate, feedback, input, and output) of teacher expectation effects as described in the previous section. Brophy (1983), reviewing literature on teacher expectations, identified more extensive and specific teacher behaviors as mechanisms through which teachers might impede or limit student performance. They were listed as follows (pp. 641-642).

- 1) Wait less time for low expectation students to answer.
- 2) Give low expectation students the answer or call on someone rather than trying to improve their response through repeating the question, providing clues, or asking a new question.

- 3) In appropriate reinforcement: rewarding inappropriate or incorrect answers by low students.
- 4) Criticizing low students more often for failure.
- 5) Praising low students less frequently than high students for success.
- 6) Failure to give feedback to the public responses of low students.
- 7) Generally paying less attention to low students interacting with them less frequently.
- 8) Calling on low students less often to respond questions.
- 9) Seating low students farther away from the teacher.
- 10) demanding less from low students.
- 11) General differences in type and initiation of individualized interactions with students.
- 12) Differential administration or grading of tests or assignments, in which high expectation, but not low expectation students are given the benefit of the doubt in borderline cases.
- 13) Less friendly interaction with low students, including less smiling and other nonverbal indicators of support.
- 14) Brief or lesser informative feedback to the questions of low students.
- 15) Not only less smiling and nonverbal warmth, but less eye contact and nonverbal communication of attention and responsiveness in interaction with low students.
- 16) Less intrusive instruction of low students/more opportunity for them to practice independently.
- 17) Less use of effective but time consuming instructional methods with low students when time is limited.

The findings of the past research make it clear that teachers sometimes treat high- and low-expectation students differently during classroom interactions. In a sense, low expectation students receive lower quality of instruction which is likely to lead to ineffective learning behaviors, thereby leading to low achievement. To the extent that these differential behaviors occur in a given teacher, that teacher expectations for student achievement are likely to

be confirmed. In fact, much research on teacher effectiveness has documented the fact that differential teaching behaviors have strong influence on student performance.

Obviously, student learning depends on the way how he or she is taught. In other words, teacher behaviors, to a large extent, determine the quality and quantity of what a student learns (Stallings, 1985). With regard to this belief, thousands of empirical studies relating specific teacher behavior to the student performance have been accumulating mostly outside of teacher expectation literature. Much of research has focused on teacher behavior and student learning of basic skills in elementary grades and in the junior high school.

As Carroll (1963) notes,

"One job of the teacher is to organize and present the task to be learned in such a way that the learner can learn it as rapidly and as efficiently as he is able. This means, first, that the learner must be told, in words that he can understand what he is to learn and how he is to learn it" (p. 725).

Among other teacher behaviors, teacher clarity has been identified as one of the most promising teacher-effects variable (Rosenshine & Furst, 1971). In a study of fourth-grade mathematics teachers, Good and Grouws (1977) found that one of the necessary skills for effective class instruction was ability to make clear presentation. Effective teachers

in terms of greater student performance on standardized achievement test exceeded ineffective teachers in clarity scores, and they also demanded more work and achievement from students. Evans and Guymoun's (1978) study of the effects of teaching clarity on student learning also found clarity to be significantly correlated with student achievement. A study by Hines et al. (1985) employing preservice teachers, reported significant, positive correlations between achievement and two measures of clarity: One was students' perceptions of clarity (.53) and the other was clarity assessed by observational technique (.63). In addition, all of seven empirical studies reviewed by Walberg (1982) show significant relationships between teacher clarity and student achievement.

Teacher clarity is most commonly defined "as being clear and easy to understand" (Bush, Kennedy, & Cruickshank, 1977, p. 53) and it is generally assumed to be assessed objectively. There have been two different approaches providing operational definitions of this abstract and high-inference variable. Clarity has been somewhat narrowly defined as a vagueness term. Vagueness terms are words or phrases indicating approximation, unclarity, or lack of assurance by the teacher (Land & Smith, 1979).

Another attempt has been made defining the clarity by determining its low-inference constitutes. Measures of

clarity in this approach contain a set of specific behaviors covering relatively broad range. Cruickshank and Myers (1975) obtained a set of 110 teacher behaviors appearing to constitute "clarity" by asking 1009 junior high school students to list behaviors performed by their clearest teacher. Bush et al. (1977), using this list of teacher behaviors, asked a number of ninth grade students to rate the frequency with which their clear and unclear teachers performed with respect to each of behaviors. In addition to specific teacher behaviors which appeared to discriminate between clear and unclear teachers, the investigators identified two clarity factors: "explaining concepts and directions in an understandable manner and at an appropriate pace" and "use of examples and illustrations in presenting materials" (p. 57). They contended that clarity can be defined in terms of observational behaviors and that the clarity perceived by student is a meaningful, operational construct.

Kennedy et al. (1978) attempted to validate these findings with secondary school students from varying grade levels and geographical locations. In the study, each student was requested to target his or her most clear and unclear teachers respectively, and then respond to a set of teaching behaviors on a rating scale indicating frequency with which the target teachers performed the behaviors. The

majority of teacher behaviors employed in the study was shown to discriminate well between clear and unclear teachers. One main factor containing more discriminating behaviors was entitled "assessing student learning and providing student opportunity". Two additional factors, "uses examples" and "reviews and organizes" were identified as dimensions of clarity. This study also supports the findings that teacher clarity can be defined and measured meaningfully in terms of relatively low-inference teacher behaviors.

Logically, it appears that students learn more when teachers explain exactly what students are expected to learn, demonstrate the steps needed to accomplish a particular academic task, and provide appropriate feedbacks. This could be much more true in elementary and secondary school classrooms where the structured instructions are favored (Rosenshine, 1971). Teacher clarity also seems to have indirect effects on academic achievement. It is assumed that clarity can influence certain motivational variables that may be associated with student performance. For example, Hines et al. (1985) reported positive correlation between student satisfaction with the lesson and two clarity measures: .69 for student perception of clarity and .46 for objective measure.

Student expectations

Investigation on expectation effects have typically focused on the classroom teachers, whereas student expectation for his/her own performance has not received much research attention. Only a limited number of research efforts has been directed toward the student. As Smead and Chase (1981) states, student expectation has been a neglected variable in both theory building and research on the effects of teacher expectation.

Student expectations are usually defined in terms of how the student perceives his or her own performance or achievement. Students develop expectations for their school performance based on a variety of past experience and abilities, and these expectations may lead them to the direction in which the expectations are fulfilled. As Feather (1966) contends that high expectations of success lead to greater persistence in the face of difficulty, students who have high expectations for academic achievement will exert greater effort and persist longer than those who have low expectations for achievement. As a result, student expectation can influence achievement level (Schunk, 1984, 1985).

Several studies conducted with junior high school students have supported the strong relationships between student expectations and achievement. A study by Zanna et al. (1975) showed that students improved to a greater extent

when they held positive expectations. In the study, half of 6-8th grade students participating in a summer enrichment program in mathematics and English were told that they would probably perform well in the program while half of them were given no such information. Comparisons were made between two groups of on verbal skill and mathematics, which were measured by a standardized test before and at the end of the program. Smead and Chase (1981), having found significant relations between student expectations and achievement, argued that the student expectations should be included in theory building.

Other empirical studies (Humphreys & Stubbs, 1977; Kimball & Gray, 1982; Kovenklioglu & Greenhaus, 1978; Morrison, Thomas, & Weaver, 1973; Vollmer, 1984) conducted with samples beyond junior high school students have also supported the positive relations between student expectations and achievement. For example, Kovenklioglu and Greenhaus (1978), in a study of college students in freshman chemistry classes, found that expectations were still significantly related to performance after previous performance and ability attribution were statistically controlled. In addition, Vollmer (1984) hypothesized that expectancy directly determines student efforts and thereby indirectly what grades they earn. The findings of his study indicates that expectancy was found to be still related to grades for both

women and men when all other variables considered were controlled, but the hypothesis found support only in a male group.

Student efforts

The relationships between student behaviors (efforts) and academic achievement have been examined mostly outside of expectation effect literature. Researchers have assumed direct links between student behaviors and achievement. A considerable evidence has been documented suggesting significant relationships between measures of student efforts and achievement. In this section, related literature will be reviewed with two categories of student efforts: in-class behaviors (engagement) and out-of-school efforts.

Engagement Interest in academic engagement as achievement variable was stimulated by Carroll (1963). In his model of school learning, he postulated school learning as a function of the amount of time that a student actually engages in learning. Student engagement in learning has been studied under several different labels: time-on-task, academic learning time, attention, all of which are found in the literature and which are virtually identical with regard to their references. For instance, Cameron and Robinson (1980) define on-task behavior as "--- appropriate engagement in assigned tasks, including working individually with the

teacher, waiting with hand raised, organizing materials at start of lesson, use of eraser to correct answers, checking answers, and recording results" (p. 408). Time-on-task is defined as "the amount of time a student is overtly involved in learning" (Nordin, 1980, p. 171). Lahaderne (1968) defined attention as "attending to the area of focus, namely, the subject to which the teacher had called attention, --- attending to the prescribed activity, that is, the activity designated by the teacher, ---" (p. 321). Fisher et al. (1980) use the term, academic learning time, to represent "the amount of time a student spends engaged in an academic task that s/he can perform with high success" (p. 8).

All of these terms have been employed to represent the degree to which a student engages in the activities relevant to the lesson. They all agree in proposing about the amount and intensity of student engagement in appropriate learning tasks. It has been assumed that if a student is involved in an activity, he or she is getting something out of it. It is logically clear that one can learn only when devoted to learning.

During the past two decades, a number of studies have explored empirical evidence supporting positive relations between measures of student engagement and achievement. Majority of them have continually reported that academic engagement variable is a significant correlate of achievement

(Anderson, 1975; Brophy & Evertson, 1976; Cobb, 1972; Luce & Hoge, 1978; McKinney et al., 1975; Samuels & Turnure, 1974; Soli & Devine, 1976; Swift & Spivak, 1969; Tobin & Capie, 1982). In a study of four sixth-grade classrooms with 125 children, Lahaderne (1968) found significant relationships between attentiveness and achievement scores obtained from school records. Lahaderne employed an observational schedule based on two categories of classroom behavior, "attentive" and "inattentive" and reported significant correlations ranging from .51 to .99 between scores in a variety of achievement areas and observation scores. Tobin and Capie's (1982) study which was conducted with middle school students reported positive correlation (.31) between attending to instruction and achievement in a science course. Mevarech (1985) related time on task to mathematics achievement and obtained correlations of .40 for 87 second graders and .47 for 104 fourth grade children. Brophy and Evertson (1976) also have shown strong and consistent relationships between ratings of student engagement and learning gains.

In a review of studies in this area, Bloom (1976) found that correlations of attention with gains were about .40 when the student was the unit of analysis and .50 when the class was the unit. Hoge and Luce (1979) also reviewed several studies on classroom behavior - achievement relation, which employed the individual pupil as the unit of analysis, and

also found significant relations between attending and achievement in all studies. In addition, Lomax and Cooley (1979), examining a number of studies on relations between instructional time and student achievement, reported an average correlation of .36 for engaged time with achievement. It seems clear that students who attend more to the instruction or engage more in academic related activities tend to attain a higher level of achievement than those students who do not. Moreover, empirical evidence indicates that student engagement in learning is closely related to the teacher behaviors or teaching method. For example, Anderson and Scott (1978) in a study of nine through twelve grade students, found that amount of student involvement in learning varied with differential teaching methods used. And Nordin (1980) reported moderate relationships between quality of instruction and student involvement in learning. Given higher quality of instruction, children tend to spend more time on the task. Although the importance of student involvement in learning is self-evident, it is also evident that there are great variations in efforts of teachers, parents, and student themselves to increase this important factor.

Out-of-school efforts A number of researchers have also examined the relationships between the amount of time spent on academic related activities outside school and achievement. Such variables as homework, spare-time reading,

and TV watching in particular, have received much research interest since they have some practical implications: They are not only easily manipulable but also they have compensatory function for school learning. That is, less able students are expected, in part, to compensate for their lower ability through increased homework (Polachek, Kniesner, & Harwood, 1978; Keith & Page, 1985). It has been assumed that increased amount of time a student spends on studying outside of class would improve achievement. One of the strong recommendations by National Commission on Excellence in Education (1983), "Students in high schools should be assigned far more homework than is now the case" (p. 29) also relies on assumption of positive relationship between homework and performance.

Homework is not high on the list of student out-of-school activities. Ward, Mead, and Searls (1983), in a study of National Assessment of Educational Progress, found that 36% of the 13-year-olds had no homework assigned or did not do their assignments. They summarize the findings as follows:

"Reading achievement appears to be related to time on spare time reading and homework. At all ages those who read for one to two hours in their spare time typically showed higher reading levels, as did 13-year-olds completing one to two hours of homework, ----- . With respect to homework, lowest reading performance among 13-year-olds occurred for those who did not do their homework and watched the highest levels of television" (pp. 42-43).

Other analyses of data obtained from a large sample of high school students also confirms that amount of time spent on homework has a positive effect on a student achievement (Coleman, Hoffer, & Kilgore, 1981; Keith & Page, 1985; Moore, 1984; Page & Keith, 1981; Wolf, 1979) even when such variables as SES and abilities are controlled. Keith (1982) analyzed the national data, which were collected in 1980 by the National Opinion Research Center and entitled High School Beyond (HSB), and reported the significant zero-order correlations between homework time and both grades and achievement test scores. The correlation remained still significant when field of study, ability, race, and family background were statistically controlled. Direct effect of time spent on homework was, within the path model proposed, second to that of ability. Dissertations (Moore, 1984; Tarbuck, 1984), which analyzed the HSB data, also support the findings. In Wolf's (1979) analysis of International Association for the Evaluation of Educational Achievement surveys, homework was constantly among the best predictors within student characteristics. He concluded that the number of hours of homework per week is substantially related to achievement. The effects of homework have also been supported in other analyses of the effects of public and private schools (Coleman et al., 1981; Page & Keith, 1981).

Homework effects on achievement have been demonstrated

using experiments as well (Foyle, 1985; Koch, 1965). Foyle (1985) compared achievement scores of tenth grade students who had been assigned homework to those of students who were assigned either practice or preparation homework obtained significantly higher achievement scores than those who were not assigned either at all. Few studies dealt with elementary and junior high school students. Harnischfeger (1980), however, contends that the relationship between homework and achievement seems to hold for younger students, at least down to a fourth grade level.

Since television viewing takes up much of student time, it has been hypothesized that school related activities such as homework or reading might be limited by the time spent on watching television. Some studies have reported negative relations between achievement and time spent on watching television. Students who watch more television tend to do less well in school (Hornik, 1981).

Parent expectations and involvement

Although the concept of expectations effects has been focused on the teacher in most of educational research, it can also be generalized to parents. It is reasonably believed that parents themselves develop certain attitudes toward or beliefs about the child's schooling so that they exhibit behaviors consistent or congruent with their

attitudes or belief rather than inconsistent with them. Parent attitudes toward and involvement in the child's educational activities have a significant impact on school learning since parents control much of a child's out-of-school time; that is, they have potential power to influence his or her learning activities and achievement.

Practically, the empirical research has supported statistically significant relationships between parent expectations or aspirations and the child's academic achievement. For instance, McKee's (1976) study conducted with eighth and ninth grade students and their parents found significant relationship between parent expectation and the child achievement. Parent expectations or attitudes seem to influence the child's expectation or attitudes. In an investigation of eighth and ninth grade students and their parents, McKee (1976) reported low but significant correlation between parent expectation and the child's expectation for mathematics achievement. Blevins (1979), in a study of seventh grade students and Echols (1982), in a study of both seventh and fifth grade students have respectively found that student attitudes toward mathematics were related to parent attitudes toward mathematics.

It appears that parent expectations for the child's achievement influence both the child's expectations and achievement. Callard (1979) has hypothesized that developing

parent expectations for student academic success leads to an increase in the student's achievement motivation and as a result student achievement levels will increase. In his experimental study, he made an attempt to increase parent expectation through a series of training sessions.

It has been suggested that students make more progress when their parents are directly involved with their learning and instruction (Stallings, 1981). Purkey and Smith's (1983) review of previous studies on effective schools indicates that parent involvement and support is one of the significant variables of effective schooling. With few exceptions (e.g., Izzo, 1976), positive relationships between parent involvement and the child's performance have been demonstrated regardless of the measures of parent involvement employed in the studies of this area (Babara, 1973; Blevins, 1979; Caroselli, 1981; Gutmann, 1982; Kitchens, 1977; Mize, 1978; McKee, 1976; Revicki, 1982; Saxon, 1982; Wilson, 1977). In an experimental study, Gutmann (1982) found that parent involvement in the child's learning contributed to raising the mathematics achievement levels of the second and third grade children. In the study, the children spent 90 minutes per week playing mathematical games provided by parents. Revicki's (1982) findings also indicate that "parental involvement in the educational process was both directly and indirectly associated with positive changes in child

achievement" (p. 2485A). In the study, parent involvement included data on frequency of meeting attendance, classroom volunteering, and completed home visits. Findings by Mize's (1978) show that parent involvement in the child's learning activities is also associated with levels of attitudinal variables such as self-esteem, motivation to learn, and academic attitudes.

Research evidence has been documented that socioeconomic status of the families influence the level of parent expectations for the child's education (Ferrone, 1984; Mahan, 1975; Rehberg et al., 1970; Rehberg & Westby, 1967). Parents who are highly educated or have prestigious occupations have higher expectations and aspirations for the child's education and future than the parents from lower status families. The parents from the higher status families also tend to encourage the child's study (Sewell & Shah, 1968) and involve themselves in educational activities. In a study by Revicki (1982), SES was found to be positively related to parent involvement in the child's educational activities and mathematics and reading achievement were covaried with the level of parent involvement.

The socioeconomic status was also reported to affect student expectations and aspirations (Bennett & Gist, 1964; Ferrone, 1984; Harrison, 1969; Marly, 1969) and involvement in school activities (Rehberg et al., 1970). In a study of

expectations and aspirations of sixth through eighth graders, Ferrone (1984) reported a significant and positive correlation between the SES of the student and educational aspirations ($r=.24$) and expectations ($r=.34$). Educational aspirations and expectations were represented by level of school that the students "plan to go" and "like to go" respectively.

It appears that parent expectations influence the child's achievement and parent involvement and student attitudes and efforts function as mediating factors of parent expectation effects. The structural characteristics of the home including socioeconomic status and type of the family contribute to the formation of differential parent expectations and student expectations. Both parents and students from the high SES families tend to have high educational expectations.

Summary

The empirical evidence discussed in previous sections make it clear that teacher expectations are likely to influence student achievement. It is, however, important to note that teacher expectation effects do not automatically occur, but do occur when the expectations lead the teacher to behaviors, which are assumed to differentially affect student learning behaviors and their outcomes. As Brophy (1983) notes, "existence of a teacher expectation for a particular

student performance will move in the direction expected, and not in the opposite direction" (p. 633). In a word, a teacher expectancy for a student's ability or achievement is more likely to lead that the teacher acts in accordance with the expectation than it is to lead him or her to the behavior which will disconfirm the expectation. Conceptual models have been developed to elaborate how teacher expectations are communicated to student achievement. It is clear that several intermediate steps, as discussed in the previous sections, take place between teacher expectation and student achievement. Nevertheless, empirical research on these linkages is sparse. Past research tended to focus on some elements of the whole teacher expectation process. Most previous studies were involved in simple linkages between any two elements: Mostly the links between teacher expectation and student achievement or teacher behaviors were studied in the literature of teacher expectations. Therefore, rather than generating further demonstration of isolated findings about the expectation effects, research in this area might more profitably seek linkages between all the elements included in the model (Figure 2), then ultimately develop a better understanding of whole expectation communication process and student learning (Brophy, 1983; Miller & Turnbull, 1986).

Expectation effects can be generalized to parent

expectations in virtually identical fashion. Parents who hold high expectations for their child are more likely to encourage the child and to get involved in the child's educational activities. As a result, the child develops positive attitudes toward school learning and in turn, achieves higher performance.

METHODS AND PROCEDURES

Population and sample

The present study was conducted in three middle schools in central Iowa: one middle school from a small school district with an enrollment of about 900 students and the other two schools from a relatively large school district which had approximately 4,800 students in kindergarten through twelfth grade in 1986-1987 school year. These school districts contained sixth through eighth grades for the middle school. Four hundred eleven students for sixth grade and three hundred seventy-six students for eighth grade were enrolled in their three middle schools. They were predominantly (90%) Caucasian (black, 5%; others, 5%) and almost evenly distributed with regard to gender.

Three different types of participants were included in this study: students, parents, and teachers. At first, parental permit form and questionnaire were distributed to the parents of all sixth and eighth graders through students asking for parent consent for the child's participation in this study and asking for information concerning their socio-economic status and attitudes toward the child's schoolworks. Then the students who had been provided with parent permission were asked to fill out the questionnaire. One

hundred fifteen sixth graders (47 boys and 68 girls) and one hundred nine eighth graders (43 boys and 66 girls) provided the data available for analysis for this study. Eight sixth grade teachers and eleven eighth grade teachers also participated in this study by providing their expectation levels for each student. Since the subjects of this study voluntarily participated, the sample was not randomly selected.

Instrumentation

Three different questionnaires, in addition to school records on attendance, learning ability, and academic achievement, were employed to obtain the required information from students, parents, and teachers, respectively. Student questionnaire was designed to seek information concerning the type of the family, teacher classroom behaviors (teacher clarity), parent involvement in the child's educational activities, student attitudes toward the schoolworks, and efforts in schoolworks. The questionnaire was carefully read by one specialist in writing, three elementary school teachers, and one research associate to adjust its applicability to the students of interest in this study. Then it was given individually to three fifth grade students. After filling out the try-out questionnaire, they were intensively interviewed to find out any potential problems or difficulties which might occur in its administration.

