

**THE EFFECT OF SOCIO-ECONOMIC STATUS ON ACADEMIC  
ACHIEVEMENT**

A Thesis by

Jennifer Barry

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I have examined the final copy of this thesis for form and content, and recommend that it be accepted in partial fulfillment of the requirement for the degree of Master of Arts with a major in Sociology.

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Dr. David Wright, Committee Chair

We have read this thesis and recommend its acceptance.

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Dr. Kathleen Perez, Committee Member

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Dr. Brien Bolin, Committee Member

## **ABSTRACT**

This study addresses the increasing importance of student test scores by examining the different factors that influence test scores. Composite test scores of tenth grade students from the Educational Longitudinal Study of 2002 are examined using a four-part model which includes student role performance, school, family, and peer factors. Ordinary Least Squares analysis indicates that the strongest predictor of student test scores is socioeconomic status, resulting in a statistically significant increase in the standardized coefficient of .224 points. These results support previous research and possible directions for public policy are given.

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## **1. Introduction**

A person's education is closely linked to their life chances, income, and well being (Battle and Lewis 2002). Therefore, it is important to have a clear understanding of what benefits or hinders one's educational attainment. In 2002 federal legislation aimed at increasing student test scores through accountability was passed (Arce, Luna, Borjian, and Conrad 2005). Termed the No Child Left Behind act (NCLB), this legislation rewards schools that increase their student test scores with federal funding (Arce et al 2005). Because this legislation is specifically focused on test scores and directly affects schools it has become important to examine what factors influence student test scores. By gaining a better understanding of student test scores current federal legislation can be critically analyzed. This analysis can help determine whether or not current policies are benefiting students or if perhaps other policies would be more beneficial.

There are several topical areas that are most commonly linked to academic performance including Student Role Performance (SRP) factors, school factors, family factors, and peer factors. Student Role Performance is how well an individual fulfills the role of a student in an educational setting. Sex, race, school effort, extra-curricular activities, deviance, and disabilities are all-important influences on SRP and have been shown to affect test scores. School environment factors, such as school size, neighborhood, and relationships between teachers and students also influence test scores (Crosnoe, Johnson, and Elder 2004). One's family background has also been found to influence student test scores. Research has found that socioeconomic status, parental involvement, and family size are particularly important family factors (Majorbanks 1996). Peer influences can also affect student performance. Peer pressure and peer conformity can lead to an individual participating in risk-taking behaviors which have

been found to have a negative, indirect effect on test scores (Santor, Messervey, and Kusumaker 2000).

This study takes a holistic approach to analyzing the influence on test scores by creating a four-part model. This model includes many of the factors that have previously been linked to affecting test scores. It consists of Student Role Performance (SRP) factors, family-level factors, peer factors, and school factors. The Educational Longitudinal Study (ELS: 2002), a national probability database with over 15,000 tenth grade students in the United States, is used in this study to examine the effects of these factors on the test scores.

## **2. Literature Review**

### **2.1 Student Role Performance**

Student Role Performance (SRP) is how well an individual fulfills the role of a student in an educational institution. SRP involves factors such as, sex of the student, students' race/ethnicity, school effort, extracurricular activities, deviant behavior, and student disabilities.

The affect that sex has on a student's academic achievement has been debated and heavily researched over the past several decades (Chambers and Schreiber 2004, Eitle 2005). Past research has indicated an academic achievement gap between the sexes, with boys ahead of girls. However, more recent research has shown that the achievement gap has been narrowing and that in some instances girls have higher academic achievement than boys (Chambers and Schreiber 2004). For example, girls have been found to exert more effort at school, leading to better school performance (Ceballo, McLoyd, and Toyokawa 2004). Additionally, studies show that girls perform better in reading than males (Eitle 2005). But, males are found to outperform females in mathematics and science (Eitle 2005). Still, other research has found little to no difference in achievement between the sexes. (Chambers and Schreiber 2004).

Race has been shown to play a major role in the life of a student (Battle & Lewis 2002, Crosnoe, Johnson, and Elder 2004a, Tam and Basset 2004, Seyfried 1998). Numerous studies have found non-White, minority students to be at a disadvantage and to reach lower academic achievement than Whites (Battle et al 2002, Crosnoe et al 2004, Tam et al 2004, Seyfried 1998). In particular African-American and Hispanic students have lower test scores. For example, African-American students scored significantly lower on the 1991-1992 SAT assessments than White students (Seyfried 1998). African-American students are also more likely to be placed in lower academic groupings and less likely to be in academic groups for “gifted” students (Seyfried 1998). Both African-American and Hispanic students are more likely to feel disconnected from their school and peers which leads to lower academic achievement (Crosnoe et al 2004a). Research also shows that African-American students tend to invest less in school and therefore do not perform as well as White students (Crosnoe et al 2004a). It is thought that minority students, especially African-American students come to expect discrimination in school and believe that racial prejudice will outweigh their effort (Battle and Lewis 2002). This lack of investment in school has been connected not to a lack of ability, but rather, a reaction to the racial prejudice and discrimination that minority students face in the classroom and other areas of life (Battle and Lewis 2002, Seyfried 1998).