Several revisions were made until final form was developed.

Parent questionnaire asked for information about socioeconomic status of the home and parent attitudes toward the child's schoolworks. Teachers were asked to provide expectation level for each student ability to achieve in mathematics and English, respectively.

Measures of the variables in the study are described below.

Socioeconomic status In order to seek information about the socioeconomic status (SES) of the home, parent questionnaire included questions on level of parents' education and occupation, family income. SES index was obtained by combining scores (from 1 to 6) designated to each of categories representing levels of father's education completed and of education required for father's current job and amount of annual income of the family. Accordingly, possible raw scores of SES index for individual subject range from 3 to 18 in indicating that lower score represents lower family status.

Type of family Students were also asked to respond to a question about family members they lived with and their responses were classified into two categories representing type of the family: When they lived with both natural mother and father, they were coded as 1, otherwise coded as 0.

Expectations Educational expectation was one of main variables of interest. Three different sources of expectations were considered in this study; student, parents, and teacher. Using a five-point rating scale, each student was asked to provide the levels of achievement he or she anticipated to earn in mathematics and English respectively.

Parents were also requested to provide the levels of achievement that they believed the child to attain in English and mathematics. English and mathematics teachers were also requested to rate the level of achievement he or she expected each student in his or her class to reach. Eight sixth grade teachers (3 English, 3 mathematics, and 2 English and mathematics teachers) and eleven eighth grade teachers (6 English and 5 mathematics teachers). A teacher rated at most 33 students.

Locus of control Five questionnaire items were included to measure internality of control. Two items were negatively stated and these items basically dealt with whether or not a student believes that good work in a subject depends on their efforts. Three categories for each item were provided: yes (3), between yes and no (2), and no (1). Each student was asked to respond to one of these categories. If one responded to "yes", he or she was assumed to be more internal. Possible scores of locus of control measure range from 3 to 15.

Teacher clarity Measure of clarity was approached by individual student perspective. That is, teacher behaviors were judged by individual student whether they were clear enough for him or her to understand. Hence, each student was to rate his or her teacher behaviors in mathematics and English class, respectively, using a three-point rating scale. The clarity scale included 15 items. Accordingly, possible scores for the clarity scale range from 15 to 45 indicating that higher scores represent clearer teaching or instruction as rated by individual student. Coefficient Alpha was used as a measure of internal consistency of the scale for sixth grade and eighth grade students in English and mathematics classes. The estimates of the reliability coefficients of the scale are presented in Table 1.

Table 1. Reliability coefficients of teacher clarity scale

Classification	Coefficient Alpha
6th grade (N=111)	
English	.87
Mathematics	.86
8th grade (N=107)	
English	.91
Mathematics	.82

Student effort Three indices of the student effort were obtained as follows:

Engagement Student attending to the classroom learning was considered to be a significant correlate of student achievement. To produce a measure of engagement, a self-rating device was employed in this study. Each student was asked to respond to eight questionnaire items presumably describing student behaviors involving in mathematics and English class. A five-point rating scale was used representing the frequencies of such behaviors. Possible scale values range from 8 to 40.

As a measure of the reliability of the engagement scale, coefficient Alpha was computed for sixth graders and eighth graders by class (English and mathematics) separately. Estimated reliability coefficients are presented in Table 2. They evidence that the clarity scale employed in this study

Table 2. Reliability coefficients of engagement scale

Classification	Coefficient Alpha
sixth grades (N=113)	
English	.79
Mathematics	.74
eighth grades (N=109)	
English	.78
Mathematics	.73

was a highly reliable measure. Engagement scores obtained from student self-ratings were used as measures of student effort variable included in the path models of the study.

Out-of-school effort Student questionnaire included three items seeking information from each student about amount of efforts he or she exerts on the activities related school learning. These items dealt with amount of time spending on homework, reading at spare-time, and watching TV. Students were asked to respond to one of six categories for each item. Possible scores for each area range from 1 to 6 and higher scores represent more efforts on academic-related out-of-school activities.

Attendance Student attendance records (days absent from English and mathematics classes) were obtained from the central office of the respective school buildings. Attendance rate was calculated combining absent records for English and mathematics class. Attendance rate was used as a measure of attendance variable for statistical analyses whereas number of days absent was used only in presenting descriptive statistics.

Academic values Student questionnaire included two items with a five-point rating scale (five categories) to measure student values on school learning. These items dealt with the importance of grades and of learning the subjects (English and mathematics). Data on parent and teacher values

were also collected based on student perceptions. Possible scores of 'values' from student, parents, and teacher range from 2 to 10 in indicating that higher scores represent higher values.

Parent involvement With an attempt to seek information about the extent to which parents involve in the child's educational activities, eight questions were devised to be included in the student questionnaire. These questionnaires covered four areas of interest: discussion, support, visiting school, and supervision. Three 'discussion' items were about parental discussion with the child about his or her school progress and other school happenings, and TV programs they watch. Two 'support' items were about parent help with homework. Two 'supervision' items dealt with whether parents know what the child does after school and one item for 'visiting school' was about how often parents visit school to see how well the child is doing. Five-point rating scales (five categories for each item) were employed. Involvement scores were obtained by combining raw scores from the areas considered as involvement variables. Accordingly, possible scores for involvement variable included in the path models range from 8 to 40.

Academic achievement The grade equivalent scores on mathematics and Language of the Iowa Test of Basic Skills (ITBS) were used as measures of academic achievement in mathematics and English respectively. The ITBS is a standardized achievement test designed to be administered in a group format. The multilevel battery of the test, which is available for use in grade 3 to 9, covers major areas of fundamental skills including mathematics, reading, language, and work-study, and it contains 11 subtests including supplementary subtests in social studies and sciences. The ITBS scores are highly reliable: The estimated internal consistency (K-R 20 reliability) of the composite scores for each grade level of the test is .98. The content of the test is generally representative of school curricula and the test scores substantively correlate with other measures of achievement. The test appears to be an excellent instrument measuring student performance in a variety of important basic skill curriculum areas (Airasian, 1985).

The ITBS was normed on both national and regional samples and provides composite scores for each area with subscores within each area. The test scores used in this study are grade equivalent scores for language and language read from the regional norm. The data were obtained from the file in the central office of the school districts. Both school districts administer the ITBS to some selective levels

of grade in the spring of each year. The test was administered to all sixth and eighth grade students in the spring of 1987.

Grade equivalent scores in Language and Mathematics of 1987 ITBS were regressed on composite scores of the Cognitive Abilities Test, which was used as a measure of students' learning ability and taken in 1986 (see, Learning ability below). Residuals for English and mathematics achievement were respectively obtained by subtracting predicted grade equivalent scores in Language (and Mathematics) by its corresponding CAT scores from individual students' actual scores in Language (and Mathematics) of 1987 ITBS program. These residuals were used as measures of achievement in English and mathematics for path analyses in the study.

Learning ability This study used composite standard scores of the Cognitive Abilities Test (CAT) as a measures of student learning ability. The CAT is a standardized test constructed to assess abstract intelligence. The multiple level edition of the test, which is available for use in grade 3 through 12, consists of three batteries (verbal, quantification, and nonverbal) and each battery contains several subtests. The test yields separate scores for the verbal, quantification, and nonverbal batteries. A composite scores for each student was obtained by combining the separate standard scores normalized with a mean of 100 and a

standard deviation of 16. The reliability estimates for the CAT are quite high: The K-R 20 reliability estimates range from .89 to .96 for across age levels (Ansorge, 1985).

The school districts in this study periodically administer the CAT to all students in certain grade levels. Majority of the sixth grade and eighth grade students took the test in spring of 1986, when they were in fifth and seventh grade respectively. For nine sixth grade and five eighth grade students whose 1986 test scores were not available for use, 1984 data were used.

All achievement tests measuring current individual student achievement level reflects influence of previous learning or aptitude. Therefore, learning ability in the form of intellectual ability is usually significant predictors of achievement outcomes in instructional settings regardless of what other variables are considered in the research. The CAT is intended to be a general measure of academic potential. Bloom (1976), in a review of literature regarding how well composite aptitude measures predict subsequent achievement in subject areas in reading, mathematics, reading, etc., reports correlation coefficients average about .70 across these subject areas. The CAT has been shown to be a successful predictor of academic achievement (Ansorge, 1985) and scores are readily available from school records.

Statistical analyses

For the first step in the analysis of data, descriptive statistics were obtained including means and standard deviation or response frequency and percentage for certain variables and questionnaire items. These statistics may be helpful in understanding the characteristics of the students and their parents in this study and interpreting the results of statistical analyses. The second step was to investigate relationships between the variables of interest. Pearson's correlation coefficients were calculated to determine the nature of the associations. Since the relationships between the variables were hypothesized to be in one direction, that is, positive relations, one-tailed tests were employed to test statistical significance of the correlations.

Finally, path analyses were employed. Path analysis is a method for testing causal model in which variables are sequentially ordered on the basis of the theoretical considerations. It is a way of analyzing correlations that yield estimates of direct and indirect effects of variables in a hypothesized causal system using regression techniques. Path analysis is based on regression analysis. Thus, it requires linear, additive models, and interval measures. Linearity means that the relationships among variables included in the model are assumed to be linear and by

additivity, it means that there are no significant interaction effects. Interval measures are measures that have interval scale properties. In addition, path analysis requires at least two more assumptions of uncorrelated residuals and unidirectional causal flow. A primary assumption in path analysis is that the residuals of endogenous variables of the model are not correlated with one another. The other assumption is that within each model, the direction of causality must be assumed to be one-way. That is, an endogenous variable cannot both affect and be affected by the same variable specified in the model. If these assumptions are valid, unbiased estimates of path coefficients representing size of effect of each variable treated as a cause on its dependent variable can be obtained using ordinary least squares solutions (Pedhauzer, 1982).

Two types of path coefficients can be obtained from the techniques: unstandardized coefficients and standardized coefficients. Standardized path coefficients are scale free. That is, they are obtained by entering all variables in a model on the same, standard scale. Thus, the use of standardized coefficients is preferred when variables are measured in different units or when the objective is to compare relative effects across variables in the model as is the case of this study. They are yet population-specific since standardization is based on data obtained from a

certain sample or population. Therefore, unstandardized coefficients are appropriate when comparisons are made across different groups (Kim & Mueller, 1976).

In this study, separate analyses for two different subject matters (English and mathematics), for two grade levels (sixth and eighth), and for male and female students were conducted. Regression analyses also provided the portions of variations in student expectation, effort, and achievement that can be explained by the variables considered as predictors.

Procedures

After obtaining a list of school districts which would participate in the ITBS spring program of 1986 from the testing center of University of Iowa, two school districts were selected each from large and small public school systems. Superintendents of these community school districts were contacted by both letter and telephone in March of 1987. The study was briefly described to them and they were requested to give permission for the study in their districts. Both school districts provided permission for students in their districts to participate in this study. Meetings were held with administrative members in the first week of April when they reviewed all the instruments to be administered and were given detailed information about how

the data were to be collected.

All the middle schools were visited in middle of April. The study was briefly explained to principal and they were asked to help in distributing and collecting parents' questionnaire with parental permission form. Each sixth and eighth grade student was given a sealed envelope by the classroom teacher to take home to his or her parent. Each envelope contained a letter to the parents describing the study and asking for their participation in a questionnaire to obtain information about the socioeconomic status of the family (parents' education, occupation and income of the family) and parent attitudes toward schooling (expectations, aspirations, etc.), and a permission form allowing the child to participate and the researcher to have access to their child's school records.

The completed questionnaires and permission forms were to be returned to the school in the envelope sealed. After a week, the teachers were asked to remind students to return the questionnaires and permission forms as soon as possible. During the last week of April, the schools were visited to pick up the returned questionnaires and permission forms, and administrative members of each school building were mailed lists of students in their schools whose parents had provided permission for them to participate in the study during the next week, the first week of May. During the second week in

May, each school building was visited to administer a questionnaire to all participating students and to ask their English and mathematics teachers to fill out a rating form. The student questionnaire contained a teacher clarity scale, an engagement scale, and items asking information about a variety of interest areas including expectations, academic values, parent and teacher values on school learning, parent involvement in educational activities, student's out-of-school learning activities, etc. The questionnaires were group administered to sixth and eighth grade students separately, with aid of one classroom teacher each session.

Due to absence and other complications, it was unable to administer questionnaires to six of the students whose parents had provided their permission them to participate. The students took about fifteen to twenty-five minutes to complete the questionnaire. Teacher rating forms asked mathematics and English teachers to rate achievement level of individual student they expected to achieve in the course. The teachers were told to return the completed form as soon as possible. Late in May, administrative staffs in each school district were mailed the lists of participating students in their districts and asked to provide scores on ITBS and CAT from student file.

RESULTS

Descriptive data

In this study, quantitative data on 115 sixth grade students and 109 eighth grade students were collected and analyzed. At the first stage of data analysis, descriptive statistics were computed representing characteristics of the students and their families who participated in this study. Table 3 presents means and standard deviations of the variables of interest in this study. As stated in previous section, except the data on student achievement, ability, attendance, SES, parent expectations and aspiration, and teacher expectations, all the other data were obtained from the student reports.

As shown in Table 3, considering the fact that the achievement tests (ITBS) were taken near to the end of the school year, levels of achievement of both sixth and eighth graders were found to be consistent with their corresponding grade levels. Levels of previous ability of both sixth and eighth grade students as measured by the Cognitive Abilities Test (CAT) appeared to be substantially higher than average score (100) of the norm group of the test.

Response distributions (frequencies and percentages) of questionnaire items are presented in Table 3a in Appendix A.

Table 3. Means and standard deviations of key variables

	6th grade(N=115)		8th grade(N=109)	
	Mean	S.D. ^a	Mean	S.D.
ITBS scores				
English	6.95	1.48	9.16	1.80
Mathematics	7.01	1.63	8.83	1.50
CAT composite scores	109.91	10.40	112.86	13.08
Days absent from class				
English	4.33	4.03	7.14	6.92
Mathematics	4.35	4.01	7.50	7.33
Engagement				
English	31.36	4.55	30.15	4.20
Mathematics	31.37	5.02	32.04	4.99
Expectations				
English	3.94	.78	4.01	.76
Mathematics	4.01	.79	4.01	.78
Values: English	9.15	.99	8.69	1.52
Mathematics	8.84	1.16	8.44	1.39
Locus of control	12.30	1.52	10.03	3.64
Socioeconomic status	10.14	3.17	11.71	1.46
Type of family				
Parent expectations				
English	4.07	.70	4.01	.78
Mathematics	4.07	.73	4.00	.79
Parent values				
English	9.09	1.16	8.75	1.39
Mathematics	9.32	1.39	8.69	1.40
Parent involvement				
Discussion	30.36	4.45	27.24	4.89
Support	10.93	2.22	10.02	2.40
Visiting school	8.12	1.82	7.39	1.94
Supervision	3.27	1.05	3.06	.82
Parent aspiration	8.66	1.48	7.64	1.57
Parent aspiration	8.09	1.99	7.71	1.99
Teacher expectations				
English				
Mathematics				
Teacher values				
English	9.29	1.20	8.70	1.55
Mathematics	9.35	1.11	8.84	1.57
Clarity: English	37.47	5.18	37.01	4.78
Mathematics	38.17	5.37	34.09	7.82

a

Standard deviation.

Correlational data

Since the relationships between the variables of interest in this study were hypothesized to be in one direction, one-tailed tests were used to test significance levels of the correlations.

Relationships of socioeconomic status (SES), type of the family, and student ability with parent attitudes, involvement, student efforts, and achievement variables Table 4 presents the correlations of SES, family type, and student ability scores with parent attitude, involvement, student attitude, effort, and achievement variables. Student ability was found to have the highest correlations with English and mathematics test scores for both the sixth and eighth grade students ranging from .75 to .87. Student ability variables was also positively related to parent expectations (.47 to .58) and student expectations (.34 to .38) for both sixth and eighth grade students. Other variables that revealed statistically significant relationships with student ability were parent aspiration in sixth and eighth grade, student engagement in sixth grade, TV watching in eighth grade, etc.

SES was most highly correlated with achievement (.28 to .34) and student expectations (.21 to .31) for both sixth and eighth grade students. It was also found to have significant and positive relationships with certain variables of parent

Table 4. Correlations of SES, type of family, and ability with parent attitudes, involvement, student attitudes, efforts, and achievement^a

	SES		Family type		Ability	
	6th	8th	6th	8th	6th	8th
<u>Parent attitudes</u>						
Expectations:						
English	17*	42***	08	23**	47***	58***
Mathematics	08	20**	-03	15	51***	52***
Values:						
English	00	10	-12	10	00	-12
Mathematics	06	22*	-10	22*	17*	-05
Aspiration	12	34***	-16	07	27**	34***
<u>Involvement</u>						
Discussion	-02	24**	12	14	08	02
Support	13	23**	14	27**	-00	-13
Visiting school	-04	14	12	28**	-04	18*
Supervision	-10	15	07	24**	12	-00
<u>Student attitudes</u>						
Expectations:						
English	21*	31**	02	25**	34***	36***
Mathematics	21*	30**	03	15	34***	38***
Values:						
English	-14	13	-11	06	03	-04
Mathematics	-03	16	05	10	04	01
Locus of control	23**	08	08	09	17*	13
<u>Student efforts</u>						
Engagement:						
English	11	24**	09	13	29**	07
Mathematics	08	08	03	27**	24**	05
Attendance	20*	22*	-07	10	-07	14
Homework	-07	15	04	13	06	18*
Reading	-08	00	-11	10	19*	-08
TV watching	01	15	11	-09	09	28**
<u>Achievement</u>						
English	30***	34***	02	26**	80***	87***
Mathematics	31***	28**	14	26**	75**	86***

^a

Decimal points have been omitted.

* p < .05.

** p < .01.

*** p < .001.

attitudes (expectations, value, and aspiration for eighth graders), involvement (discussion and support for eighth graders), student attitudes (locus of control in sixth grade), efforts (attendance in both sixth and eighth grade and engagement in English for eighth grade).

Family type revealed significant relationships with certain variables of interest only for the eighth grade students. The eighth grade students who lived with both natural mother and father were more likely to have high expectations, be involved in learning activities, and show high achievement than students who had the other compositions of parents (single, step-parents, guardian, etc.). These parents also tended to hold high expectations and were more likely to be involved in their child's educational activities. SES, family type and ability variables, on the whole, were found to have positive and significant relationships with certain variables of parent attitudes (expectation and value), involvement (support, visiting school, and supervision), student attitudes (expectation), efforts (engagement), and achievement.

Relationships of parent attitudinal variables with involvement, student attitudes, efforts, and achievement

Table 5 and Table 6 present correlations of parent expectations, values, and aspiration with parent involvement, student attitudes, efforts, and achievement for the

Table 5. Correlations of parent attitudinal variables (expectations values & aspiration) with parent involvement, student attitudes, efforts, and achievement^a --- 6th grade

	Expectations:		Values:		Aspira-
	English	Mathe-	English	Mathe-	tion
		matics		matics	
<u>Parent involvement</u>					
Discussion	03	-04	08	05	10
Support	07	03	-01	12	02
Visiting school	-04	02	04	07	04
Supervision	22**	17*	31***	30***	12
<u>Student attitudes</u>					
Expectations:					
English	48***	41***	08	17*	19*
Mathematics	42***	48***	14	20*	15
Values:					
English	15	14	45***	51***	23**
Mathematics	12	08	41***	35***	27**
Locus of control	22*	06	03	10	05
<u>Efforts</u>					
Engagement:					
English	25**	22*	23**	23**	19*
Mathematics	25**	25**	20*	20*	21*
Attendance	-04	-08	-03	-06	12
Homework	05	-04	16	03	-07
Reading	25**	18*	01	10	-06
TV watching	-00	14	20*	18*	01
<u>Achievement</u>					
English	44***	54***	05	18*	22**
Mathematics	62***	58***	17*	27**	33***

^a

Decimal points have been omitted.

* P < .05.

** p < .01.

*** p < .001.

Table 6. Correlations of parent attitudinal variables (expectations, values & aspiration) with parent involvement, student attitudes, efforts, and achievement^a --- 8th grade

	Expectations:		Values:		Aspiration
	English	Mathematics	English	Mathematics	
<u>Parent involvement</u>					
Discussion	10	04	29**	30**	07
Support	02	02	11	19*	04
Visiting school	18*	07	01	01	03
Supervision	16*	19*	19*	28*	-03
<u>Student attitudes</u>					
Expectations:					
English	41***	29**	08	13	31***
Mathematics	39***	53***	02	12	19*
Values:					
English	17*	14	28**	22*	00
Mathematics	19*	18*	22*	41***	05
Locus of control	14	14	02	04	06
<u>Efforts</u>					
Engagement:					
English	21*	15	05	12	17*
Mathematics	13	11	17*	31***	00
Attendance	12	14	-01	07	15
Homework	18*	13	19*	19*	18*
Reading	-02	-02	06	10	03
TV watching	06	-04	-10	03	03
<u>Achievement</u>					
English	61***	59***	-08	-03	36***
Mathematics	64***	51**	-02	06	29**

^a

Decimal points have been omitted.

* p < .05.