William Carbonaro defines school effort as “ the amount of time and energy that students expend in meeting the formal academic requirements established by their teacher and/or school” (2005). Carbonaro (2005) has also identified three different types of school effort. These are: rule oriented effort (showing up to and behaving in class), procedural effort (meeting specific class demands such as completing assignments on time), and intellectual effort (critically thinking about and understanding the curriculum). It is expected that a student who puts

forward significant effort in all three categories will perform the best (Carbonaro 2005). And studies have shown that school effort is an indicator of academic performance (Ceballo et al 2004, Carbonaro 2005). Typically effort has been positively linked with test scores and academic performance in both direct and indirect ways. Some studies have shown that high student effort leads to greater educational values, which in turn indirectly affects student performance (Ceballo et al 2004, Carbonaro 2005). Effort has also been linked to higher student grade point averages (GPA) (Carbonaro 2005). Effort has been measured in a variety of ways ranging from time spent on homework to attentiveness in class and all have been positively linked with school performance (Carbonaro 2005).

A consensus on whether or not a student participating in extracurricular activities, such as sports or clubs, will have a positive effect on academic performance has not been reached. From a theoretical point of view extracurricular activities are viewed as boosting academic performance (Hunt 2005). James Coleman's multiple role theory posits that extracurricular activities provide additional, complimentary roles for a student that benefits the student academically because the added role of athlete, for example, increases self-esteem and overall participation/interest in school, which can boost grades (Hunt 2005).

The leading crowd theory hypothesizes that participating in activities outside of class raises one's status and creates bonds with teachers and therefore enhances academic performance (Hunt 2005). Sports participation in particular has been linked to higher student GPA's, higher attendance records, and fewer disciplinary actions (Miller, Melnick, Barnes, Farrell, and Sabo 2005). Participation in basketball has also been found to decrease the chances of African-American male students dropping out of school (Miller et al 2005). However, more recent studies have begun to point out that good students often seek out and choose to participate in



extracurricular activities. In other words, the good grades are not a result of the extracurricular activity, but rather an indicator of whether or not a student will participate in an activity (Hunt 2005 & Miller et al 2005).

Student deviance and delinquency have been linked to academic outcomes (Murdock, Anderman, and Hodge 2000, Voelkl, Welte, and Wieczorek 1999). Deviant behavior ranges from less severe acts such as disorderly conduct in the classroom to more severe acts like committing criminal offenses (Voelkl et al 1999). Poor academic performance is often accompanied with deviant behavior. It is not clear, however, which comes first. That is, whether delinquency causes poor school performance or if poor academic achievement leads to withdrawal from school and into delinquent behavior (Voelkl et al 1999). But, low school grades are one of the strongest predictors of delinquent behavior (Voelkl et al 1999). Truancy has also been connected to poor grades and additional behavior problems (Voelkl et al 1999). It has also been found that students who do well in school are less likely to be deviant (Voelkl et al 1999). Lastly, deviant behavior is also linked to dropping out of school (Voelkl et al 1999).

## **2.2 School Environment**

A student's educational outcome and academic success is greatly influenced by the type of school that they attend. School factors include school structure, school composition, and school climate. The school one attends is the institutional environment that sets the parameters of a students' learning experience. Depending on the environment a school can either open or close the doors that lead to academic achievement.

Crosnoe, Johnson, and Elder (2004b) suggested that school sector (public or private) and class size are two important structural components of schools. Private schools tend to have both better funding and smaller class sizes than public schools (Crosnoe et al 2004b). The additional

funding of private schools leads to better academic performance and more access to resources such as computers, which have been shown to enhance academic achievement (Crosnoe et al 2004b, Eamon 2005). Smaller class sizes create more intimate settings and therefore can increase teacher-student bonding which has also been shown to have a positive affect on student success (Crosnoe et al 2004b). The relative social class of a student body also affects academic achievement (Eamon 2005). Students from low socioeconomic backgrounds who attend poorly funded schools do not perform as well as students from higher social classes (Eamon 2005).

School composition or the general makeup of a school is another important factor regarding academic achievement (Crosnoe et al 2004, Bali and Alvarez 2004, Eamon 2005). The racial make-up of a schools' student body has been shown to influence test scores and students' attachment to their school (Crosnoe et al 2004, Bali and Alvarez 2004). Student test scores and school attachment increase when a students' own race matches the most common race of their schools' student body (Crosnoe et al 2004, Bali and Alvarez 2004). This is especially true for minority students. Bali and Alvarez (2004) found that higher than average test scores at a poor California school district could be attributed to the fact that the schools' Black and Hispanic population was higher than the state's total population of those groups. Research on the influence that the race of teachers and other school faculty has on student achievement has produced mixed results. But, there is still a considerable amount of evidence linking the race of teachers to student performance (Crosnoe 2004, Bali and Alvarez 2003). Teacher diversity affects non-minority and minority students differently. For non-minority students, teacher diversity can hinder or have no effect on their academic performance (Bali and Alvarez 2003). However, a larger amount of minority teachers has been shown to positively affect the test scores and school attachment of minority students (Crosnoe et al 2004). The skill level of

teachers is another indicator of student performance. Students who attend schools with a high number of fully credentialed teachers perform better (Bali and Alvarez 2003).

Crosnoe et al defines school climate as “the general atmosphere of a school” (2004). School climate is closely related to the interpersonal relations between students and teachers. Trust between students and teachers increases if a school encourages teamwork. Research shows that students who trust their teachers are more motivated and as a result perform better in school (Crosnoe et al 2004, Eamon 2005). School policies and programs often dictate school climate. Therefore, minority students benefit more from school policies if the administrators and teachers, who help create the policies, are representative of minorities (Bali and Alvarez 2004). Students can focus more clearly when a school is able to create an environment where students feel safe. If a school is able to accomplish a feeling of safety students can have success despite their family or neighborhood backgrounds (Crosnoe et al 2004).

### **2.3 Family Background**

Family background is key to a students’ life and outside of school, is the most important influence on student learning and includes factors such as socioeconomic status, two-parent versus single-parent households, divorce, parenting practices and aspirations, maternal characteristics, family size, and neighborhood (Majoribanks 1996). The environment at home is a primary socialization agent and influences a child’s interest in school and aspirations for the future.

The socio-economic status (SES) of a child is most commonly determined by combining parents’ educational level, occupational status, and income level (Jeynes 2002). Studies have repeatedly found that SES affects student outcomes (Baharudin and Luster 1998, Jeynes 2002, Eamon 2005, Majoribanks 1996, Hochschild 2003, McNeal 2001, Seyfried 1998). Students

who have a low SES earn lower test scores and are more likely to drop out of school (Eamon 2005, Hochschild 2003). Low SES students have been found to score about ten percent lower on the National Assessment of Educational Programs than higher SES students (Seyfried 1998). SES has also been shown to override other educational influences such as parental involvement (McNeal 2001). It is believed that low SES negatively affects academic achievement because low SES prevents access to vital resources and creates additional stress at home (Eamon 2005, Majoribanks 1996, Jeynes 2002). The economic hardships that are caused by low SES lead to disruptions in parenting, an increasing amount of family conflicts, and an increased likelihood of depression in parents and single-parent households (Eamon 2005). For these reasons SES is closely tied to home environment and one could argue that SES dictates the quality of home life for children.

Previous research has shown that children from single-parent households do not perform as well in school as children from two-parent households (Majoribanks 1996). There are several different explanations for this achievement gap. Single-parent households have less income and there is a lack of support for the single-parent which increases stress and conflicts (Majoribanks 1996). Single parents often struggle with time-management issues due to balancing many different areas of life on their own. Some research has also shown that single-parents are less involved with their children and therefore give less encouragement and have lower expectations of their children than two-parent households (Majoribanks 1996).

Divorce has also been found to negatively affect academic achievement (Jeynes 2002). William Jeynes (2002) found that students whose parents had divorced were among those who scored lowest on standardized test. Possible explanations for this relationship are that divorce

can cause a family's SES level to decrease and parental connections are harmed (Jeynes 2002, Majoribanks 1996).

Research shows that supportive and attentive parenting practices positively affect academic achievement (Eamon 2005). In addition, high parent aspirations have been associated with increasing students' interest in education (Majoribanks 2005). The effect of parental involvement in their children's school has on academic achievement is less clear (Domina 2005). Parental involvement in school has been linked to both positive and negative influences on academic achievement (Domina 2005, McNeal 2001). Explanations for this discrepancy are not conclusive. It is thought that the type of involvement may make a difference and that in some cases parents become involved after their child has already had academic difficulties (Domina 2005, McNeal 2001). Other recent research has found more conclusively that while parental involvement may not help academic scores, it does help prevent behavioral problems (Domina 2005).

Maternal characteristics are another key factor that affect academic achievement (Baharudin and Luster 1998, Eamon 2005, Majoribanks 1996). Mothers who are more educated and have higher self-esteem have children who receive higher test scores (Baharudin and Luster 1998, Eamon 2005). Also, mothers who delay childbearing have been shown to provide more "cognitively stimulating" and supportive environments at home which has a positive affect on school performance (Eamon 2005).

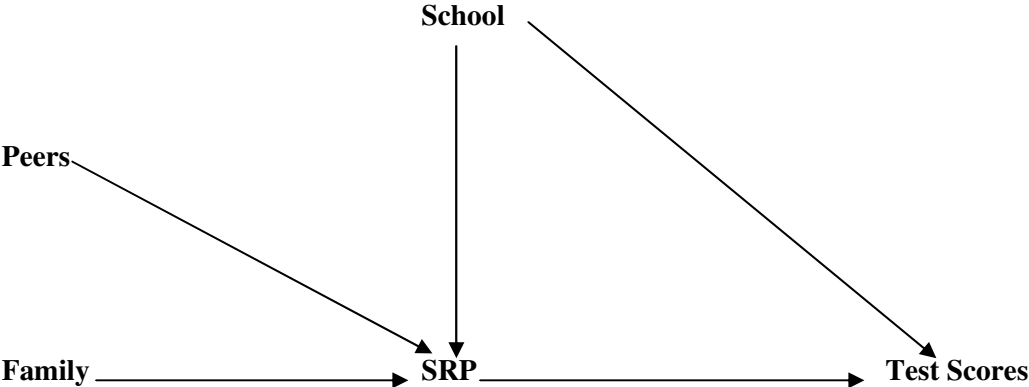
Smaller family size has been linked with higher academic achievement (Eamon 2005, Majoribanks 1996). Students with fewer siblings are likely to receive more parental attention and have more access to resources than children from large families. The additional attention and support leads to better school performance (Eamon 2005, Majoribanks 1996).

Adolescents who live in higher quality neighborhoods typically perform better in school than those who live in poorer neighborhoods (Eamon 2005). Poorer neighborhoods often lack positive role models, adult supervision, and connections to good schools (Eamon 2005). That kind of environment often prevents students from creating healthy social networks and leads to a lack of motivation which negatively affects academic performance (Eamon 2005).