** p < .01.

*** P < .001.

sixth grade and eighth grade students respectively. Except expectations and aspiration, data of other parent attitudes and involvement variables were collected on the child's reports. Parent expectations were found to have the highest correlations with English and mathematics achievement in both sixth and eighth graders with correlations ranging from .44 to .64. Parent expectations also appeared to have statistically significant relationships with supervision, student expectations, engagement, etc. Parent aspiration showed statistically significant correlations with achievement, student values, engagement, etc., in sixth grade and achievement, student expectations, etc., in eighth grade.

Relationships of parent involvement variables with student attitudes, efforts, and achievement Four areas were considered as the involvement variables in this study and the extent to which the parents were involved in these areas was reported by the child. They were parent discussion with the child about school-related affairs, parent support for the child's schoolwork, parent visiting the school, and parent supervising the child's out-of-school activities. Correlation coefficients of the parent involvement variables with student attitudes, efforts, and achievement are presented in Table 7.

Parent discussion was found to have statistically significant relationships with student attitude and effort

Table 7. Correlations of parent involvement variables (discussion, support, visiting, & supervision) with student attitudes, efforts, and achievement^a

	Discussion		Support		Visiting school		Supervision	
	6th	8th	6th	8th	6th	8th	6th	8th
<u>Student attitudes</u>								
Expectations:								
English	08	12	16*	06	-16	06	07	35***
Mathematics	-03	-00	11	13	-09	03	06	27**
Values:								
English	17*	19*	18*	37***	28**	07	31***	33***
Mathematics	11	17*	00	19*	09	03	35***	25**
Locus of control	07	09	09	05	02	11	15	-02
<u>Efforts</u>								
Engagement:								
English	16*	18*	18*	24**	18*	00	43***	25**
Mathematics	14	21*	17*	21*	22*	03	40***	36***
Attendance	03	-09	06	-06	-09	-11	-10	-01
Homework	26**	21*	07	12	-10	12	07	28**
Reading	06	19*	08	14	01	03	17*	24**
TV watching	14	01	07	-14	08	06	19*	04
<u>Achievement</u>								
English	-03	12	-14	-05	-05	19*	-01	08
Mathematics	03	08	01	-10	-01	18*	11	16

^a

Decimal points have been omitted.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

variables, but not with achievement. That is, discussion was positively correlated with value, engagement, homework, and reading reported by the sixth and eighth grade students. Parent support also appeared to have significant relationships with certain attitude and effort variables. Statistically significant correlates of parent support were student expectation (English), value, and engagement in eighth grade. Parent visiting school revealed statistically significant correlations with values (importance of school performance) and engagement for the sixth grade students and achievement for the eighth grade students. Supervision, among other parent involvement variables, revealed the highest correlations with student attitude and effort variables. It had statistically significant relationships with values of schoolworks (.25 to .35), engagement in classroom learning (.25 to .43), and spare-time reading (.17 to .24) reported by the students for both sixth and eighth grade. Supervision also appeared to have positive relationships with student expectations and homework for eighth graders and with TV watching for sixth graders.

Relationships of student attitude variables with efforts and achievement Tables 8 and 9 respectively present correlations of student attitudinal variables with student effort and achievement variables for the sixth and eighth grade students. As might be expected, student

expectations revealed statistically significant and positive relationships with both engagement (.21 to .30) and achievement (.31 to .41) in sixth and eighth grades. Student expectation was also positively related to certain effort variables (attendance rate, homework, reading, and TV watching) in eighth grade. Parent values representing importance of school learning reported by the students showed moderately high correlations with engagement (.41 to .61) in eighth grade and relatively low correlations (.26 to .34) in

Table 8. Correlations of student attitudinal variables (expectations, values & locus of control) with efforts and achievement^a --- 6th grade

	Expectations:		Values:		Locus of control
	English	Mathe- matics	English	Mathe- matics	
<u>Student efforts</u>					
<u>Engagement:</u>					
English	30***	25**	27**	34***	12
Mathematics	22*	21*	26**	26**	08
Attendance	07	-12	-01	12	05
Homework	07	08	11	06	12
Reading	13	08	-08	11	11
TV watching	05	06	22*	24**	04
<u>Achievement</u>					
English	31***	37***	02	01	20*
Mathematics	41***	41***	13	03	16*

^a

Decimal points have been omitted.

* p < .05.

** p < .01.

*** p < .001.

Table 9. Correlations of student attitudinal variables (expectations, values, & locus of control) and efforts and achievement^a --- 8th grade

	Expectations:		Values:		Locus of control
	English	Mathe- matics	English	Mathe- matics	
<u>Student efforts</u>					
Engagement:					
English	40***	19*	41***	47***	10
Mathematics	33***	33***	61***	44***	09
Attendance	15	33***	07	02	02
Homework	20*	10	23**	31***	05
Reading	21*	13	17*	15	01
TV watching	17*	-06	05	10	08
<u>Achievement</u>					
English	39***	27**	08	06	11
Mathematics	39***	43**	06	01	13

^a

Decimal points have been omitted.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

sixth grade. Student values were also positively related to TV watching (negatively coded number of hours spending for TV watching) for sixth grade students and homework for eighth grade students. Locus of control representing student belief in his or her ability to control academic performance was found to have positive correlations with both English and mathematics achievement for sixth grade students.

Relationships of student effort variables with achievement Table 10 presents correlations of student effort variables with English and mathematics achievement. Engagement measured by student self-rating scale revealed statistically significant relationships with achievement in English for sixth grade students. Statistically significant relationships were found between effort variables and achievement: positive correlations between attendance rate and mathematics achievement for the eighth graders, between homework and English achievement for the eighth graders, between spare-time reading and English achievement for the

Table 10. Correlations between student efforts variables (engagement, attendance, homework, reading, & TV watching) and achievement^a

		English		Mathematics	
		6th	8th	6th	8th
<u>Student efforts</u>					
Engagement:	English	34***	13	18*	18*
	Mathematics	25**	21*	16	11
Attendance		-14	14	-14	20*
Homework		02	25**	01	18*
Reading		20*	-00	05	-11
TV watching		16*	19*	06	18*

^a

Decimal points have been omitted.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

sixth graders and between TV watching and English achievement in both sixth and eighth grade and mathematics achievement in eighth grade.

Relationships of socioeconomic status (SES), family type, and ability with teacher attitudes and clarity

Table 11 presents correlations of student background variables (SES, family type, and ability) with teacher attitudes and clarity. SES appeared to have statistically significant relationships with teacher expectations. In the sixth grade, teachers tended to have high expectations for

Table 11. Correlations of SES, family type, and ability with teacher attitudes and clarity^a

	SES		Family type		Ability	
	6th	8th	6th	8th	6th	8th
<u>Teacher attitudes</u>						
Expectations:						
English	29**	10	-04	07	62***	55***
Mathematics	32***	18*	13	18	44***	53***
Values:						
English	-11	02	-17*	-06	27**	-15
Mathematics	-10	01	-17*	-02	33***	-13
<u>Teacher clarity</u>						
English	-14	09	-02	-12	-04	01
Mathematics	-12	14	-14	-01	-09	05

a

Decimal points have been omitted.

* p < .05.

** p < .01.

*** p < .001.

the students who were from high status families. However, weak or insignificant relationships were found for the eighth grade students. In sixth grade, family type revealed negative but low correlations with teacher values reported by the students. That is, the sixth grade students who lived with natural mother and father tended to report their teacher placing less importance on school performance as compared to the students who lived with other than natural parents.

Student ability measure was highly correlated with teacher expectations for both sixth and eighth grade students (.44 to .62). Teachers tended to have high expectations for their students who had high level of previous ability as measured by standardized ability tests. Ability also showed positive relationships with teachers reported by the students in sixth grade.

Relationships of teacher attitudinal variables with clarity, student attitudes, efforts, and achievement

Teacher expectations for the student achievement and values on school learning were considered as teacher attitudinal variables in this study. Their correlations with teacher clarity, student attitudes, efforts, and achievement are presented in Table 12. Teacher expectations were found to have statistically significant relationships with student expectations, values, engagement, and achievement for both sixth and eighth grade students. Teacher expectations

Table 12. Correlations of teacher attitudinal variables (expectations and values) with clarity, student attitudes, efforts, and achievement^a

	Expectations:				Values:			
	English		Mathe- matics		English		Mathe- matics	
	6th	8th	6th	8th	6th	8th	6th	8th
<u>Teacher clarity</u>								
English	-02	05	-04	13	16	16	17*	20*
Mathe- matics	00	06	05	-08	12	34***	16*	31***
<u>Student attitudes</u>								
Expectations:								
English	44***	33***	42***	24**	08	23**	10	17*
Mathe- matics	37***	11	43***	31**	01	06	05	02
Values:								
English	26**	17*	15	-06	45***	37***	41***	34***
Mathe- matics	24**	21*	23**	-06	41***	35***	37***	40***
Locus of control	-18*	-08	09	-09	01	07	-03	09
<u>Efforts</u>								
Engagement:								
English	40***	26**	34***	08	24**	15	20*	15
Mathe- matics	30**	10	27**	-06	20*	33***	19*	36***
Attendance	-07	13	-07	08	-13	-08	-02	-05
Homework	21*	21*	-09	10	04	08	07	04
Reading	18*	-01	11	-03	08	12	13	13
TV watching	-00	22*	04	09	04	13	05	09
<u>Achievement</u>								
English	50***	60***	57***	51**	25**	-08	24**	-03
Mathematics	44***	54**	64**	56**	21*	-13	19*	-12

^a

Decimal points have been omitted.

* P < .05.

** p < .01.

*** p < .001.

particularly showed strong relationships with English and mathematics achievement with correlations ranging from .50 to .64. Teacher (English) expectations also appeared to have positive but low relationships with other student attitude and effort variables (locus of control and reading in sixth grade, TV watching in eighth grade, and homework in both sixth and eighth grade). Teacher values reported by the students were positively related to student own values with correlations ranging from .34 to .45. This variable also showed statistically significant correlations with teacher clarity, student engagement in mathematics class, and student expectations for English achievement in eighth grade.

Relationships of teacher clarity with student attitudes, efforts, and academic achievement Table 13 presents correlations of teacher clarity reported by the students with student attitude, effort, and achievement variables. Teacher clarity in English class was found to have statistically significant, positive relationships with student attitudes (expectations, values, and locus of control) and engagement in sixth grade. Clarity in English class revealed significant correlations only with engagement for eighth grade students. Teacher clarity in mathematics class, when compared to teacher clarity in English class, showed more strong relationships with student attitudes and effort variables. This tendency occurred in the eighth grade rather

than sixth grade although these were not tested statistically. The student attitude and effort variables, which showed relatively strong correlations with teacher clarity in eighth grade mathematics class were student values, locus of control, engagement, homework, and TV watching.

Table 13. Correlations of teacher clarity with student attitudes, efforts, and academic achievement^a

	Clarity:		Mathematics	
	English		6th	8th
	6th	8th	6th	8th
<u>Student attitudes</u>				
Expectations:				
English	22**	13	-11	17*
Mathematics	14	-03	-05	17*
Values:				
English	35***	06	18*	36***
Mathematics	14	03	09	46***
Locus of control	26**	15	17*	23**
<u>Efforts</u>				
Engagement:				
English	33***	18*	10	34***
Mathematics	32***	04	20*	32***
Homework	-11	-06	-15	36***
Reading	09	10	17*	11
TV watching	04	-03	-01	36***
<u>Achievement</u>				
English	-05	05	-09	-01
Mathematics	-01	02	-15	-04

^a

Decimal points have been omitted.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Testing the proposed models

A series of path analyses were conducted to test the hypothetical causal models for the prediction of academic achievement from socioeconomic status (SES) of the family with either parent expectation, involvement, student expectation, and effort or teacher expectation, clarity, student expectation, and effort serving as intermediating variables. The CAT taken in 1986 was found to be a significant predictor of both ITBS English and mathematics scores obtained in 1987. Student ability measured as CAT composite scores also appeared to significantly contribute to the formation of expectations from parents, teachers, and student themselves for academic achievement. Effects of student ability on subsequent achievement were statistically controlled by subtracting achievement scores predicted by student ability as measured by the CAT in 1986 from the ITBS scores obtained in 1987 for individual students. In very same manner, effects of ability on the formation of expectations (from parent, student, or teacher) were controlled. The resulting scores, that is, the residuals were respectively used as measures of academic achievement and measures of expectations from parents, teachers, and students for the proposed models in the study.

First, correlations of achievement controlled for student previous ability with the key variables included in

the path models of consideration are presented in Table 14. These correlations were calculated for sixth and eighth grade students as a whole group respectively. As shown in the table, statistically significant relationships remained between achievement and certain variables even after controlled for previous ability. Both residuals for parent and teacher expectations were found to have statistically significant and positive relationships with achievement regardless of grade level and subject area strongly indicating that the existence of parent and teacher expectation effects on student academic achievement.

Table 14. Correlations of residual achievement with variables included in the path models

	6th grade		8th grade	
	English (N=90)	Mathematics (N=92)	English (N=87)	Mathematics (N=85)
SES	.22*	.25**	.03	.15
residual parent expectation	.47***	.23*	.31**	.31***
parent involvement	.06	-.27**	.36***	.19*
residual teacher expectation	.27**	.31***	.36***	.19*
teacher clarity	.00	-.04	.15	.24*
residual student expectation	.23*	.03	.15	.24*
student effort	.15	-.06	.17	.09

* $p < .05$.

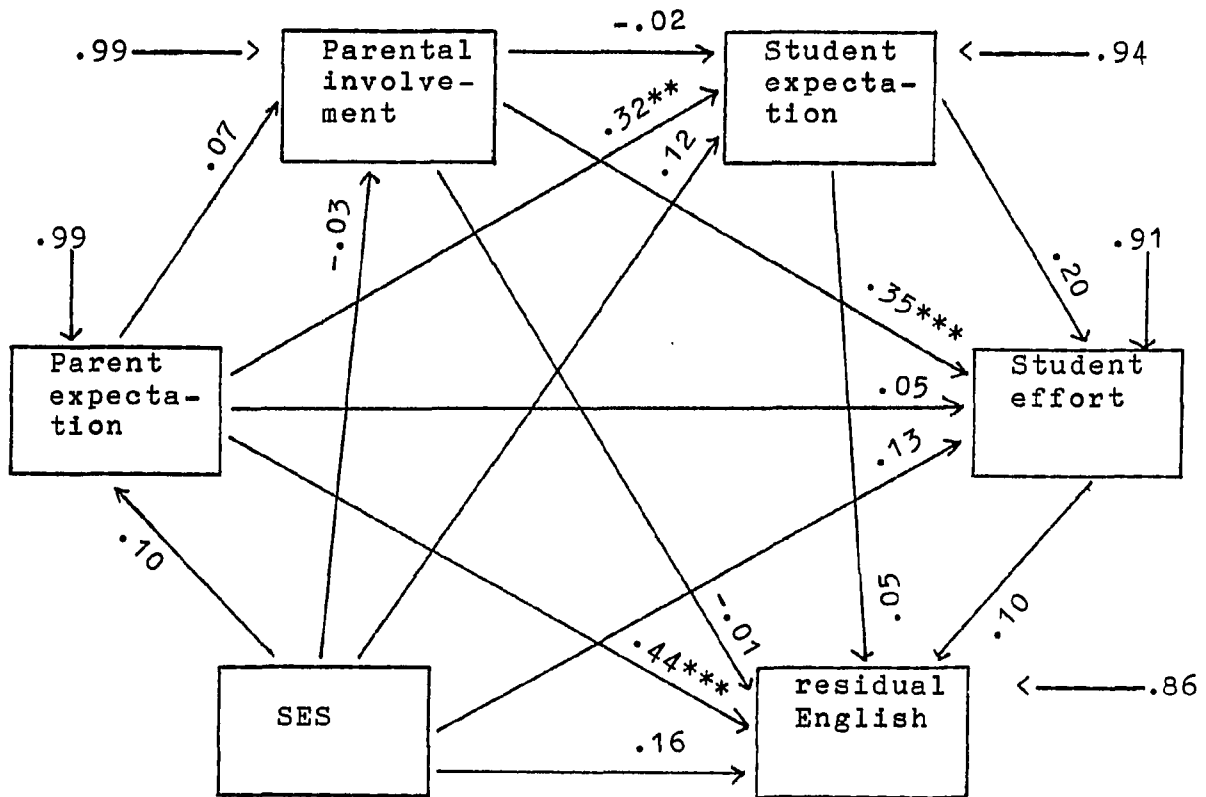
** $p < .01$.

*** $p < .001$.

Although SES still showed statistically significant relationships with achievement for sixth grade students, such relations diminished for eighth grade students. Parent involvement and student expectations (residuals) were also found to be significantly related with achievement in certain subject area of certain grade students. However, parent involvement revealed negative relationship with mathematics achievement even though this relation holds for only sixth grade students. Student effort showed relatively low correlations with achievement.

There are two general criteria for evaluating the size of the path coefficients: statistical significance and practical meaningfulness. With small samples such as that used in this study, even insignificant paths are seemingly meaningful. Therefore, statistical significance, with researchers often considering .05 level as being significant was considered in this study.

As depicted in Figure 5, for the sixth grade students, certain paths were found to be statistically significant: paths predicting English achievement from parent expectation, predicting student effort from parent involvement, and predicting student expectation from parent expectation. Twenty-six percent of the variance in English achievement, eighteen percent of the variance in student effort, and twelve percent of the variance in student expectation were



** p < .01.

*** p < .001.

Figure 5. Model predicting English achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as intermediating variables (6th grade, N=90)

respectively accounted for by the relations of the variables in the model. However, over ninety-nine percent of the variance in parent expectation and involvement remained unexplained by the variables included in the model.

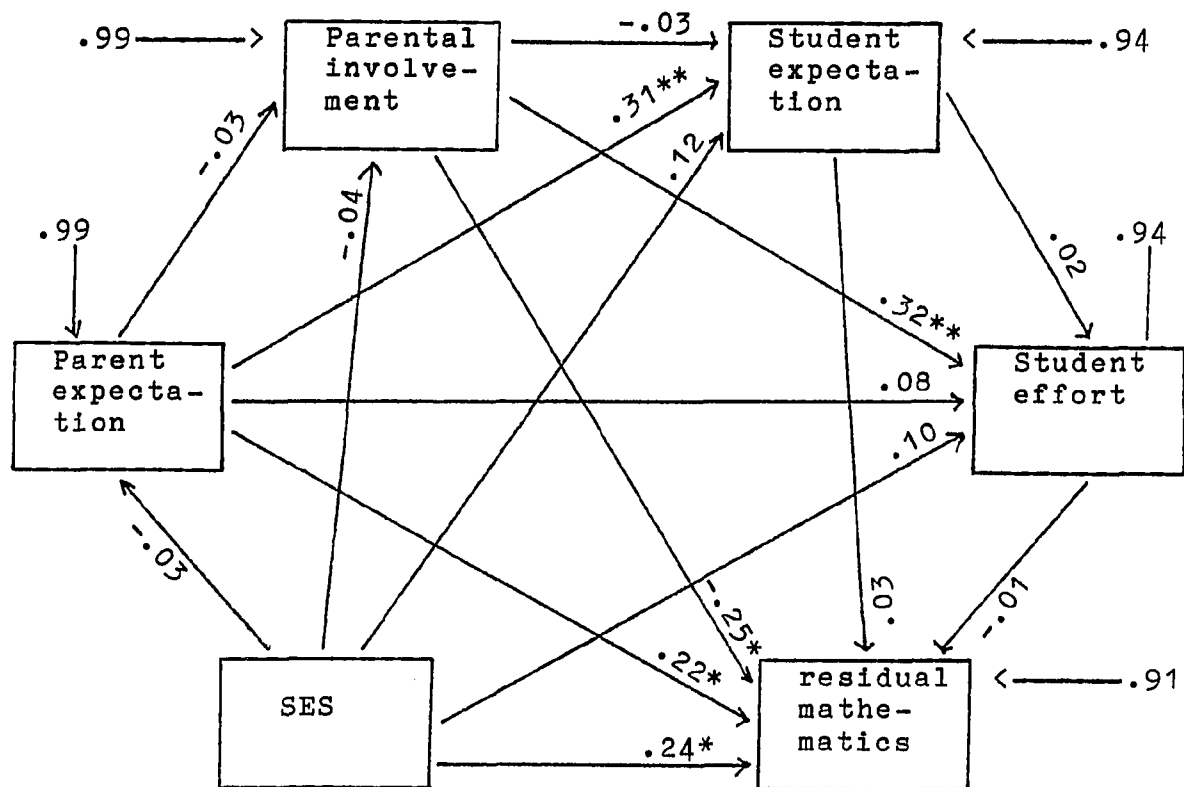
Separate analyses for sixth grade male and female students resulted in somewhat different findings (Figures 5a and 5b in Appendix B). However, since separate analyses were conducted with small number of subjects, there should be caution in drawing inferences from these findings. The findings in the model for female students were essentially similar to those in the model where the six graders were analyzed as a whole. In contrast, in the model for male students, only one path relating SES to English achievement appeared to be statistically significant. Twenty-three percent of the variance in English achievement in the model for male students and thirty-four percent of the variance in English achievement in the model for female students were respectively accounted for by their exogeneous variables in the model.

As shown in Figure 6, in the model for the eighth grade students, path predicting English achievement from parent expectation, path predicting student effort from parent involvement, and paths predicting both parent involvement and expectation from SES were found to be statistically significant. Approximately ten to twenty percent of the

variance in English achievement, student effort, and residualized student expectation was accounted for.

Separate analyses for the eighth grade male and female students revealed sex difference in the findings (Figures 6a and 6b in Appendix B). In the model for male students, only one path relating SES to parent involvement was found to be significant. None of paths predicting English achievement was statistically significant. Eight percent of the variance in achievement, twenty-nine percent of the variance in student effort, and eight percent of the variance in student expectation (residual) were respectively accounted for. In contrast, in the model for female students, path predicting English achievement from parent expectation (residual), path predicting student effort from student expectation (residual), path predicting student expectation (residual) from parent expectation (residual), and paths predicting parent involvement and expectation (residual) from SES were all found to be significant. Over thirty percent of the variance in English achievement and twenty-seven percent of the variance in student expectation were accounted for in the model.

Figure 7 presents model predicting sixth graders' mathematics achievement from SES, parent expectation, parent involvement, student expectation, and student effort. Paths predicting residuals for mathematics achievement from SES,



* $p < .05$.

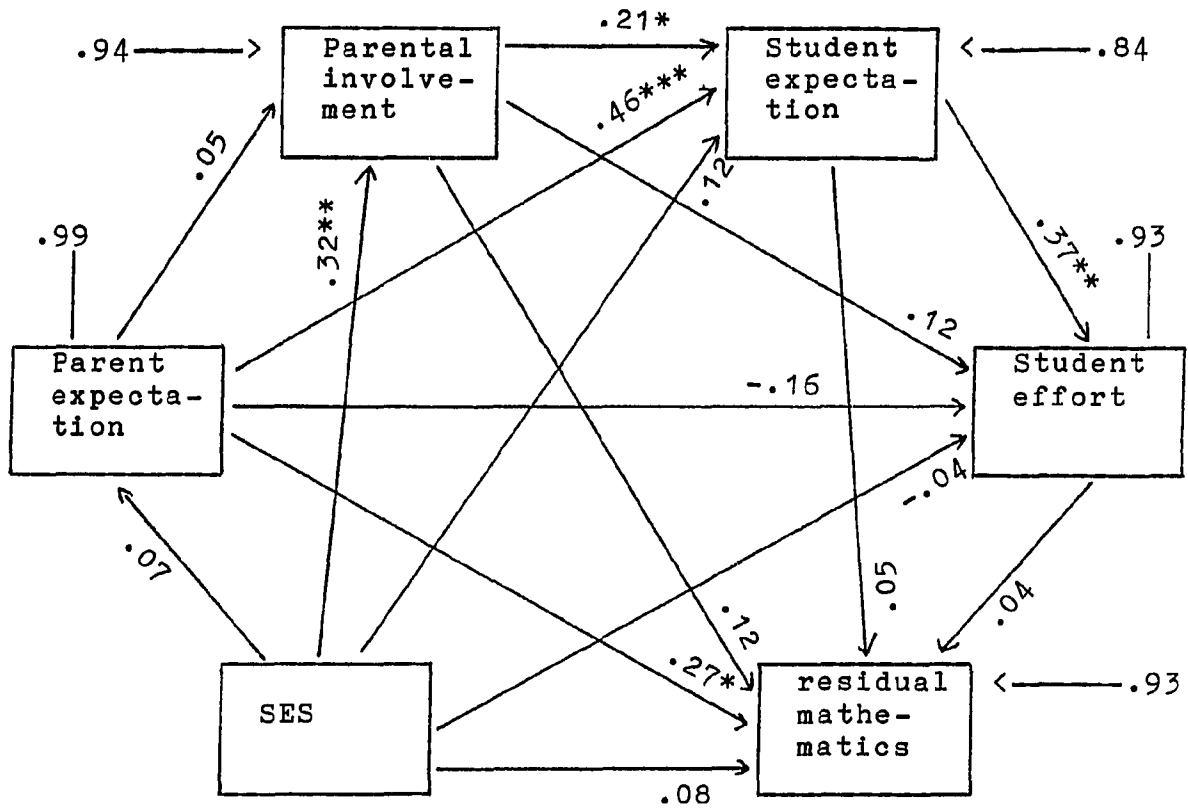
** $p < .01$.

Figure 7. Model predicting mathematics achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as intermediating variables (6th grade, N=91)

parent expectation, and parent involvement, path predicting student effort from parent involvement, and path predicting student expectation from parent expectation were found to be significant. Unexpectedly, parent involvement revealed negative relationship with achievement. Eighteen percent of the variance in residuals for mathematics achievement, eleven percent of the variance in student effort, and eleven percent of the variance in student expectation (residual) were accounted for by their corresponding exogenous variables included in this model. Almost all the variance in parent expectation (residual) and involvement remained unexplained.

Separate analyses for the sixth grade male and female students revealed different findings (Figures 7a and 7b in Appendix B). In the model for male students, paths predicting mathematics achievement from parent involvement and student expectation and path predicting student expectation from parent expectation appeared to be significant. Forty-six percent of the variance in residuals for mathematics achievement was accounted for in this model. In the model for the female students, paths predicting mathematics achievement from both SES and parent expectation and path predicting student effort from parent involvement revealed significance. Fourteen percent of the variance in mathematics achievement was accounted for.

The model depicted in Figure 8 is identical to the model



* p < .05.
 ** p < .01
 *** p < .001.

Figure 8. Model predicting mathematics achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as intermediating variables (8th grade, N=85)

in Figure 7, except that the analysis was conducted on data from the eighth grade students. Path predicting mathematics achievement from parent expectation, path predicting student effort from student expectation, paths predicting student expectation from both parent expectation and involvement, and path predicting parent involvement from SES were found to be statistically significant. Fourteen percent of the variance in residuals for mathematics achievement as measured by the ITBS test, fourteen percent of the variance in student effort, thirty percent of the variance in student expectation, and eleven percent of the variance in parent involvement were accounted for in this model.

Separate analyses for the eighth grade male and female students on mathematics achievement also revealed findings suggesting sex differences (Figure 8a and Figure 8b in Appendix B) in pattern of causal relations of the variables included in the models. In the model for male students, only two paths predicting student expectation from parent expectation and predicting parent involvement from SES were founded to be significant. None of paths predicting mathematics achievement appeared to be significant. Seven percent of the variance in mathematics achievement, eight percent of the variance in student effort, and thirty percent of the variance in student expectation were respectively accounted for. In the model for female students, path predicting

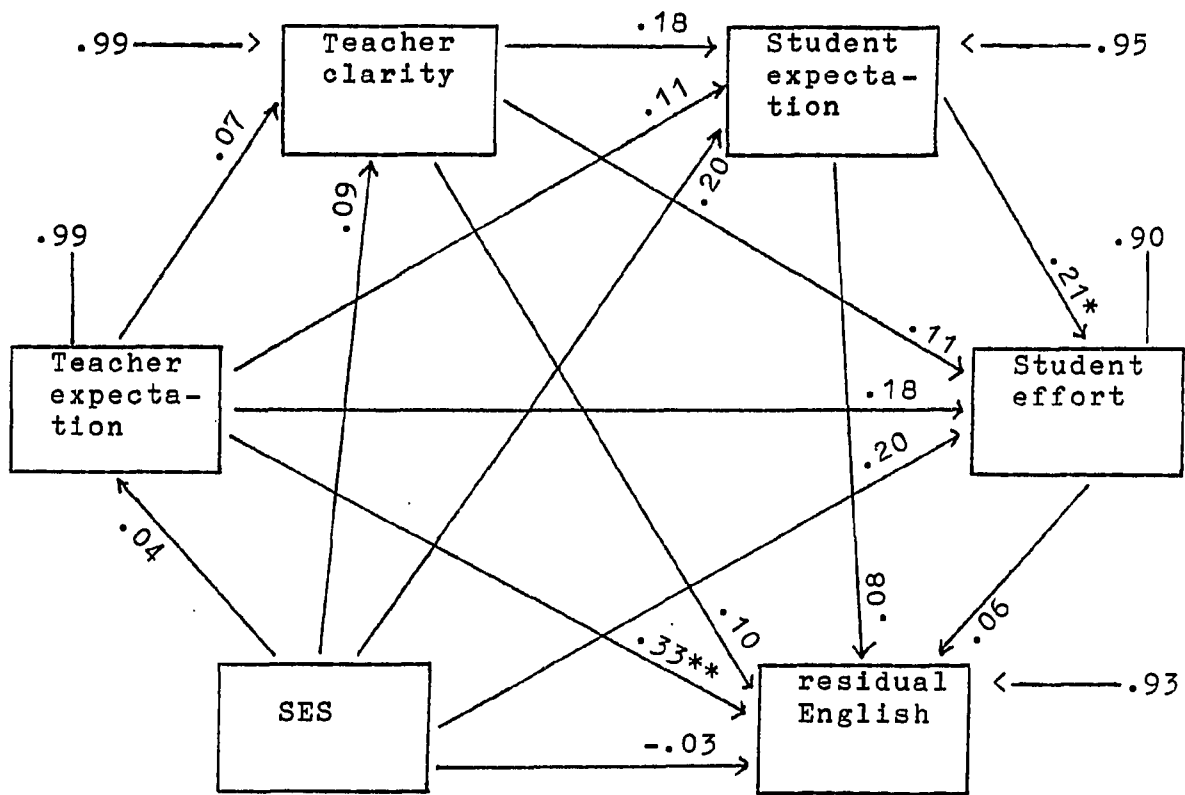
mathematics achievement from parent expectation, predicting student effort from student expectation, path predicting student expectation from parent expectation, and path predicting parent involvement from SES appeared to be statistically significant. Thirty-four percent of the variance in residuals for mathematics achievement was accounted for in this model whereas only seven percent of the variance in mathematics achievement was accounted for in the model for male students.

The models depicted in Figures 9 to 12 present those for predicting either English or mathematics achievement from SES, teacher expectation, clarity, student expectation, and effort with data obtained from the sixth grade and eighth grade students. As shown in Figure 9, for the sixth grade students, path predicting English achievement from teacher expectation, path predicting student effort from teacher clarity, paths predicting student expectation from teacher expectation and clarity, and path predicting teacher expectation from SES all appeared to be significant. Twelve percent of the variance in English achievement, nineteen percent of the variance in student effort, and twenty-three percent of the variance in student expectation were accounted for.

Results of separate analyses for male and female students are provided in Figure 9a and Figure 9b in Appendix B. For male students, paths predicting English achievement

from both SES and student expectation, path predicting student effort from teacher clarity, and paths predicting student expectation from teacher expectation and clarity appeared to be significant. Twenty-four percent of the variance in English achievement, nineteen percent of the variance in degree of student effort, and thirty-four percent of the variance in residuals for student expectation were accounted for. However, more than ninety-five percent of the variance in residuals for teacher expectation and clarity remained unexplained in this model. In the model for female students, path predicting English achievement from teacher expectation, path predicting student effort from teacher clarity, path predicting student expectation from teacher expectation, and path predicting teacher expectation from SES were found to be significant. Nineteen percent of the variance in English achievement, twenty-five percent of the variance in student effort, and seventeen percent of the variance in student expectation were respectively accounted for.

The model shown in Figure 10 is identical to model in Figure 9, except that analysis was performed on data obtained from the 8th grade students. Figure 10 shows only two paths being significant: path predicting English achievement from teacher expectation and path predicting student effort from student expectation. Fifteen percent of the variance in



* $p < .05$.

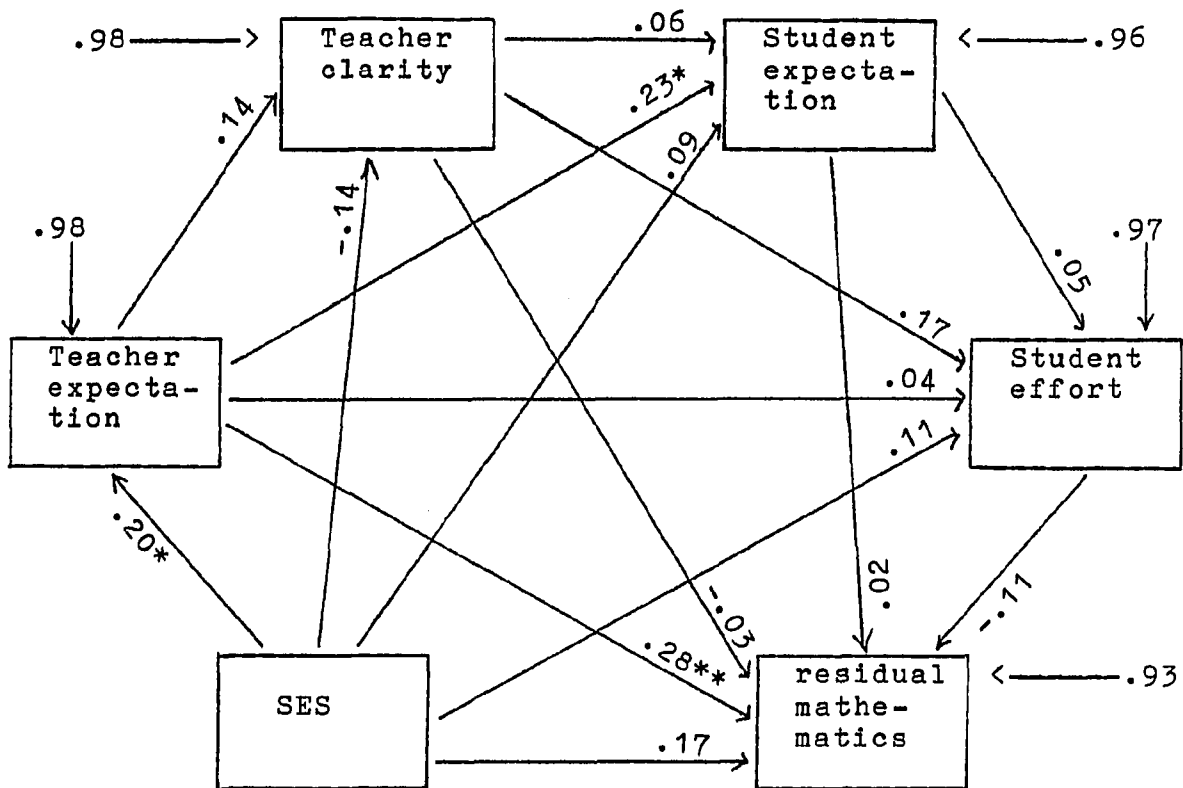
** $p < .01$.

Figure 10. Model predicting English achievement controlled for previous ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as intermediating variables (8th grade, N=87)

English achievement (residual), eighteen percent of the variance in student effort, and nine percent of the variance in residuals for teacher expectation (residual) were accounted for in this model.

Separate analyses for male and female students (Figure 10a and Figure 10b in Appendix B) revealed that none of paths for the male students were found to be statistically significant. However, significant proportions of the variance in English achievement (seventeen percent) and student effort (twenty-six percent) were accounted for. In the model for female students, path predicting English achievement from teacher expectation, path predicting student effort from student expectation, and path predicting student expectation from SES appeared to be significant. Sixteen to eighteen percent of the variance in student expectation, effort, and English achievement for female students were explained whereas less than five percent of the variance in other variables was accounted for.

As shown in Figure 11, in the model for the sixth grade students, three paths were found to be significant: paths predicting mathematics achievement and student expectation from teacher expectation and path predicting teacher expectation from SES. Except fourteen percent of the variance in mathematics achievement, relatively small proportions of the variance (three to six percent) in the



* $P < .05$.

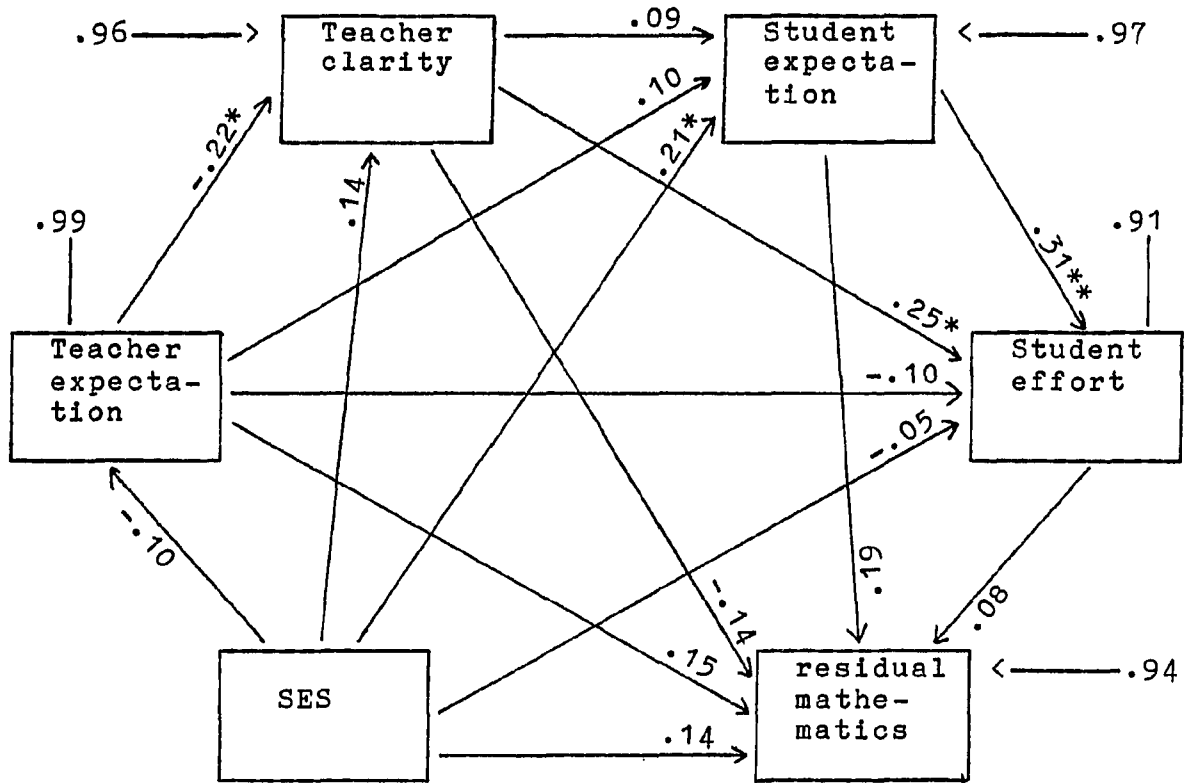
** $p < .01$.

Figure 11. Model predicting mathematics achievement controlled for previous ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as intermediating variables (6th grade, $N=92$)

other endogenous variables of the model were explained by their predictors in the model.

Separate analyses (Figures 11a and 11b in Appendix B) for the sixth grade male and female students revealed that only one path predicting mathematics achievement from student expectation was significant for the male students and thirty-three percent of the variance in mathematics residuals was accounted for in the model. Statistically significant path for the female students was the one predicting mathematics achievement from teacher expectation. Twenty-one percent of the variance in mathematics achievement was accounted for in this model. Over ninety percent of the variance in other variables remained unexplained in both models for male and female students.

Finally, Figure 12 presents findings for model predicting eighth grade mathematics achievement from SES, teacher expectation, clarity, student expectation, and effort. Paths predicting student effort from both teacher clarity and student expectation, path predicting student expectation from SES, and path predicting teacher clarity from teacher expectation were found to be significant. However, none of paths predicting mathematics achievement was statistically significant and teacher expectation (residual) was negatively related to teacher clarity. Twelve percent of the variance in mathematics achievement and eighteen percent



* $p < .05$.

** $p < .01$.

Figure 12. Model predicting mathematics achievement controlled for previous ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as intermediating variables (8th grade, N=85)

of the variance in degree of student effort were accounted for by their predictors.

Separate analyses for eighth grade male and female students showed that in the model for male students (Figure 12a in Appendix B) only two paths appeared to be significant predicting student effort from teacher clarity and predicting teacher clarity from teacher expectation. Twelve percent of the variance in mathematics achievement, thirty-one percent of the variance in student effort, and less than six percent of the variance in the other exogenous variables were accounted for. In the model for female students, two paths predicting mathematics achievement from student expectation and predicting student effort from student expectation were found found to be significant. Nineteen percent of the variance in mathematics achievement, twenty-four percent of the variance in student effort, and fourteen percent of the student expectation were respectively explained in models for male and female students.

DISCUSSION

Interpretations of correlational findings

A number of correlational coefficients were calculated to identify the nature of relationships between variables of interest in the study. As a result, the probability of obtaining correlation coefficients which are statistically significant might be considerably increased. Accordingly, in examining correlations, practical significance of the relations, as well as statistical significance levels will be considered as a criterion for interpreting the correlational findings.

Correlations of family and student ability variables with parent attitudes, involvement, student attitudes, efforts, and achievement

Socioeconomic status (SES) represented by a combined index of levels of the father's education and occupation and annual income of the family was positively related to both student expectations and to achievement in English and mathematics for sixth and eighth graders. Students from high status families tended to hold high expectations for their achievement and to score highly on standardized achievement tests. Approximately five to ten percent of the variance in student expectations, eight to twelve percent of the variance in achievement, and twenty-

five of the variance in parent expectations were accounted for by SES depending the student group. SES was also positively and significantly related to locus of control for sixth graders and parent expectations, aspiration, certain parent involvement variables (discussion and support), and student engagement for eighth graders. About five to sixteen percent of the variance in these variables was accounted for.

Family type, represented by whether the child lived with natural mother and father was positively related to parent expectation (English), involvement (support, visiting school and supervision), student expectation (English), student engagement (mathematics), and achievement for only eighth grade students. Five to eight percent of the variance in these variables was shared with the family type variable. In general, natural parents were more likely to hold high expectations for the child's achievement and to be involved in the child's educational activities. These children of natural parents also tended to hold high expectations, more actively engaged in classroom learning, and achieved higher level of performance compared to the students who did not live with their natural parents.