### 2.4 Peer Influences

Peer groups are an important socialization agent. Participating in peer group activities is a primary stage of development and adolescents' identities are often closely associated with that of their peers (Santor et al 2000). Because peer groups are a key part of the developmental process they can have a negative affect on young people due to peer pressure and peer conformity. Higher degrees of peer pressure, which is the pressure from others to participate in certain activities, and peer conformity which is, the degree to which an individual adopts actions that are sanctioned by their peer group, have been shown to increase the likelihood of risk-taking behaviors such as substance abuse and sexual activity (Santor et al, 2000). These risk-taking behaviors indirectly affect school performance in a negative way (Santor et al, 2000).

### 2.5 Alternative Model and Hypotheses



(adapted from Wright 2006)

This study proposes a holistic alternative model that combines student role performance, school, family, and peer effects on student test scores. Student Role Performance (SRP) is a set of behavioral attributes and personal characteristics that affect how well a student performs in school. Some examples of SRP include sex, race, disability, deviance, effort, and participation in extra-curricular activities. It is expected that the higher a students' SRP, the higher a students' test scores will be. School is the institutional environment that sets the parameters of a students' learning environment. School size, student-teacher relationships, and school funding are a few examples of important school factors. Schools can have a direct affect on test scores. For example, the teacher to student ratio effects all students directly. Schools can also have an indirect affect on test scores. For example, only some students at a particular school might take college preparatory classes and that will most likely increase their student role performance, which will indirectly affect test scores. It is expected that students' test scores will increase as the quality of the school increases. Family provides connections to the resources that are needed to be a successful student. Socioeconomic status (SES), family size, and parental involvement all influence the amount of available resources. This study predicts that as SES increases so will student test scores. The peer group of an adolescent helps develop the social bonds and personal identities of an individual. Individuals' often engage in similar activities to that of their peers. Therefore it is predicted that the more an adolescents' friends participate in risk taking behavior the lower their test scores will be since risk taking behavior has an indirect effect on school performance.

### **3. Data and Methodology**

#### **3.1 Data Used**

Data for this study comes from the 2002 Educational Longitudinal Study (ELS: 2002). The ELS: 2002 was compiled by the National Center for Education Statistics (NCES), which is a part of the Institute of Education Sciences, U.S. Department of Education.

The universe of this dataset consisted of 1,221 public, Catholic, and other private schools. The sampling technique was a national probability sample of 752 public, private, and Catholic schools during the spring term of the 2001-02 school year. There was a two-step selection process. The schools were selected and then approximately twenty-six tenth graders were randomly selected per school (private schools and Asian students were over-sampled). From this there were 17,591 eligible students and 15,362 completed the base year survey.

Additionally, 13,488 parents, 7,135 teachers, 743 principals, and 718 librarians completed the base year survey. The restrictions for this study include selecting only student, parent, and administrators who completed questionnaires and only students with completed base year test score statuses. The final sample size is 7,976 students, teachers, principals, and librarians.

The ELS: 2002 is a national probability study that provides a weight variable. This weight variable can be problematic because it increases the sample size and therefore can create false significance levels during data analysis. In order to adjust for these problems a relative weight was created by dividing the weight by its' mean. The relative weight maintains the original sample size but generates the distribution of the weighted sample size.



## **3.2 Variables**

### **3.2.1 Dependent Variable**

The dependent variable is a standardized test composite score in math and reading which was administered by the NCES. This score is used as an indicator of academic achievement. It is an interval level variable with a normal distribution that ranges from 23.37 to 81.04. A quintile, quartile, and centile of the dependent variable were also created.

### **3.2.2 Independent variables**

#### **3.2.2.1 Student Role Performance Variables**

The variables used to measure student role performance included students' past academic status, student disability, student incidents of deviant behavior, and academic honors. An index was created to measure students past academic status. The index is comprised of binaries that measure: 'student ever in a remedial English class', 'student ever in remedial math class', 'student ever in dropout prevention program', and 'student ever in special education program'. The summated index was then converted into a binary (0,1) where 0 is 'good academic status' and 1 is 'poor academic status'. It is expected that students with poor academic status will have lower test scores than those with good academic status.

An index was also created to measure student disability. The index is comprised of binaries that measure: speech/language impairments, mental retardation, emotional disturbance, hearing impairments, orthopedic impairments, visual impairments, and other disability. The summated index was converted into a binary (0,1) where 0 indicates 'no disability' and 1 indicates 'disability'. It is expected that students with a disability will have lower test scores than those without a disability.

Student deviance was measured by combining seven deviance variables into an index. The original ordinal variables measured the frequency of which a student cut or skipped class, was absent from school, got into trouble, was suspended, put on probation, and times transferred for disciplinary reasons. Because these were ordinal-level variables with ranges such as ‘1 to 3 times’ the variables were recoded into midpoints and then combined to create an index of deviant acts ranging from 0 to 10 incidents. It is predicted that students who commit more deviant acts will have lower test scores than those with less deviant behavior.

An index was created to measure academic honors. The binary variables, ‘won an academic honor’, ‘recognized for good attendance’, ‘recognized for good grades’, and ‘won a community service award’ were combined to create this index. The summated index was converted to a binary where 0 indicates ‘student received no academic honor’ and 1 indicates ‘student received academic honor’. It is expected that students with academic honors will have higher test scores than those students without honors.