Findings of the study appear to support the contentions that home environment does not have an equally strong effect on all aspects of a child's scholastic development (Greaney, 1986) and that parental influence varies with the child's age

(O'Rourke, 1979).

As might be expected, student ability was most highly correlated with achievement for both sixth and eighth grade students. Fifty-six to seventy-one percent of the variance in English and mathematics achievement was explained by the ability measure, that is, the CAT composite scores. Ability was also positively related to parent expectations and aspiration and student expectations for sixth and eighth grade students, to student engagement for sixth grade student, and to watching TV (negatively coded number of hours spending for TV watching) for eighth grade. Twenty-two to thirty-four percent of the variance in parent expectations and twelve percent of the variance in student expectation were explained by the student previous ability. Parents whose child had high ability tended to hold high expectations and aspiration for the child. High ability students were also more likely to have high expectations for their achievement, be involved in classroom learning, and spend less time on watching TV. Findings here suggest that student ability is likely to be a significant contributor to the formation of both student and parent expectations.

Correlations of parent attitudinal variables with parent involvement, student attitudes, efforts, and achievement

Parent expectations revealed significantly positive relations with student expectations and achievement for sixth and eighth graders. Students for whom parents held high expectations were also more likely to hold high expectations for their achievement and actually showed high performance in standardized English and mathematics tests. Approximately nineteen to twenty-eight percent of the variance in student expectations and nine to forty-one percent of the variance in achievement were accounted for by parent expectations. These findings indicate that parents have strong potentiality influencing student learning. It strongly implies that parental partnership in educational productivity should be emphasized as Walberg (1984) suggested. Parent expectations were also positively related to parent supervision, student locus of control, spare-time reading, engagement for sixth graders. Parents who held high expectations for their child were more likely to pay attention to the child's activities outside home and their sixth grade children tended to have belief in their ability to control school performance, be involved in classroom learning, and spend more time on reading. About five to six percent of the variance in these variables were accounted for by parent expectations.

Parent values revealed statistically significant, and positive relationships with parent supervision, student values, and engagement for both sixth and eighth grade students and with parent discussion only for eighth grade. Even though there was considerable size of differences in their relations between two subject area, up to twenty-six percent of the variance in student values and less than ten percent of the variance in other variables were accounted for by parent values. Students whose parents reported by their child to place importance on school performance also tended to place importance on it. These relations appeared to be stronger for sixth graders than eighth graders. These findings suggest that younger children are more likely to internalize parent values.

Finally, parent aspiration was positively related to achievement for both sixth and eighth graders, student values for sixth graders, and student expectations for eighth graders. These relations were relatively weak: Five to thirteen percent of the variance in these variables was accounted for by the parent aspiration measure.

Correlations of parent involvement with student attitudes, efforts, and achievement Among four measures of parent involvement, only supervision variable revealed significantly positive relations with certain student attitude (values for sixth and eighth graders) and effort

(engagement for sixth and eighth grade and expectations, homework, and reading for only eighth graders) variables. Five to eighteen percent of the variance in these variables was accounted for by parent supervision. Both sixth and eighth grade students whose parents perceived by them to pay more attention to their activities outside home tended to place importance on school performance and be more involved in classroom learning so that these eighth graders were also more likely to hold high expectations for achievement and spend more time on homework and reading.

Correlations of student attitudinal variables with student efforts and achievement Student expectations had significantly positive relationships with engagement and achievement, indicating that approximately five to sixteen percent of the variance in engagement and eight to eighteen percent of the variance in achievement for both sixth and eighth graders were accounted for. High expectation students tended to be more involved in classroom learning and to achieve higher performance in English and mathematics. Eighth graders' expectations for mathematics achievement also appeared to hold significant relationships with attendance. That is, eighth graders holding high expectations for mathematics achievement tended to show high attendance rate.

Student values had significantly positive relationships with engagement for sixth and eighth grade students, with

homework for only eighth grade students, and with TV watching for sixth graders. Students who placed importance on school performance were more likely to be involved in classroom learning for sixth and eighth grades, spend less time on watching TV for sixth grade, and spend more time on reading for eighth grade. Locus of control appeared to have statistically significant correlations with achievement. These relations were, however, too low to have practical significance: only less than four percent of variance in achievement was accounted for by student locus of control.

Correlations of student effort variables with achievement It was assumed that student effort is a proxy variable of learning outcomes. Even though student effort variables revealed statistically significant correlations with achievement in certain subject areas, these relationships were relatively low. The highest relationships were found between student engagement and sixth grader English achievement and between homework and eighth grade English achievement. Twelve percent of the variance in English achievement for sixth grade and six percent of the variance of achievement in mathematics were respectively accounted for by the engagement measure.

Correlations of family and ability variables with teacher attitudes and clarity Socioeconomic status (SES)

of the family revealed significant relationships with achievement in English and mathematics for sixth grade students. Approximately ten percent of the variance in teacher expectations was accounted for by SES. Teachers tended to hold high expectations for students from high status families. Whether student lived with natural mother and father did not show practically significant relations with teacher attitude and clarity variables. Student ability was highly correlated with teacher expectations; for example, thirty-eight percent of the variance in expectation from sixth grade English teachers, thirty percent of the variance in expectation from eighth grade English and mathematics teachers, and nineteen percent of the variance in expectation from sixth grade mathematics teachers were respectively accounted for by ability measure, which was represented by the CAT composite scores taken one year before teacher expectations were measured. The findings imply explicitly that student ability might have significantly contributed to the formation of teacher expectations.

Correlations of teacher attitudinal variables with teacher clarity, student attitudes, efforts, and achievement

Teacher expectations for individual student achievement in English and mathematics appeared to have moderate relationships with student expectations and achievement for both sixth and eighth grade students. Students for whom teachers held high expectations tended to have high expectations and achieve high performance in English and mathematics. Ten to nineteen percent of the variance in student expectations and twenty-five to forty-three percent of the variance in achievement were accounted for by teacher expectation measures. Relationships of teacher expectations with student attitude and effort variables seemed to be stronger in sixth grade students than in eighth grade students although these were not tested statistically. These findings suggest that younger students tend to internalize teacher attitudes easily. Teacher expectations also had significantly positive, but low relations with student values and engagement. These relations held for only certain subject areas and grade levels.

Teacher values revealed positive relationships with student values. Students who perceived their teachers (English and mathematics) place importance on school performance were more likely to report importance of learning the subjects and of earning good grades. mathematics lessons.

Thirteen to twenty percent of the variance in importance of school learning reported by students was accounted by teacher values. Positive, but relatively low relations were found between teacher values and teacher clarity, student engagement, and achievement for only certain subject area or grade level.

Correlations of teacher clarity with student attitude, effort, and achievement variables Teacher clarity in English class reported by students was positively related to student expectations, values, locus of control, and engagement. These relations held for only sixth graders. Sixth grade students who perceived their English teacher provide clear teaching were more likely to hold high expectations for achievement, place importance on performance in English, be involved in classroom learning, and have belief in their ability to control achievement. However, these relations were somewhat low showing that five to thirteen percent of the variance in these variables was accounted for by teacher clarity measure.

In contrast to the findings of the teacher clarity in English class, significant relationships of teacher clarity in mathematics class with certain student attitude (values and locus of control) and effort (engagement, homework, and TV watching) variables were found only for eighth grade. Five to twenty percent of the variance in those variables was

accounted for by teacher clarity in mathematics class. Eighth graders whose mathematics teacher reported by the student to provide clear teaching tended to hold high values for school learning (mathematics), have a belief in their ability to control achievement, and exert more efforts on activities relevant to school learning. It was unexpected that achievement did not show any significant relationships with teacher clarity.

Evaluation of the path models

Although a number of path analyses on both English and mathematics achievement were conducted with regard to gender and grade level, basically two path models were tested for each of the following relationships:

- 1) Socioeconomic status was expected to lead an increase in achievement both directly and indirectly by increasing the levels of parent expectation, involvement, student expectation, and effort as mediating variables.
- 2) Socioeconomic status was expected to lead an increase in achievement both directly and indirectly by increasing the levels of teacher expectation, clarity, student expectation, and effort as mediating variables.

Expectations (from parents, teacher, and student) and academic achievement in these models were statistically controlled for student previous ability as measured by the CAT. When subtracting the part of achievement measure (ITBS scores) that could be accounted for by the CAT taken one year

prior to achievement measure, the resulting scores (residuals for English and mathematics) are assumed to reflect change.

Statistically significant paths for the models involving parent expectation controlled for student ability and involvement were presented in Table 17. For all the models, certain paths were found to be significant. Significant direct relation between socioeconomic status (SES) and achievement emerged for only sixth grade students in mathematics

Table 17. Summary of paths found to be significant for models involving socioeconomic status (SES), parent expectation (P-expectation), involvement, student expectation (S-expectation), effort and achievement

Grade	Subject	Paths exogenous -----> endogenous
6	English	P-expectation P-expectation involvement
	Mathematics	SES P-expectation P-expectation involvement involvement
8	English	SES SES P-expectation involvement
	Mathematics	SES P-expectation P-expectation involvement S-expectation

class. For sixth grade students, SES was predictive of the degree of changes in mathematics achievement. However, the relations appeared to be somewhat weak: Only six percent of the variance in mathematics achievement controlled for ability was accounted for by socioeconomic status.

The path relating parent expectation to achievement was found to be significant, regardless of subject areas and grade levels. Parent expectations controlled for the child's ability appeared to be a significant predictor of achievement level in English and mathematics. Path relating parent expectation to student expectation controlled for ability was also found to be significant except for the model involving achievement in eighth grade English. For both sixth and eighth grade students, parent expectation level was directly predictive of student expectation level as a moderating variable between parent expectation and achievement.

Separate analyses (Figure 5a to Figure 8b in Appendix B) for male and female students led to somewhat different patterns of causal relations of the variables in the models and increased the proportion of the variance in achievement for certain models that was accounted for. Paths relating SES to achievement in English for sixth grade male students and parent expectation for eighth grade female students were significant. More than half of paths relating parent

expectation to student expectation or achievement was also found to be significant while path relating student expectation to achievement was significant for only the model for sixth grade male students in mathematics class.

Although certain paths representing links between expectations (from both parents and student) and achievement were not found to be significant in the parent expectation models, most of the models accounted for a meaningful proportion of the variance in the endogenous variables, especially in achievement, student expectation, and effort. All of the signs of the path coefficients found to be significant were positive as hypothesized. The models of parent expectation effects appeared to support the hypothesis that parent expectations lead to different levels of student achievement and also support the hypothesis that SES influence the formation of parent expectations. However, direct relation between SES and achievement remained significant only for few models. It also seemed to be true that the hypotheses hold for the specific situations; Influence of parent expectation may vary with the child's sex, age, and even with subject area.

Table 18 presents significant paths for the models of teacher expectation. Paths relating teacher expectation controlled for student ability to achievement were significant for the models of sixth and eighth grade except

for eighth grade mathematics. Only for sixth grade, teacher expectations were directly predictive of student expectation level controlled for by student previous ability as a moderating variable between teacher expectations and achievement. However, path relating student expectation to achievement was found to be insignificant for all of the models although student expectation was directly predictive of degree of effort for eighth grade students.

Separate analyses for male and female students revealed considerably different patterns as did the separate models of

Table 16. Summary of paths found to be significant for the models involving socioeconomic status (SES), teacher expectation (T-expectation), clarity, student expectation (S-expectation), effort, and achievement

Grade	Subject	Paths	
		exogenous	-----> endogenous
6	English	SES T-expectation T-expectation clarity clarity	T-expectation S-expectation achievement S-expectation effort
	Mathematics	SES T-expectation T-expectation	T-expectation S-expectation achievement
8	English	T-expectation S-expectation	achievement effort
	Mathematics	SES T-expectation clarity S-expectation	S-expectation clarity effort effort

parent expectation. Teacher expectation controlled for by student previous ability was directly related to achievement in English for sixth and eighth grade female students and achievement in mathematics for sixth grade female students. For certain models, paths relating teacher expectation to student expectation and paths relating student expectation to achievement were also found to be significant. For all of the models of teacher expectation, except one for eighth grade male students in mathematics class, a meaningful proportion of the variance in achievement was accounted for. Certain models also accounted for a significant proportion of the variance in student expectation and effort as moderating variables between teacher expectation and achievement. Signs of path coefficients found to be significant in the models were positive as hypothesized except only one for relating teacher expectation to teacher clarity for eighth grade male student in mathematics class. Models of teacher expectation were generally equal to those of parent expectation effects in that they accounted for approximately same proportion of the variance in achievement although these were not tested statistically.

The models of teacher expectation effects also appeared to support the existence of teacher expectation effects. Teacher expectations seemed to directly and indirectly influence student expectations and achievement. These

relations, however, held for the specific situations as did the models of parent expectation effects. Teacher expectation effects tended to vary with student age, sex, and subject area. For instance, younger students (sixth graders rather than eighth grades) were more likely to be affected by the teachers. SES was significantly related to teacher expectations controlled for student previous learning ability indicating that student family status influence teacher expectations. However, these relations held for sixth grade students.

Although parent and teacher expectations were not major determinants of student achievement, that the correlation coefficients generated between variables in this investigation is encouraging. Moreover, significant causal links between parent and teacher expectations and student achievement were established. Thus the findings of this study provide support for the proposed path analytical models and these models provide a stronger framework for investigating complicated processes involved in parent or teacher expectation effects than previous models.

Limitations of the study

Certain limitations associated with the study are described here. First, it was, at the stage of sampling, expected that at least 200 to 250 subjects from each grade (sixth and eighth) would participate. However, data were collected for only 115 sixth graders and 109 eighth graders. This small sample size was especially problematic by in lowering statistical power.

Second, subjects of the study were not randomly selected, rather they voluntarily participated. Moreover, some cases were excluded from certain statistical analyses due to missing information on certain variable(s). Equal numbers of subjects were not secured for male and female students. These biases of sampling might contribute to bringing about a biased estimation of parameters.

Third, all subjects were drawn from populations of only three school buildings within two school districts. Moreover, two sixth grade teachers who participated in the study taught both English and mathematics courses and provided information on their expectations for student achievement in English and mathematics. Accordingly, the assumption of independence of observation might be threatened.

Fourth, 'time precedence' is a necessary condition for causal inference from correlational data. That is, for X to

cause Y, X must precede Y in time (Kenny, 1979). However, all variables of interest in this study, except for student ability as measured by the CAT in spring of 1986, were measured at almost same point in time, in spring of 1987. Hence, the assumption of causality represented in the path models might be threatened.

Implications for future research

Socioeconomic status was significantly related to teacher expectations only for sixth grade students when controlled for student previous learning ability. These results partially support the contention (cf., Dusek & Joseph, 1983) that teachers use social class information to form expectations. The findings seem to suggest that the formation of teacher expectations for younger students tend to be affected by social status of the family, but not for older students. As much as student learning relies on interpersonal relations (either or both of teacher-student and parents-child) and whenever teachers (or parents) treat student differently, expectation effects may occur. Thus, factors influencing the formation of expectations needed to be studied to fully understand the process the expectations are communicated to the student(s).

The data also indicate that expectation effects might

vary with student gender and or grade level. For example, teacher expectations were directly related to student expectations for sixth grade students, but not for eighth grade students. It has been generally assumed that younger children tend to be more readily affected by significant others such as parents and teachers (Brophy, 1977). Several studies (e.g., Hewison & Tizard, 1980; Hannon, 1987) with young children reported evidence supporting this assumption. Hewison and Tizard's (1980) study with children aged 7 and 8 found that parent involvement, among other family background factors, is most strongly related to reading achievement. In contrast, a study by Keith et al. (1986), which employed high school seniors, concluded that parent involvement had no direct effect on achievement but positively influenced the learning efforts as shown in this study. Student age, as well as sex, should be considered as an important mediating variables for studies on parent expectation or teacher expectation effects.

Although main interest of this study was in teacher expectation effects that are communicated to individual students, studies investigating how teacher expectations are communicated to a class as a whole are also needed. In fact, much of classroom instruction is group-oriented rather than individualized. Teachers are expected to interact with the class as a whole in ordinary classes. Thus, studies

determining size of teacher expectation effects employing class as a unit of analysis will also provide meaningful information.

The family is universally recognized as a fundamental institute educating the child. However, parent role with regard to school learning has been less emphasized. Some researchers (Callard, 1979; Moore, 1984) have hypothesized that developing parent expectations for student academic performance leads to an increase in student motivation and as a result also student achievement. Hannon (1987) provided empirical evidence that the reading attainment of working-class children might be improved by having their parents be more directly involved in the teaching of reading; that is, by having their children read at home. Practical strategies such as this need to be tested to determine if expectations could be improved and or if improved expectations and involvement would serve to bring about increase in student achievement. Future studies of environmental effects of the home and school should focus on the dimensions which are more alterable and proximal rather than fixed and distal such as socioeconomic status.

SUMMARY

This study was an attempt to provide additional information as to how the home and school environments contribute to student learning in middle schools. Employing data obtained from 115 sixth grade students and 109 eighth grade students, correlations between certain structural, attitudinal, and process variables of the home and school and selected student variables were generated. Additionally, path analytical models of parent expectation and teacher expectation effects on student achievement were tested.

Parent and teacher variables were significantly and positively correlated with student attitude, effort, and achievement variables. The attitudinal variables (i.e., parent expectations and aspiration and teacher expectations) revealed high correlations with not only achievement, but also with student attitudes (i.e., expectations) regardless of grade, gender, and subject area. Socioeconomic (SES) and student ability had significant relationships with expectations (from student, parent, and teacher) and academic achievement. Student previous ability, in particular, appeared to strongly influence subsequent achievement and expectations from student, parent, and teacher. Student expectations were also significantly related to achievement.

Relationships between both parent and teacher expectations and achievement still remained significant even after controlling for effects of student previous ability on subsequent achievement and expectations. These findings are supportive of the existence of parent and teacher expectation effects. However, the relationships between SES and achievement were greatly weakened after controlling for student ability and led to statistical insignificance for eighth grade students.

Results of path analyses revealed parent expectations were directly related to achievement regardless of subject area and grade level. Parent expectations were also directly predictive of student expectations as a mediating variable between parent expectations and student achievement for both sixth and eighth grade students. Although certain paths representing causal links between parent expectations and academic achievement were not found to be significant in the proposed models of parent expectation effects, most of these models accounted for a meaningful proportion of the variance in student achievement, expectations, and effort. All the signs of the path coefficients found to be significant were positive as hypothesized. The models of parent expectation effects appear to support the hypothesis that parent expectations lead to different levels of student achievement and also partially support the hypothesis that SES influences

formation of the parent expectations.

Teacher expectations were also directly related to student achievement. Paths relating teacher expectations to achievement were significant in the models for both sixth and eighth grades except for eighth grade mathematics. Teacher expectations were directly predictive of student expectations as a mediating variable between teacher expectations and achievement, but these relations held only for sixth grade students. The findings of teacher expectation effects also appear to support the existence of teacher expectation effects. Teacher expectations seem to directly and indirectly influence student expectations and achievement. Separate analyses for male and female students revealed a different pattern of causal relations of the variables included in the models. It also appears to be true that the hypotheses of parent and teacher expectation effects hold for the specific situations. Influence of parent or teacher expectations may vary with gender, grade level, and even with subject area.

Thus the findings of this study provide support for the proposed path analytical models and these models provide a stronger framework for investigating complicated processes involved in parent or teacher expectation effects than previous models.

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Finally, this dissertation is dedicated to my parents who have always encouraged me, especially to my loving mother who had been anxiously looking forward to my homecoming and passed away several months ago.