### **3.2.2.2 Family Level Variables**

The variables used to examine family level factors included number of siblings, socioeconomic status, family resources, and parental involvement with students’ school. An interval level variable measures number of siblings. It is expected that students with a higher number of siblings will have lower test scores than students with fewer siblings.

The variable used to measure socioeconomic status, which is a composite of parents’ education, occupational status, and income, was recoded so that all values would fall within a 0 to 100 range. It is predicted that students with higher socioeconomic status will have higher test scores than those with lower socioeconomic status.

An index was created to measure family resources. The index is comprised of binaries that measure whether or not a family has: a daily newspaper, a regularly received magazine, a computer, access to the internet, a dvd player, an electric dishwasher, clothes dryer, more than 50 books, child has own bedroom, and a fax machine. Therefore, there is an index of family resources ranging from 0 to 10. It is expected that students with a higher number of family resources will have higher test scores than students with fewer resources.

A scale was created to measure parental involvement at school. The five binary variables, 'belong to parent-teacher organization', 'attend parent-teacher organization meetings', 'take part in parent-teacher organization activities', 'act as a volunteer at the school', and 'belong to other organization with parents from school' were combined. The Cronbach alpha was .705. It is expected that student test scores will increase as parental involvement increases.

### **3.2.2.3 Peer Level Variables**

The variables used to measure peer influences included friends' emphasis on grades, friends' emphasis on positive activities, and number of friends who have dropped out of school.

An index was created to measure friends' emphasis on grades. The index is comprised of three separate interval level variables that measure, 'importance of grades to 1<sup>st</sup> friend', importance of grades to 2<sup>nd</sup> friend', and importance of grades to 3<sup>rd</sup> friend'. It is expected that test scores will be higher for students whose friends place a high importance on grades.

An index was also created to measure the importance of positive activities of peers. The index is comprised of the variables measuring the importance of: attending class regularly, studying, playing sports, getting good grades, finishing high school, continuing education after high school, doing community work, and the importance of making money. It is expected that student test scores will increase as their friends' emphasis on positive activities increases.

The interval level variable measuring the number of friends who have dropped out of school was provided in the original dataset. It is included because it is expected that students with a lower number of friends who have dropped out of school will have higher test scores.

#### **3.2.2.4 School Level Variables**

The variables used to measure school factors included percentage of students in a free lunch program, students' opinion of school environment, and school hindrances. A variable measuring the percentage of students in a free lunch program was used to determine the relative social class of a school. It is expected that schools with a high percentage of students receiving free lunch will have lower test scores.

An index was created to measure students' opinions about their school environment. The index is comprised of four binary variables that measure if the students agree or disagree with the statements, 'the teaching is good', 'teachers are interested in students', 'teachers praise effort', and the variable 'in class often feels put down by teachers' which was reversed to fit the measurement of the other two variables in the binary. It is expected that schools with students who have positive feelings toward the school will have higher test scores.

A scale was created to measure school hindrances. The scale is comprised of variables that measure the degree to which a school is hindered by: poor condition of buildings, poor heating/air/light, poor science labs, poor fine arts facilities, lack of space, poor library, lack of supplies, too few computers, lack of multi-media, lack of discipline/safety, and poor vo-tech equipment and facilities. The Cronbach alpha was .942. It is expected that schools with more hindrances will have lower test scores.

### **3.3 Method of Analysis**

For univariate analysis descriptives of the full sample and socioeconomic status of low, mid, and high groups were performed. The descriptive factors included means and standard deviations. For bivariate analysis an ANOVA was run on all factors across the low, mid, and high socioeconomic groups for each model set.

An Ordinary Least Squares (OLS) regression was performed on the full sample and used for identification of significant factors. A partitioning of variance was performed for the saturated model and the percent of the change in R-squared is recorded for each SES group.

#### **3.3.4 Hypotheses**

##### **A. Student Role Performance**

1. Net of other factors, students with poor past academic status will have lower test scores than those students with good past academic status.
2. Net of other factors, students with high expectations will have higher test scores than those with low expectations.

##### **B. School Factors**

3. Net of other factors, schools with a high percentage of students receiving free lunch will have lower test scores.
4. Net of other factors, schools with administrators that view the school positively will have higher test scores than those with administrators that view the school negatively.

##### **C. Family Factors**

5. Net of other factors, students from families with lower socio-economic status will have lower test scores.

6. Net of other factors, students whose parents are more involved in their daily life will have higher test scores.

#### D. Peer Factors

7. Net of other factors, students whose friends engage in negative activities will have lower test scores.

8. Net of other factors, students who have more friends that have dropped out of school will have lower test scores.

## 4 Results

### 4.1 Univariate and Bivariate Results

4.1.1 The univariate and bivariate results for the entire sample and by socio-economic status are shown in Table 1. For the dependent variable, test scores, the mean of the full sample (n=7,976) was 52.39. In order to determine the differences among socio-economic status the full sample was split into three categories: low (the lower 33<sup>rd</sup> percentile n=2,263), mid (the middle 33<sup>rd</sup> percentile n=2,695), and high (the highest 33<sup>rd</sup> percentile n=2,838). The lowest SES percentile group had a mean at 47.23, the mid SES group had a mean of 51.85, and the high SES group had a mean of 57.