APPENDIX A. TABLES FOR RESPONSE DISTRIBUTIONS OF
QUESTIONNAIRE ITEMS

Table 3a. Characteristics of 6th grade and 8th grade students and their parents

Character- istics	Categories	6th grade		8th grade	
		f	%	f	%
Parents					
Type of family	Natural parents	82	71.3	77	70.6
	Others	33	28.7	32	29.4
Annual income of family	Below \$10,000	10	8.7	3	11.9
	\$10,000 - \$20,000	17	14.8	19	10.1
	\$20,000 - \$30,000	35	30.5	27	24.8
	\$30,000 - \$40,000	30	26.1	36	33.1
	\$40,000 - \$50,000	9	7.8	8	7.3
	Over \$50,000	9	7.8	5	4.6
	No response	5	4.3	1	.9
Education required for father's current job	No current job	4	3.5	2	1.8
	Less than high school education	10	8.7	11	10.1
	High school diploma	29	25.2	34	31.2
	High school diploma plus training	36	31.3	32	29.4
	Bachelor's degree	17	14.8	11	10.1
	Master's degree	5	4.3	4	3.7
	Doctoral degree	5	4.3	3	2.8
	No response	9	7.8	12	11.0
Father's education completed	Less than high school	5	4.8	7	6.4
	High school diploma	22	19.1	27	24.8
	High school diploma plus training	47	40.9	37	33.9
	Bachelor's degree	18	15.7	17	15.6
	Master's degree	10	8.7	7	6.4
	Doctoral degree	5	4.3	4	3.7
	No response	8	7.0	10	9.2
Discussing school progress with child	Nearly every schoolday	45	39.1	24	22.0
	Once or twice a week	44	38.3	35	32.1
	Twice a month	15	13.0	35	32.1
	Once a month	7	6.1	11	10.1
	Never	4	3.5	3	2.8
	No response	0	0	1	.9

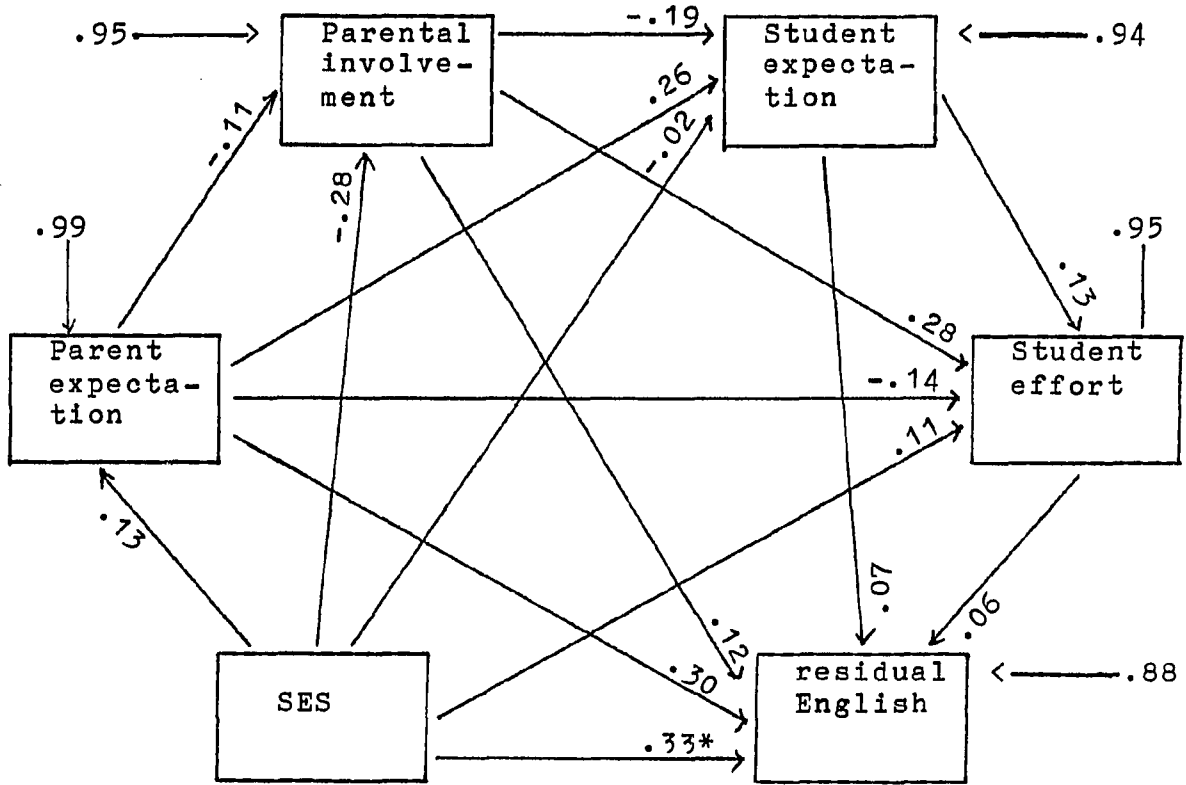
Table 5. (continued)

Character- istics	Categories	6th grade		8th grade	
		f	%	f	%
Discussing other school happenings with child	Nearly every schoolday	52	45.2	33	30.3
	Once or twice a week	31	27.0	33	30.3
	Twice a month	22	19.1	28	25.7
	Once a month	10	8.7	11	10.1
	Never	0	0	4	3.7
Discussing TV programs the child watches	Always	3	2.6	1	.9
	Most of time	24	20.9	18	16.5
	Occasionally	45	39.1	43	39.4
	Rarely	34	29.6	34	31.2
	Never/ no watching	9	7.8	13	11.9
Helping with homework when needed	Always	53	46.1	42	38.5
	Most of time	38	33.0	27	24.8
	Occasionally	19	16.5	22	20.2
	Rarely	4	3.5	13	11.9
	Never	1	.9	5	4.6
Visiting school to see how well the child is doing	Once a month or more often	8	7.0	4	3.7
	3, 4 times a year	46	40.0	20	18.3
	Twice a year	43	37.4	70	64.2
	Once a year	5	4.3	8	7.3
	Never	13	11.3	7	6.4
Knowing where the child is when s/he is away from home	Always	62	53.9	22	20.2
	Most of time	40	34.8	64	58.7
	Occasionally	6	5.2	17	15.6
	Rarely	6	5.2	2	1.8
	Never	1	.9	4	3.7
Knowing who the child is with when s/he is away from home	Always	53	46.1	20	18.3
	Most of time	48	41.7	53	48.6
	Occasionally	10	8.7	26	23.9
	Rarely	4	3.5	8	7.3
	Never	-	-	2	1.8

Table 5. (continued)

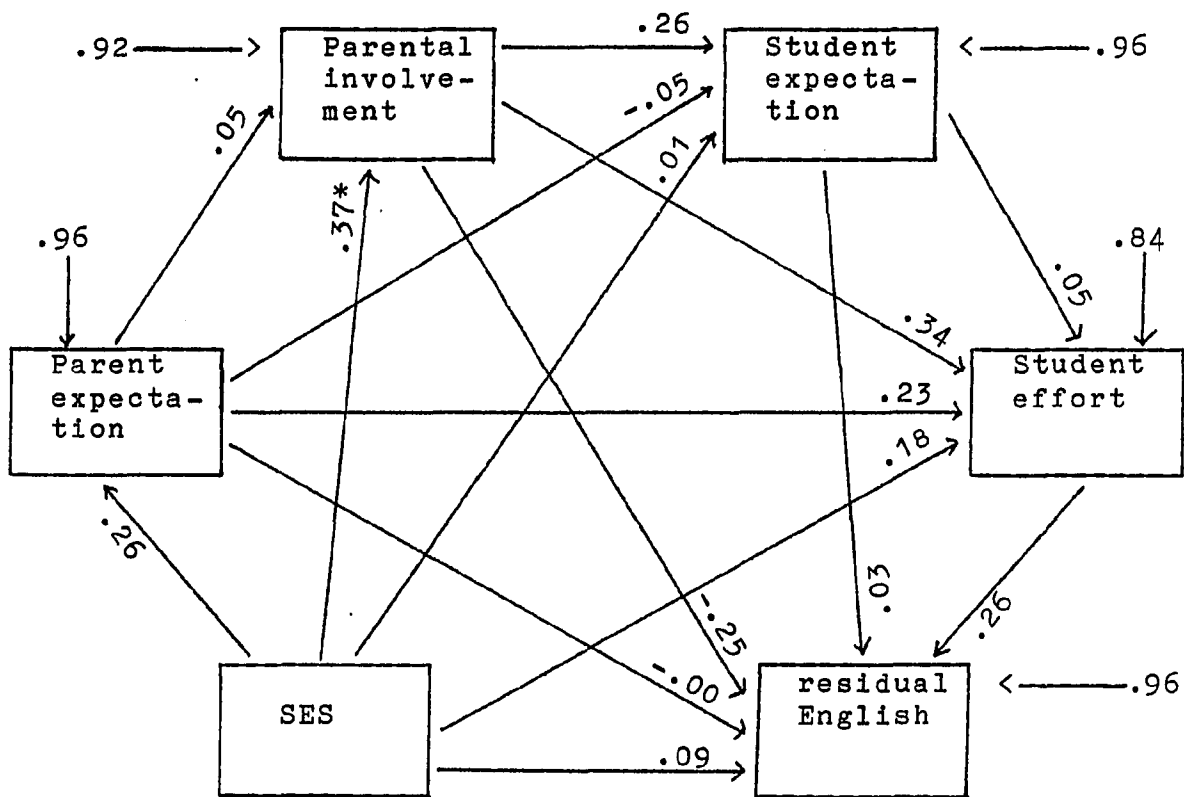
Character- istics	Categories	6th grade		8th grade	
		f	%	f	%
<u>Students</u>					
Hours spent for homework on English each week	Not assigned or do not do it	20	17.5	14	12.9
	less than 1 hour	37	32.2	47	43.1
	Between 1 & 2 hours	33	28.7	20	18.3
	Between 2 & 3 hours	13	11.3	8	7.3
	Between 3 & 4 hours	7	6.1	7	6.4
	Over 4 hours	4	3.4	11	10.1
	No response	1	.9	2	1.8
Hours spent for homework on mathe- matics each week	Do not do it	13	11.3	26	23.9
	Less than 1 hour	30	26.1	26	23.9
	Between 1 & 2 hours	33	28.7	27	24.8
	Between 2 & 3 hours	18	11.3	7	6.4
	Between 3 & 4 hours	11	9.5	10	9.2
	Over 4 hours	6	5.1	3	2.8
	Others	3	2.6	10	9.2
No response	1	.9	0	0	
Hours spent for watching TV each weekday	None	0	0	1	.9
	Less than 1 hour	8	7.0	10	9.2
	Between 1 & 2 hours	18	15.7	21	19.3
	Between 2 & 3 hours	28	24.3	25	22.9
	Between 3 & 4 hours	26	22.6	18	16.5
	Between 4 & 5 hours	16	13.9	12	11.0
Over 5 hours	19	16.5	22	20.2	
Hours spent for reading outside of school each weekday	None	12	10.4	30	27.5
	Less than 1 hour	25	21.7	38	34.9
	Between 1 & 2 hours	41	35.7	28	25.7
	Between 2 & 3 hours	21	18.3	8	7.3
	Between 3 & 4 hours	9	7.8	2	1.8
	Between 4 & 5 hours	4	3.5	1	.9
Over 5 hours	3	2.6	2	1.8	

APPENDIX B. ADDITIONAL FIGURES OF SEPARATE PATH ANALYSES
FOR MALE AND FEMALE STUDENTS



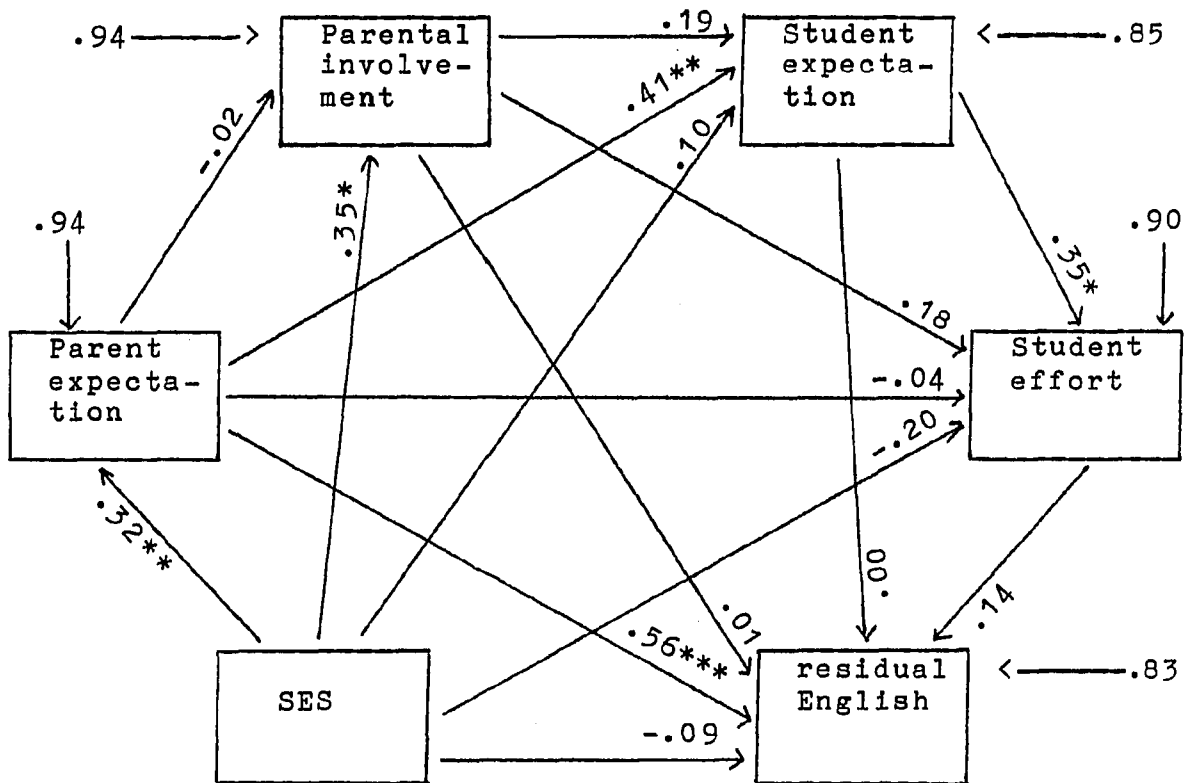
* $p < .05$.

Figure 5a. Model predicting English achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as mediating variables (6th grade boys, $N=39$)



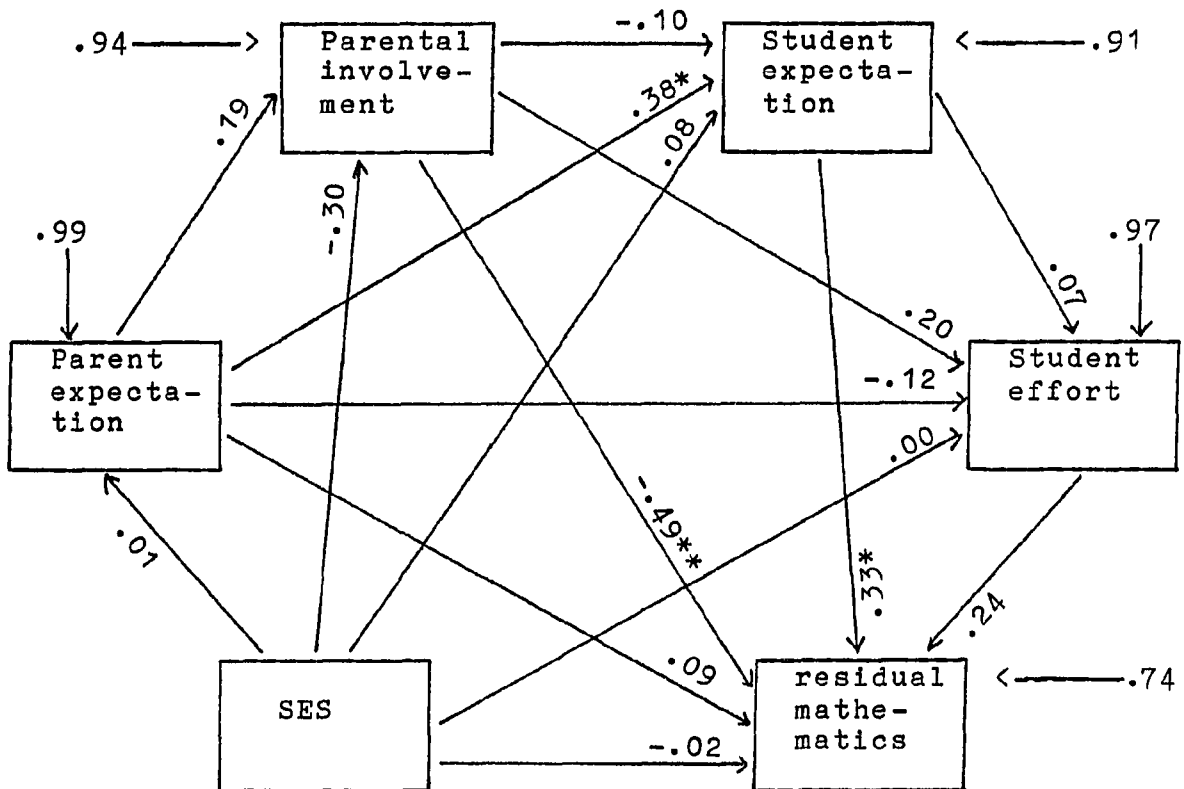
* p < .05.

Figure 6a. Model predicting English achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as intermediating variables (8th grade boys, N=33)



* $p < .05$.
 ** $p < .01$.
 *** $p < .001$.

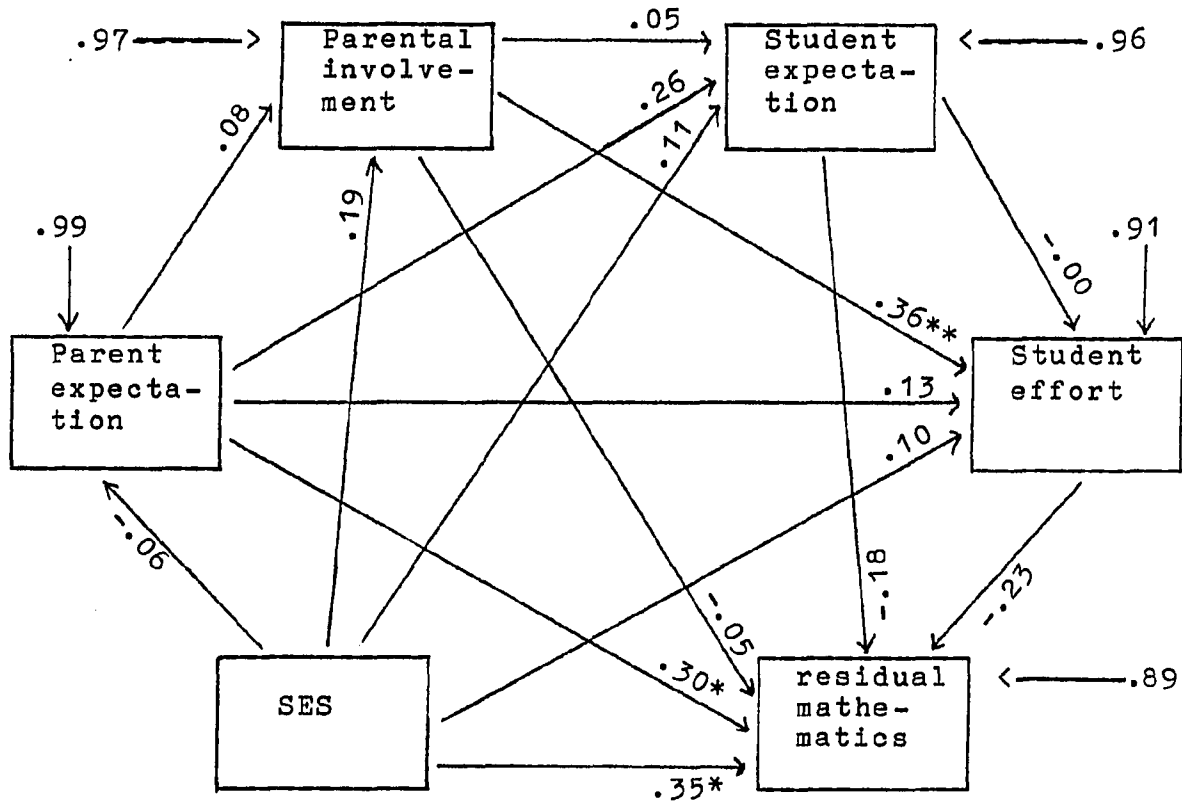
Figure 6b. Model predicting English achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as intermediating variables (8th grade girls, N=54)



* $p < .05$.

** $p < .01$.

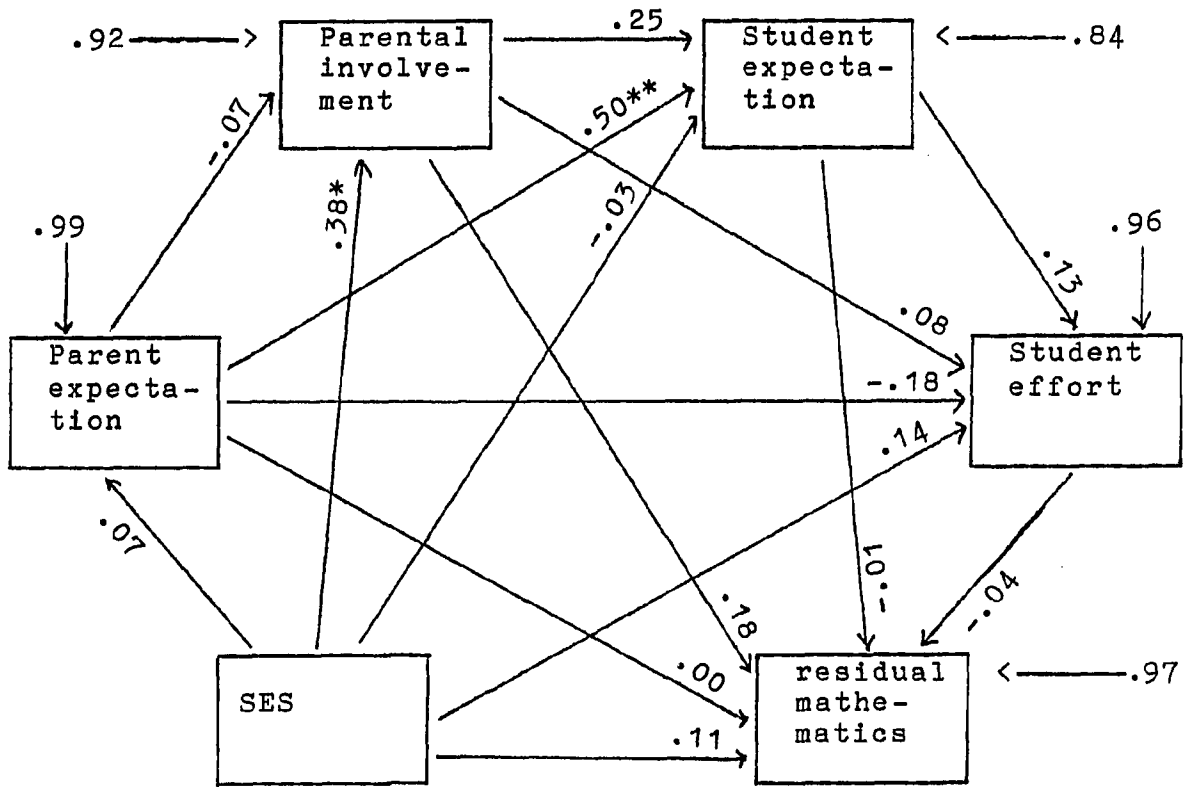
Figure 7a. Model predicting mathematics achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as mediating variables (6th grade boys, $N=39$)



* $p < .05$.