Among the Student Role Performance factors there were significant differences between SRP and SES. In the low SES group there were more minorities (low=42.84%, mid=24.94%, high=15.70%), a higher percent of those with poor academic status (low=31.69%, mid=24.66%, high=20.26%), students who spend more time on media use (low=10.45, mid=9.96, high=8.90), and students with more incidents of deviant acts (low=1.40, mid=1.31, high=1.08). Individuals from the low SES group worked more hours on the weekend (low=6.99, mid=6.49, high=5.64) and were more likely to have English as a second language (low=26.10%, mid=13.29%, and

high=10.47%). The low SES group has a higher percentage of students with disabilities than the high SES group (6.96% versus 4.15%). There is a statistical difference of those with disabilities between the mid SES group and high SES group (5.8% versus 4.15%). Students in the high SES group spend more hours per week on homework than those in the low SES group (11.72 versus 9.72) and more hours than those in the mid SES group (11.72 versus 10.09). Students from the high SES group have more honors (high=71.93%, mid=62.72%, low=54.34%), spend more time on extra-curricular activities (high=6.35, mid=5.03, low=3.54), and more likely to plan to go further with their education (high=95%, mid=85%, low=75%).

Among the family-level factors, those in the low SES group are more likely to have a higher number of siblings (low=2.6, mid=2.3, high=2.0). Those from the high SES group have more family resources (high=8.45, mid=7.69, low=6.39), engage in more family discussions (high=2.14, mid=2.01, low=1.90), participate in family activities (high=.60, mid=.50, low=.44), and have more family rules (high=2.83, mid=2.79, low=2.64).

Among the peer factors, the low SES group has a slightly lower occurrence of negative activities by peers than the mid SES group (2.13 versus 2.18) and the high SES group (2.13 versus 2.18). The low SES group also has more peers who have dropped out of school (low=1.32, mid=1.21, high=1.13). The high SES group has a higher occurrence of positive activities of peers (high=2.32, mid=2.28, low=2.23).

Among the school factors, those in the high SES group are more likely to be in a college prep program (high=67.65, mid=59.35, low=52.04), and more likely to have a school administration that has a positive view of the school (high=.78, mid=.75, low=.72). Schools in the low SES group have more students in free lunch programs (low=31.19, mid=22.39, high=15.86) and are more likely to attend a school where students feel distracted (low=7.70%,

mid=5.83%, and high=4.20%). Students from the high SES group have higher opinions of their school than those in the low SES group (3.09 versus 2.89) and higher than those in the mid SES group (3.09 versus 2.92). Schools in the low SES group have more hindrances than those in the mid SES group (1.87 versus 1.78) and more than those in the high SES group (1.87 versus 1.74).

## **4.2 Multivariate**

Table 2 provides results from the Ordinary Least Squares (OLS) regression analysis regressing the four model sections of the alternative model on student test scores. The adjusted R-squared for the full sample is .491 (significant at the .000 level), which suggests that the model explains 49% of the variance in student test scores. The separate analysis by SES also reports statistically significant R-squared values of .39 (39%) for low SES, .40 (40%) for mid SES, and .39 (39%) for the high SES group. As shown in the full sample results, SES, net of other factors is at the .000 significance level and is the strongest predictor of test scores (.224). Test scores rise by .118 points as SES rises. This finding supports hypothesis 3: Students from families with lower socioeconomic status will have lower test scores.

The findings for the SRP factors are consistent with the previous literature in that minority status, disability, deviance, and student language (non-English) all have a negative affect on test scores. The unstandardized betas in the full sample show that minority students scored 3.209 points less than non-minority students, students with a disability scored 3.529 points less than students without a disability, student test scores also decreased by .175 points as the number of deviant acts increase, and students who do not have English as a first language scored 1.988 points less than students with English as their first language. Spending more time on homework increased test scores by .092 points, and participating in extra-curricular activities increased test



scores by .082 points. Support was also found for the SRP hypotheses. Hypothesis 1 stated: students with poor past academic status will have lower test scores than those students with good past academic status. The unstandardized beta for the full sample on past academic status shows that students with poor past academic standing scored 3.210 points less than those with good academic standing. In support of hypothesis 2, students with high expectations will have higher test scores than students with low expectations, it was found that students expecting to graduate from college scored 4.391 points higher than students who did expect to graduate from college.

School factors showed that school with more students in college prep programs scored .009 points higher on test scores, that schools with students who had higher opinions of the school also scored .571 points higher, and schools with students who felt less distracted scored 1.562 points higher. Surprisingly, neither school hindrances nor school problems decreased test scores, instead school hindrances increased test scores by .408 points and school problems increased test scores by .873 points. But both school factor hypotheses were supported. Hypothesis 3 stated schools with a high percentage of students receiving free lunch will have lower test scores and for the full sample a higher percentage of free lunch decreased test scores by .019. Hypothesis 4 stated schools with an administration that view the school positively will have higher test scores than those with administrations that view the school negatively and test scores did increase by 2.892 points as positive administration view increased.

The results for family-level factors are also consistent with previous literature and show that an increase in number of siblings decreased test scores by .200 points, that more family resources increased test scores by .141 points, and that more family discussions between the parent and student increased test scores by .681 points. An increase in family rules, a part of

parenting practices that are thought to indicate involvement, had a negative affect, decreasing test scores by .821. This could be because more rules are put in place for students who already do not do well in school. Hypothesis 4, students whose parents are more involved in their daily life will have higher test scores, was supported. Participating in family activities increased test scores by 1.647 points.

The results for peer factors were somewhat inconsistent. Participating in positive activities with peers decreased test scores by 2.419 points. But both of the peer factor hypotheses were also supported. Hypothesis 5 stated, students whose friends engage in negative activities will have lower test scores, and the results show that for the full sample negative activities of peers decreased test scores by .968 points. Hypothesis 6 stated, students who have more friends that have dropped out of school will have lower test scores, and the results also that an increase in the number of friends who have dropped out of school decreases test scores by 1.233 points.

Comparing hypothesis 1 across the SES groups, the unstandardized figures indicate that for students with poor academic status test scores decrease the most for the low SES group (-3.938), second for the mid SES group (-3.226) and least for the high SES group (-2.350). For hypothesis 2 test scores for students who expect to graduate from college increase the most for the high SES group (5.648), second for the mid SES group (5.298), and least for the low SES group (3.715). For hypothesis 3 the increase in number of students receiving free lunch decreased the test scores for the mid SES group the most (-.032), second for the high SES group (-.024), and is not significant for the low SES group. For hypothesis 4 an increase in positive administrative views of a school increases test scores the most for the high SES group (3.792), second for the mid SES group (3.004), and least for the low SES group (2.847). For hypothesis 6 test scores for those whose families participate in family activities actually decreased for the

low SES group (-.672), but increased for the mid SES group (1.747), and also increased for the high SES group (2.206). Test scores decreased across all group for hypothesis 7, the negative activities of peers decreased the test scores the most for the high SES group (-1.374), second for the mid SES group (-.799), and least for the low SES group (-.556). For hypothesis 8, the number of friends who have dropped out of school decreased the test scores the most for the low SES group (-1.409), second for the high SES group (-1.391), and least for the high SES group (-1.067).

Figure 1 shows the results of the partitioning of unique variance in test scores by model segment. In order to determine the unique variance all of the variables in each model segment were first standardized which establishes the same metric for each variable. Each model segment was then summated and regressed upon test scores. The resulting semi-partial correlation coefficients provided the unique contribution of variance in the dependent variable, test scores. The percentage of variance for each model segment is displayed on the models in Figure 1. The top model shows that family factors account for the largest amount in the variance on test scores at 62%, while SRP factors account for 19%, peer factors for 14%, and school factors for 5%. In the bottom model SES has been pulled out to show its' large impact on school achievement. SES accounts for 52% of the variance in test scores. Figure 2 provides a graph displaying test scores by SES. As shown in the graph test scores rise steadily as SES rises.

## **5. Discussion**

Support was found for all of the eight of hypotheses in this study. Regarding the Student Role Performance model segment students with poor past academic status did have lower test scores. Additionally, students who have higher expectations had higher test scores. This

finding correlates with previous research that found that students who invest more in school do better (Battle and Lewis 2002) and that students who exude more effort also perform better (Carbonaro 2005).

Within the family-level model segment significant support was found for the hypothesis that students from low socioeconomic status will have lower test scores. In fact, OLS regression revealed that socioeconomic status had the greatest impact on test scores in relation to the other variables of this study. This is supported by to the many previous studies that have found that socioeconomic status affects student outcomes (Baharudin and Luster 1998, Jeynes 2002, Eamon 2005, Majoribanks 1996, Hochschild 2003, McNeal 2001, Seyfried 1998). Low socioeconomic status prevents access to resources and leads to additional stress and conflicts at home that affect all aspects of a child's life including academic achievement (Eamon 2005). This study also found that an increase in family activities such as parents attending school activities, spending time talking with their children, going on vacations, and participating in fun activities, increases test scores. This finding supports previous literature that found that supportive and attentive parenting practices positively affect academic achievement (Eamon 2005).

Support was found for both of the peer-level hypotheses. First, students whose friends engaged in negative activities had lower test scores. Second, students who had more friends that had dropped out of school had lower test scores. These findings support previous research that suggests that risk-taking behaviors of friends indirectly affect student outcomes (Santor et al 2000).

Lastly, support was also found for both of the school-level hypotheses. Schools with a high percentage of students receiving free lunch had lower test scores. The amount of students

receiving free lunch is an indicator of the relative social class of a student body which has been found to affect academic achievement (Eamon 2005). Schools with administrations that view the school positively had higher test scores. This is supportive of previous research that found that positive school climate results in students performing better (Crosnoe et al 2004, Eamon 2005).

## **5.2 Limitations**

The limitations of this study deal mainly with the cross-sectional nature of the data. This data was obtained at one point in time therefore it is difficult to determine how long an individual has been at a certain SES level. For example, an individual may have recently experienced a shift in their economic standing due to parents' divorce or other circumstances. In that case the full effects of the new SES standing may not have set in by the time of the survey. Additionally, this study uses a single test composite score as the dependent variable. A full academic history might have provided better results.

Insufficient information on certain variables was another limitation. For example, due to privacy laws, the ELS:2002 is not able to ask students about drug and alcohol use or sexual activity involving the student or their peers. If this information was available the peer-level factors might have a larger impact and become more clear-cut. There is also a lack of information regarding neighborhood factors and this survey does not gather information about the wealth of families which are important factors.