** $p < .01$.

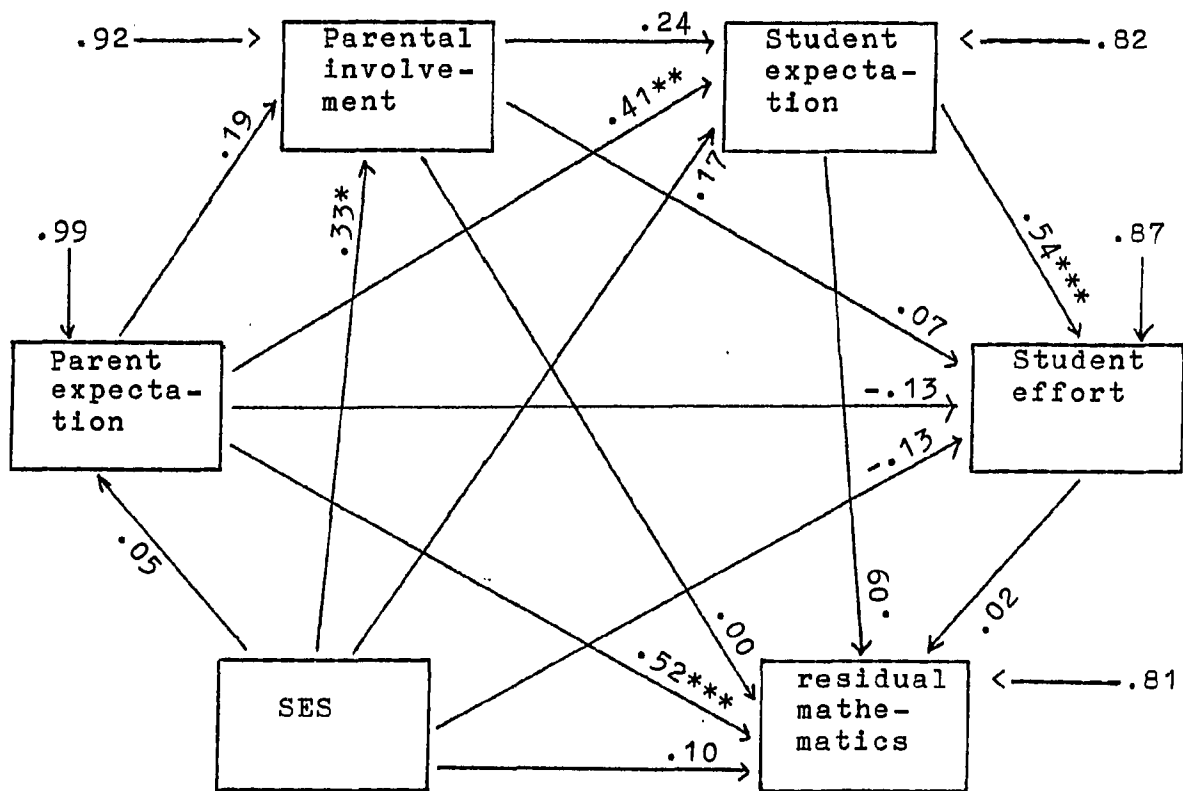
Figure 7b. Model predicting mathematics achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as mediating variables (6th grade girls, N=52)



* $p < .05$.

** $p < .01$.

Figure 8a. Model predicting mathematics achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as intermediating variables (8th grade boys, $N=33$)

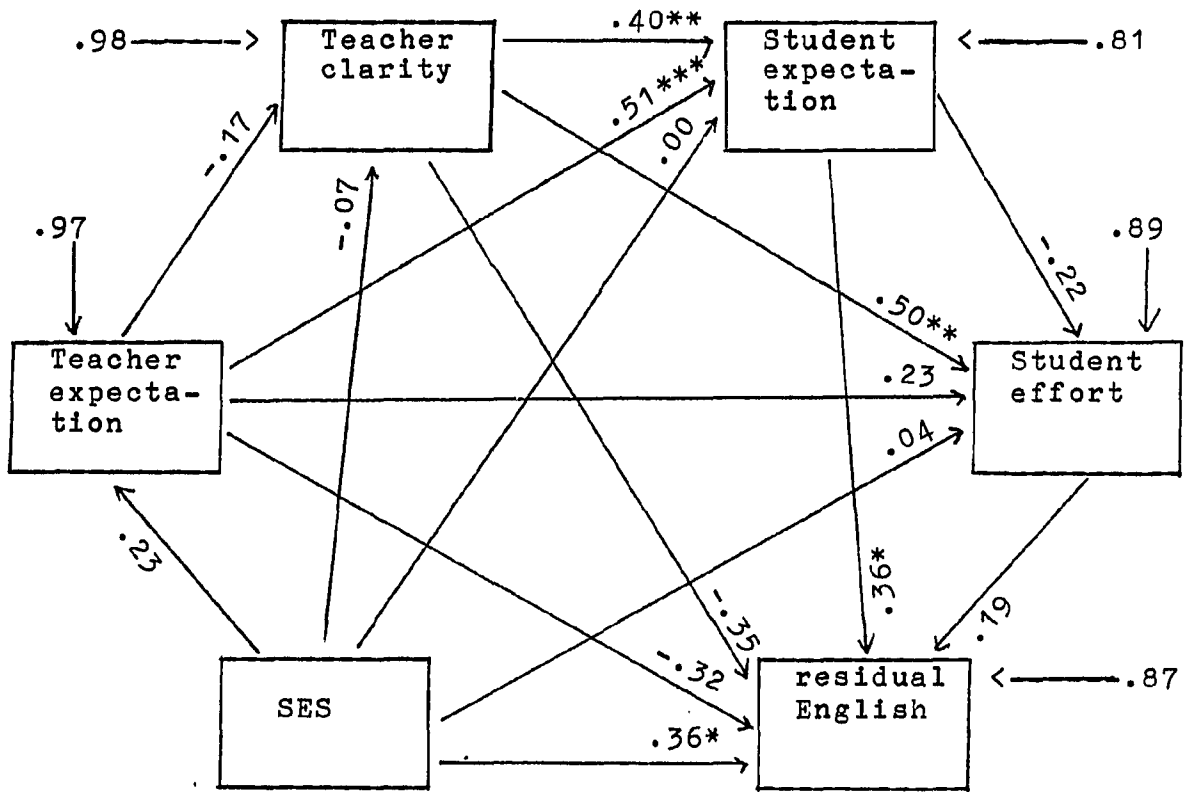


* $p < .05$.

** $p < .01$.

*** $p < .001$.

Figure 8b. Model predicting mathematics achievement controlled for previous ability from SES with parent expectation residual, involvement, student expectation residual, and effort as mediating variables (8th grade girls, $N=53$)

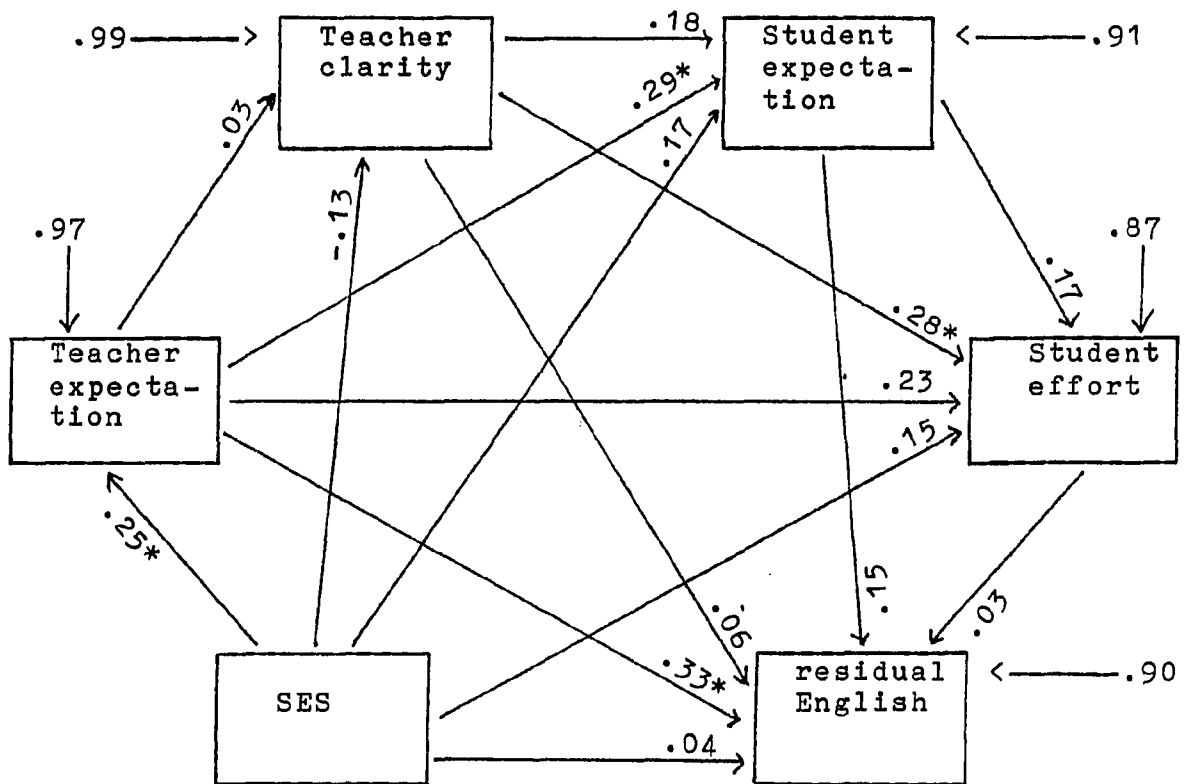


* $p < .05$.

** $p < .01$.

*** $p < .001$.

Figure 9a. Model predicting English achievement controlled for previous ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as intermediating variables (6th grade boys, N=39)



* $p < .05$.

Figure 9b. Model predicting English achievement controlled for previous ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as intermediating variables (6th grade girls, $N=51$)

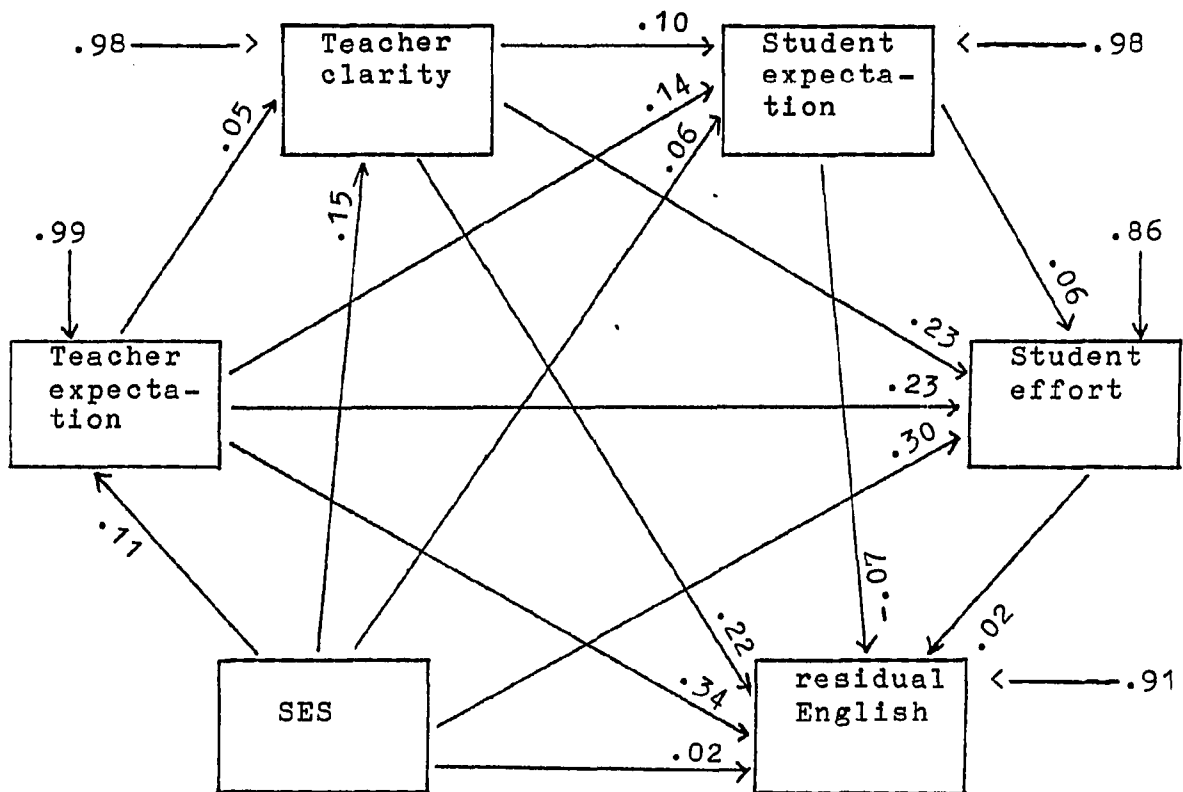
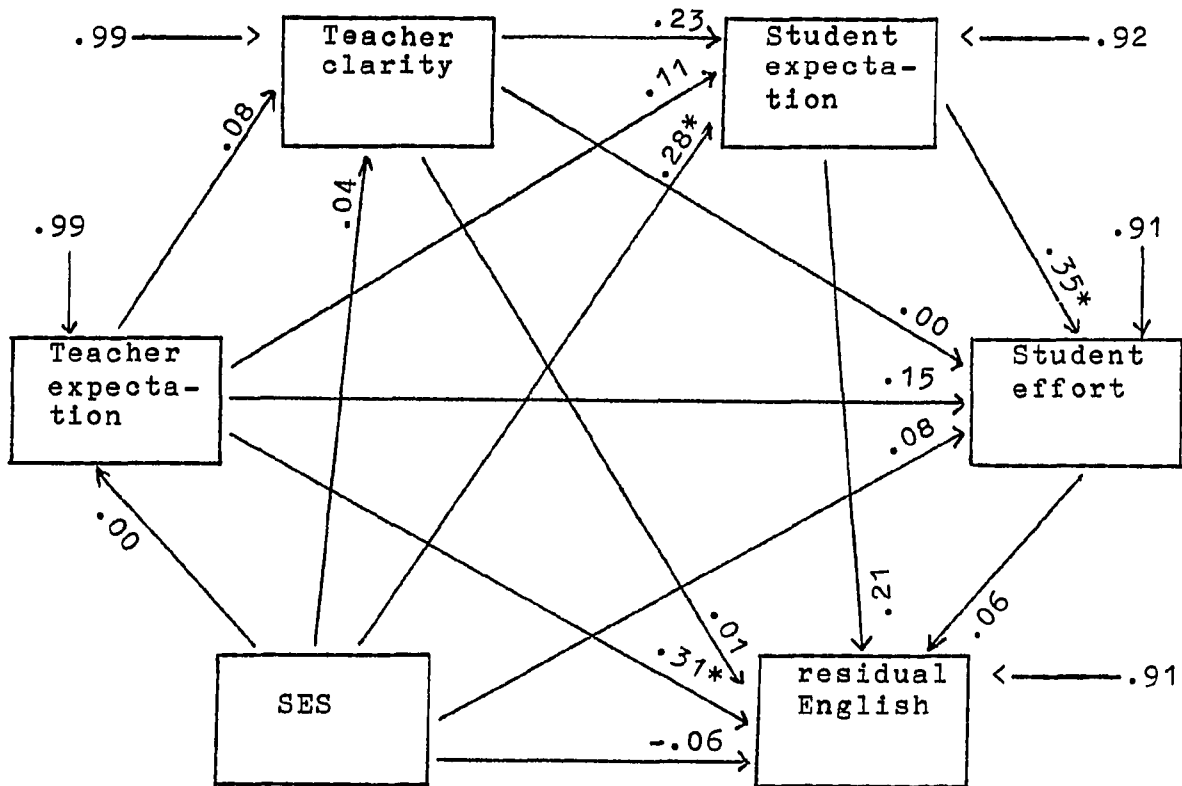
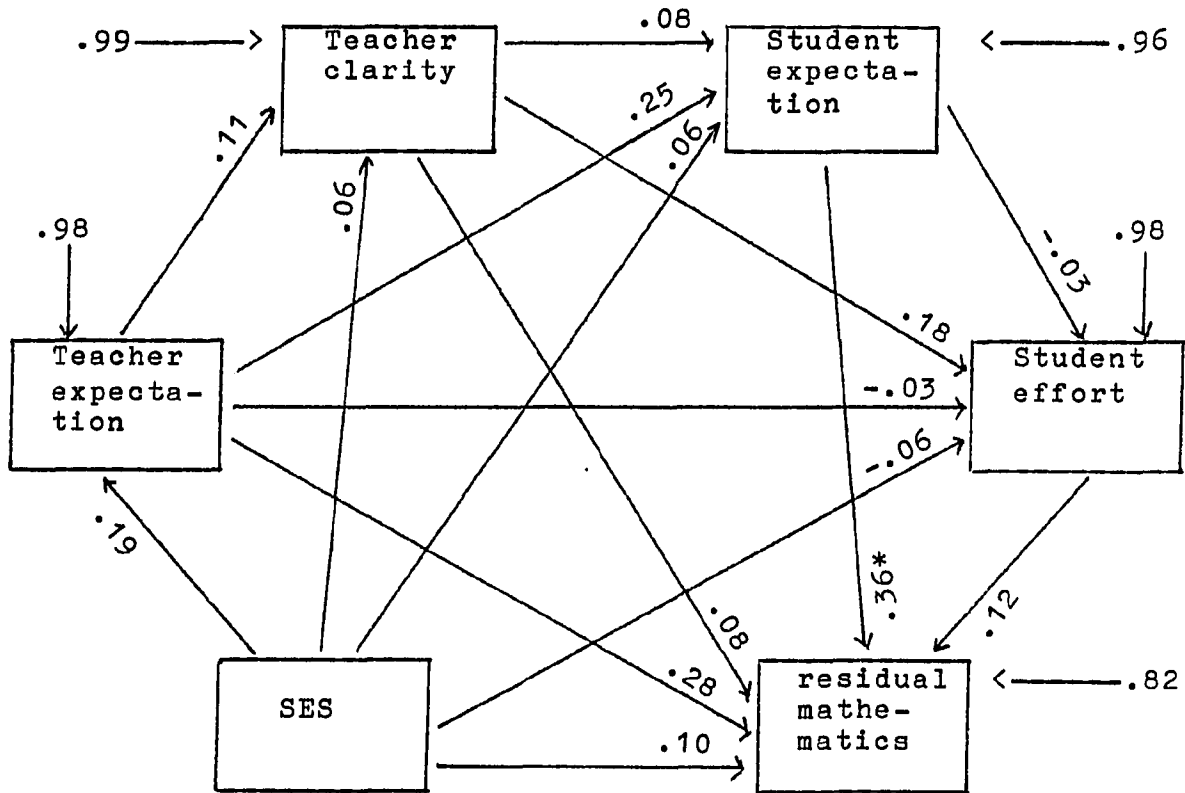


Figure 10a. Model predicting English achievement controlled for previous ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as intermediating variables (8th grade boys, N=33)



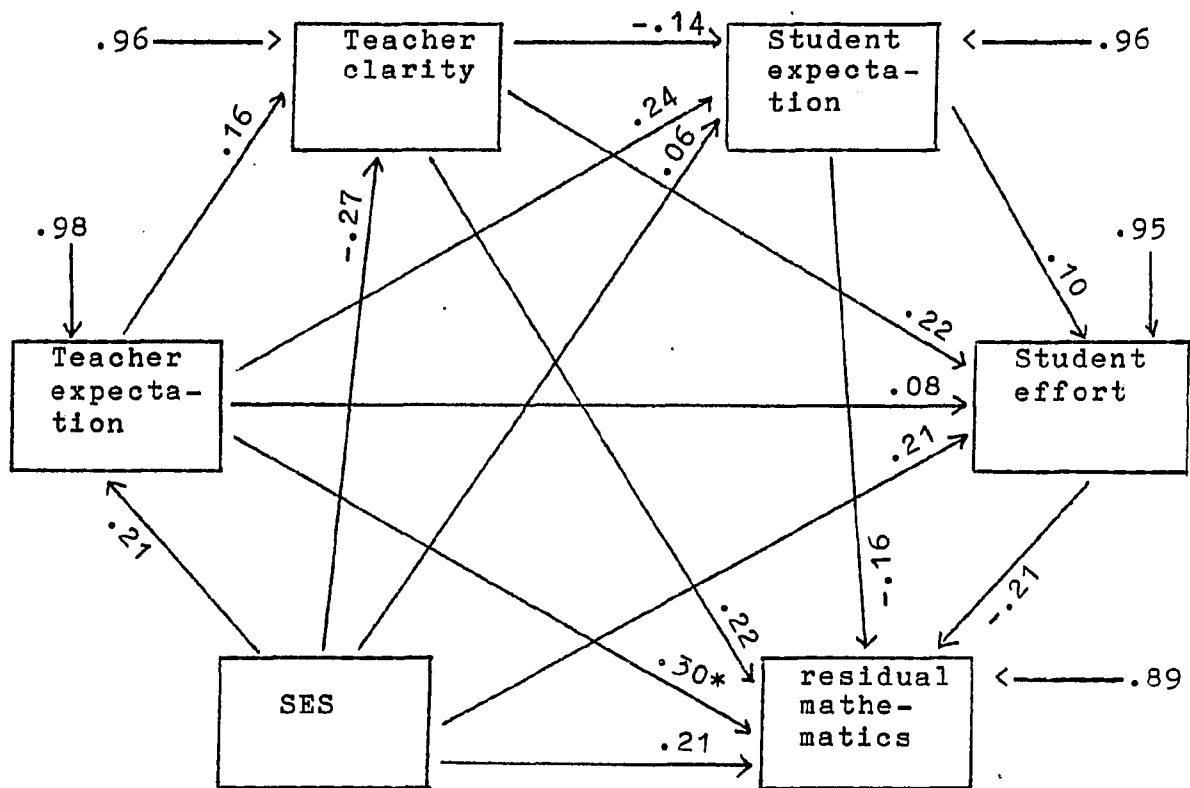
* $p < .05$.

Figure 10b. Model predicting English achievement controlled for previous ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as intermediating variables (8th grade girls, N=54)



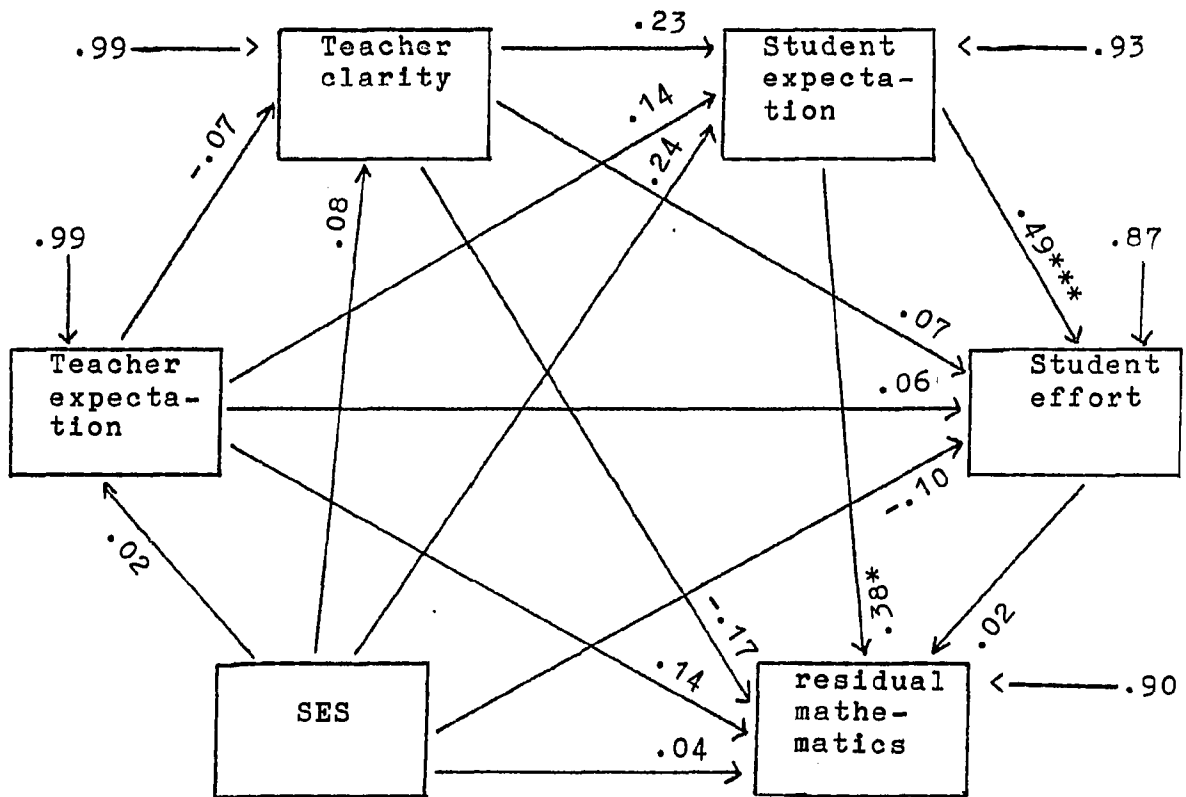
* $p < .05$.

Figure 11a. Model predicting mathematics achievement controlled for previous ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as intermedating variables (6th grade boys, N=39)



* $p < .05$.

Figure 11b. Model predicting mathematics achievement controlled for previous ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as mediating variables (6th grade girls, $N=53$)



* p < .05.

*** p < .001.

Figure 12b. Model predicting mathematics achievement controlled for cognitive ability from SES with teacher expectation residual, clarity, student expectation residual, and effort as intermediating variables (8th grade girls, N=53)

APPENDIX C. INSTRUMENTS: Parent questionnaire with cover
letter and permission form
Student questionnaire
Teacher rating form with cover
letter

Dear Parents,

I am a graduate student in the College of Education at Iowa State University and am conducting a study for my doctoral dissertation to examine the relationships between the home and school environment, student's attitudes toward schoolwork, effort on schoolwork, and academic achievement. The findings of this study will be useful to school officials as they plan programs and establish policies. Your child's school has agreed to participate in this study. We need your voluntary assistance in providing very important information about your family. The enclosed questionnaire will take you about three minutes to complete.

Also included in your packet is a form permitting your child to participate at school in this research project. In addition I am seeking your permission to have access to a current ITBS score, attendance record, cognitive ability score and recent grades. Should you agree to let your child participate, he or she will receive a questionnaire including questions about: 1) perceptions of teaching behaviors; 2) perceptions of parents' and teacher's expectations; 3) attitudes toward schoolwork; and 4) in-classroom and out-of-school learning activities. It will take about 15 minutes for your child to complete. Please note that his/her participation is voluntary. Information about achievement and attendance will be obtained from your child's school.


If you have children in both 6th grade and 8th grade, you may receive more than one parent questionnaire and permission form. If so, please complete all and return. You may be assured that your responses and that your child's responses will be absolutely confidential. Names will not be placed on the questionnaire. The information provided will be analyzed and reported in terms of group summarizations, not individual responses.

We thank you in advance for your cooperation in completing the questionnaire and for filling out the permission form that allows your child to participate in this study.

Sincerely,



Joon O. Lee
Research Assistant
College of Education
Iowa State University
Ames, Iowa 50011



Anton J. Netusil, Ph.D.
Professor of Research & Evaluation
College of Education
Iowa State University
Ames, Iowa 50011

Enclosures

P.S. Please have your child return your completed questionnaire and permission form to his/her teacher by April 24.

Parents' Permission Form

I give my permission for my child, _____
(name of child, please print)
to participate in the study on the "Effect of Home and School
Environment on 6th and 8th Grader's Performace in English and Math"
conducted by Joon O. Lee from Iowa State University. I also give
my permission for him to have access to my child's current ITBS
scores, grades, attendance and cognitive abilities records.
I understand that all information collected will be strictly
confidential and will only be used to report summary findings and
that my child can withdraw from the study at any time.

(parent's signature)

date: _____

Parents' Questionnaire

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*** Please indicate the categories that best describe you or your opinion by circling the appropriate number. Your responses should be related to your 6th/8th grade child. ***

1. What are the educational requirements of your current job?

<u>mother</u>	<u>father</u>	
1	1	no current job
2	2	job requires less than high school diploma
3	3	job requires high school diploma
4	4	job requires high school diploma plus some training college or trade school education
5	5	job requires bachelor's degree
6	6	job requires a master's degree
7	7	job requires a doctoral degree

2. How much education have you completed?

<u>mother</u>	<u>father</u>	
1	1	less than high school diploma
2	2	high school diploma
3	3	high school diploma plus some training college or trade school
4	4	bachelor's degree
5	5	completed a master's degree
6	6	completed a doctoral degree

3. Compared to other students, what grades or marks do you think your child is able to get in Math and English?

	<u>English</u>	<u>Mathe-</u> <u>matics</u>
very bottom of class	1	1
between bottom and average	2	2
average	3	3
between top and average	4	4
very top of class	5	5

4. How much education do you want your child to receive?

- 1) leave school as soon as possible and get a job
- 2) complete high school
- 3) receive professional training college after high school
- 4) complete bachelor's degree
- 5) complete a master's degree
- 6) complete a doctoral degree

5. What kind of job do you want your child to have as an adult?
- 1) no job
 - 2) job requires less than high school diploma
 - 3) job requires high school diploma
 - 4) job requires some training college or trade school education
 - 5) job requires a bachelor's degree
 - 6) job requires a master's degree
 - 7) job requires a doctoral degree
6. What is the average number of hours per weekday you want your child to spend on his/her homework?
- 1) no time expected
 - 2) as much time as he/she wants to
 - 3) 1 hour
 - 4) 2 hours
 - 5) 3 hours
 - 6) 4 hours
 - 7) 5 or more hours
7. Which of the following categories best describes total family pre-tax income during last year?
- 1) below \$10,000
 - 2) between 10,000 and 15,000
 - 3) between 15,000 and 20,000
 - 4) between 20,000 and 25,000
 - 5) between 25,000 and 30,000
 - 6) between 30,000 and 35,000
 - 7) between 35,000 and 40,000
 - 8) between 40,000 and 50,000
 - 9) above 50,000

*** We know your time is valuable. We appreciate your thought, effort, and time in completing this questionnaire. ***

Dear Student,

I need your help in conducting a study to learn more about what helps students learn. You can choose to help me by answering the questions in this booklet. The questions ask for your thoughts about your home and schoolwork.

Your answers will never be shown to anyone else. Read the directions carefully, and try to answer every question as accurately as you can. Thank you for your help with this project.

First, I would like to have some personal information about you.

1. What grade are you attending?

6th grade
 8th grade

2. What is your sex?

boy
 girl

3. Please check below all of your family members who are living in your home with you now.

<input type="checkbox"/> mother	<input type="checkbox"/> father
<input type="checkbox"/> stepmother	<input type="checkbox"/> stepfather
<input type="checkbox"/> foster mother	<input type="checkbox"/> foster father
<input type="checkbox"/> sister(s)	<input type="checkbox"/> brother(s)

Please indicate whether you agree or disagree with each of the following statements by circling the appropriate number.

3: Yes, I agree
2: between yes and no
1: No, I disagree

	<u>Yes</u>		<u>No</u>
4. Being a good student depends on hard work.	3	2	1
5. If a student is not doing well in his or her schoolwork, it is mainly because he or she does not work hard.	3	2	1
6. Good luck is more important than hard work.	3	2	1
7. If a student does better than usual in a subject at school, it probably happens because he or she tries harder.	3	2	1
8. When a student does not do well on a test, it probably happens because the test is especially difficult.	3	2	1

Next, I would like to ask you about your regular teacher(s). Please tell whether you agree or disagree with each statement below by circling numbers to the right of each statement. Your answers should not refer to any particular class hour or situation, but to your class and teacher in general.

3: Yes, I agree
2: Between yes and no
1: No, I disagree

The teacher of my English class

	<u>Yes</u>		<u>No</u>
9. explains what we are studying so I can understand it easily.	3	2	1
10. shows us clear examples of how to do our work.	3	2	1
11. repeats things when students do not understand.	3	2	1
12. asks questions to find out if we understand.	3	2	1
13. gives clear answers when we ask questions.	3	2	1
14. teaches in a step-by-step manner.	3	2	1
15. teaches at just right speed (not too fast and not too slow) so I can understand what we are learning.	3	2	1
16. gives us time to practice what we have just learned.	3	2	1
17. explains class assignments so I know exactly what to do.	3	2	1
18. repeats information that is important.	3	2	1
19. makes helpful comments on my assignments and tests.	3	2	1
20. knows how hard each student is working in his or her class.	3	2	1
21. knows what each student is doing during class time.	3	2	1
22. checks on how well I am doing.	3	2	1
23. is well prepared and ready to teach the lesson.	3	2	1
24. stresses importance of learning new material and skills in the class.	3	2	1

3: Yes, I agree
 2: Between yes and no
 1: No, I disagree

<u>The teacher of my Mathematics class</u>	<u>Yes</u>		<u>No</u>
25. explains what we are studying so I can understand it easily.	3	2	1
26. shows us clear examples of how to do our work.	3	2	1
27. repeats things when students do not understand.	3	2	1
28. asks questions to find out if we understand.	3	2	1
29. gives clear answers when we ask questions.	3	2	1
30. teaches in a step-by-step manner.	3	2	1
31. teaches at just right speed (not too fast and not too slow) so I can understand what we are learning.	3	2	1
32. gives us time to practice what we have just learned.	3	2	1
33. explains class assignments so I know exactly what to do.	3	2	1
34. repeats information that is important.	3	2	1
35. makes helpful comments on my assignments.	3	2	1
36. knows how hard each student is working in his or her class.	3	2	1
37. knows what each student is doing during class time.	3	2	1
38. checks on how well I am doing.	3	2	1
39. is well prepared and ready to teach the lesson.	3	2	1
40. stresses importance of learning new material and skills in the class.	3	2	1

Next, I would like to know what you usually do during each of following classes.

- 5: Always
 4: Very often
 3: Sometimes
 2: Rarely
 1: Never

	<u>in English class</u>					<u>in Mathematics class</u>				
41. I keep working even if it is noisy.	5	4	3	2	1	5	4	3	2	1
42. I lose my concentration too easily (look out the window, stare into space, look up at little noises, etc.).	5	4	3	2	1	5	4	3	2	1
43. I stick to the assigned task.	5	4	3	2	1	5	4	3	2	1
44. I give up when I have a difficult task.	5	4	3	2	1	5	4	3	2	1
45. I spend time doodling, talking, playing, etc.	5	4	3	2	1	5	4	3	2	1
46. I concentrate on my work (reading, writing, solving problems, listening, etc.).	5	4	3	2	1	5	4	3	2	1
47. I complete assignments on time.	5	4	3	2	1	5	4	3	2	1
48. I pay attention to my teacher	5	4	3	2	1	5	4	3	2	1

Now, I would like to have information about the importance of English and Mathematics and of getting good grades in each subject area. Please provide your answer by circling the appropriate number under each course.

49. How important is it to you to learn English and Math?

	<u>English</u>	<u>Mathe-</u> <u>matics</u>
not at all important	1	1
slightly important	2	2
moderately important	3	3
very important	4	4
extremely important	5	5

50. How important is it to your parents and teachers that you learn English and Math?

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	<u>English</u>	<u>Mathe-</u> <u>metics</u>
<u>your parents</u>		
not at all important	1	1
slightly important	2	2
moderately important	3	3
very important	4	4
extremely important	5	5

your teacher(s)

not at all important	1	1
slightly important	2	2
moderately important	3	3
very important	4	4
extremely important	5	5

51. How important is it to you to get good grades in English and Math?

	<u>English</u>	<u>Mathe-</u> <u>metics</u>
not at all important	1	1
slightly important	2	2
moderately important	3	3
very important	4	4
extremely important	5	5

52. How important is it to your parents and teachers that you get good grades in English and Mathematics?

	<u>English</u>	<u>Mathe-</u> <u>metics</u>
<u>your parents</u>		
not at all important	1	1
slightly important	2	2
moderately important	3	3
very important	4	4
extremely important	5	5

your teacher(s)

not at all important	1	1
slightly important	2	2
moderately important	3	3
very important	4	4
extremely important	5	5

This time, I would like to ask you about your parents' involvement in your schoolwork, your study habits, and other information related to school. Circle your answer.

53. How often do you and your parents discuss your school progress?

- 1) never
- 2) rarely (once a month)
- 3) occasionally (twice a month)
- 4) once or twice a week
- 5) nearly every school day

54. How often do you and your parents discuss other school happenings?

- 1) never
- 2) rarely
- 3) occasionally
- 4) once or twice a week
- 5) nearly every school day

55. How often do your parents help with your homework when you need assistance?

- 1) never
- 2) rarely
- 3) occasionally
- 4) most of time
- 5) always

56. How often do your parents look at your homework?

- 1) never
- 2) rarely
- 3) occasionally
- 4) most of time
- 5) always

57. How often do your parents visit your school or teacher(s) to see how well you are doing at school?

- 1) do not know
- 2) never
- 3) once a school year
- 4) twice a school year
- 5) three or four times a school year
- 6) once a month
- 7) more than once a month

58. How often do your parents know where you are when you are away from home?

- 1) never
- 2) rarely
- 3) occasionally
- 4) most of time
- 5) always

59. How often do your parents know who you are with when you are away from home?

- 1) never
- 2) rarely
- 3) occasionally
- 4) most of time
- 5) always

60. Do your parents have some rules requiring you to read or study for a certain amount of time daily at home?

- 1) yes
- 2) no
- 3) don't know

61. Compared to other students in your class, what grades do you think you are able to get in English and Math?

	<u>English</u>	<u>Mathe- matics</u>
very bottom of class	1	1
between bottom & average	2	2
average	3	3
between top and average	4	4
very top of class	5	5

62. What is the average amount of time you spend on studying for a test in English and Math?

	<u>English</u>	<u>Mathe- matics</u>
don't do it	1	1
about 1 hour	2	2
about 2 hours	3	3
about 3 hours	4	4
about 4 hours	5	5
5 hours or more	6	6

63. What is the average amount time you spend on homework each week for English and Math?

	<u>English</u>	<u>Mathe-</u> <u>metics</u>
not assigned	1	1
don't do it	2	2
less than 1 hour	3	3
between 1 and 2 hours	4	4
between 2 and 3 hours	5	5
between 3 and 4 hours	6	6
between 4 and 5 hours	7	7
over 5 hours	8	8

64. What is the average amount time you spend each weekday on reading in your personal time outside of school?

- 1) don't read during spare time
- 2) less than 1 hour
- 3) between 1 and 2 hours
- 4) between 2 and 3 hours
- 5) between 3 and 4 hours
- 6) between 4 and 5 hours
- 7) over 5 hours

65. What is the average amount of time you spend each weekday on watching TV?

- 1) do not watch TV
- 2) less than 1 hour
- 3) between 1 and 2 hours
- 4) between 2 and 3 hours
- 5) between 3 and 4 hours
- 6) between 4 and 5 hours
- 7) over 5 hours

66. What is the average number of books you read a month ?

- 1) none
- 2) 1
- 3) 2 (1 book per two weeks)
- 4) 3 (1 book per 10 days)
- 5) 4 (1 book per week)
- 6) 5 or more (more than 1 book a week)

Thank you for your cooperation!

Dear Teacher:

I need your help. I am conducting a study for my doctoral dissertation to examine relationships between educational environment and student's school learning. You can assist me by completing the attached forms. Your responses to these items, regarding students' behaviors in your classroom, very important. The information collected in this study will be useful to educational policy makers in making decisions on educational programs and policies.

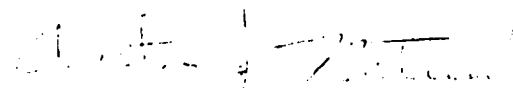
You may be assured of complete confidentiality. If you have any questions relating to the study and your role, please feel free to contact me.

I know a teacher's time is valuable. I appreciate your effort and time in completing these forms.

Sincerely yours,



Joon O. Lee
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E016 Lagomarcino Hall
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Ames, IA 50011
(515) 294-1941



Anton J. Netusil, Ph.D.
Professor of Research and Evaluation
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Ames, IA 50011
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APPENDIX D. APPROVAL OF HUMAN SUBJECTS COMMITTEE

INFORMATION ON THE USE OF HUMAN SUBJECTS IN RESEARCH
IOWA STATE UNIVERSITY

(Please follow the accompanying instructions for completing this form.)

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1. Title of project (please type): The Effects of Home and School Environment
on the Fifth and Eighth Graders' School Learning

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are properly protected. Additions to or changes in procedures affecting the subjects after the project has been approved will be submitted to the committee for review.

Joon-Ok Lee 3/30/87 Joon-Ok Lee
Typed Name of Principal Investigator Date Signature of Principal Investigator
E016 Lagomarcino Hall 294-1941
Campus Address Campus Telephone

3. Signatures of others (if any) Date Relationship to Principal Investigator
Dr. Anton J. Netusil 3/30/87 Major professor
Anton J. Netusil

4. ATTACH an additional page(s) (A) describing your proposed research and (B) the subjects to be used, (C) indicating any risks or discomforts to the subjects, and (D) covering any topics checked below. CHECK all boxes applicable.

- Medical clearance necessary before subjects can participate
- Samples (blood, tissue, etc.) from subjects
- Administration of substances (foods, drugs, etc.) to subjects
- Physical exercise or conditioning for subjects
- Deception of subjects
- Subjects under 14 years of age and(or) Subjects 14-17 years of age
- Subjects in institutions
- Research must be approved by another institution or agency



5. ATTACH an example of the material to be used to obtain informed consent and CHECK which type will be used.
 Signed informed consent will be obtained.
 Modified informed consent will be obtained.

6. Anticipated date on which subjects will be first contacted: April 10 '87
Anticipated date for last contact with subjects: May 31 '87

7. If Applicable: Anticipated date on which audio or visual tapes will be erased and(or) identifiers will be removed from completed survey instruments: July 31 '87
Month Day Year
July 31 '87
Month Day Year

8. Signature of Head or Chairperson Date Department or Administrative Unit
George G. Keras 3/30/87 Prof. Studies

9. Decision of the University Committee on the Use of Human Subjects in Research:
 Project Approved Project not approved No action required
George G. Keras 4/15/87 AKAAS