## **5.3 Implications**

This study along with numerous others has found that socioeconomic status and access to resources are extremely important factors that influence student achievement (Baharudin and Luster 1998, Jeynes 2002, Eamon 2005, Majoribanks 1996, Hochschild 2003, McNeal 2001,

Seyfried 1998). When access to resources both within the family and school are limited students suffer and lag behind in their academic achievement. This information appears to be an important aspect that No Child Left Behind (NCLB) overlooks. The NCLB requires schools to show Adequate Yearly Progress (AYP) in their test scores (Arce et al 2005). If this is not done a school is termed “failing” and funding is cut (Arce et al 2005). It is very difficult for schools that already consist of disadvantaged students to reach the NCLB requirements and, as a result, students from these schools will likely have their limited resources cut further. This study provides statistical support for the growing criticism of the NCLB (Arce et al 2005). If research regarding test scores and the NCLB is furthered, more suitable policies could be suggested such as collaborative instead of punishment driven policies. However, leveling the playing field for those at an economic disadvantage is not an easy task. But there are other directions that public policy could move towards. Studies have found that quality preschools, one-on-one reading sessions, small class sizes for elementary students, and providing challenging classroom material benefit disadvantaged students (Hochschild 2003). Perhaps future public policy could identify “failing” and disadvantaged schools and establish some of the above recommendations for those schools through additional funding and resources. Providing extra funding for the poorest schools and offering incentives for quality teachers to work in disadvantaged schools could be the beginning steps for a more successful future for all students.

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## **APPENDIX**

## Appendix

### TABLE 1 Values for Full Sample and by Class

Variables:	Full Sample	Lower 33%	1 <sup>2</sup>	Middle 33%	1 <sup>2</sup>	Upper 33%	1 <sup>2</sup>
<b>Dependent Variable:</b>							
Testscore (mean):	52.39	47.23	***	51.85	*** ^	57.00	*** ^
(stddev):	(9.58)	(8.89)		(8.85)		(8.49)	
<b>Independent Variables:</b>							
<b>SRP factors:</b>							
Female (0,1)	53.0%	55%	*	51%		51%	*
	(0.50)	(0.50)		(0.50)		(0.50)	
Minority (0,1)	26.8%	42.84%	*** ^	24.94%	***	15.70%	*** ^
	(0.44)	(0.49)		(0.43)		(0.36)	
Past Academic Status (0,1)	25.10%	31.69%	***	24.66%	***	20.26%	***
	(0.43)	(0.47)		(0.43)		(0.40)	
Student has Disability (0,1)	5.54%	6.96%		5.80%	***	4.15%	***
	(0.23)	(0.25)		(0.23)		(0.20)	
Hours spent on Homework	10.58	9.72		10.09	***	11.72	*** ^
	(8.75)	(9.23)		(8.38)		(8.59)	
Hours spent on media use	9.72	10.45	*** ^	9.96	***	8.90	*** ^
	(5.19)	(5.41)		(5.20)		(4.88)	
Student has Honors (0,1)	63.64%	54.34%	*** ^	62.72%	***	71.93%	*** ^
	(0.48)	(0.50)		(0.48)		(0.45)	
Student Deviance (0-10)	1.25	1.40	***	1.31	***	1.08	*** ^
	(1.18)	(1.28)		(1.25)		(1.00)	
Extra-curricular Activities (hours)	5.08	3.54	***	5.03	*** ^	6.35	*** ^
	(5.88)	(5.30)		(5.85)		(6.05)	
Participation in Sports (0,1)	37.64%	36.03%	*	39.68%		36.98%	
	(0.48)	(0.48)		(0.49)		(0.48)	
Student Expectations (0,1)	85.00%	75.00%	*** ^	85.00%	***	95.00%	*** ^
	(0.35)	(0.44)		(0.36)		(0.23)	
Student Work Hours on Weekend	6.32	6.99	*** ^	6.49	***	5.64	*** ^
	(5.06)	(5.20)		(5.19)		(4.74)	
English is not 1st Language (0,1)	15.98%	26.10%	*** ^	13.29%	***	10.47%	***
	(0.37)	(0.44)		(0.34)		(0.31)	
<b>School Factors:</b>							
% of Students in College Prep Program	60.25	52.04	*** ^	59.35	***	67.65	*** ^
	(29.82)	(29.75)		(29.13)		(28.69)	
% in Free Lunch Program	22.57	31.19	*** ^	22.39	***	15.86	*** ^
	(21.46)	(24.49)		(20.38)		(16.98)	
Student Opinion of School	2.97	2.89		2.92	***	3.09	***
	(1.25)	(1.29)		(1.28)		(1.19)	
School Hindrances	1.79	1.87	***	1.78		1.74	***
	(0.72)	(0.74)		(0.70)		(0.71)	
Administration View of School	0.75	0.72	***	0.75	***	0.78	*** ^
	(0.14)	(0.13)		(0.13)		(0.14)	
Student less likely to be distracted (0,1)	5.78%	7.70%	***	5.83%	***	4.20%	***
	(0.23)	(0.27)		(0.23)		(0.20)	
School Problems	2.41	2.42		2.42		2.40	
	(0.38)	(0.35)		(0.36)		(0.41)	

(Continued on next page)

**TABLE 1 (continued)**  
**Values for Full Sample and by Class**

Variables:	Full Sample	Lower 33% <sup>1</sup> <sup>2</sup>	Middle 33% <sup>1</sup> <sup>2</sup>	Upper 33% <sup>1</sup> <sup>2</sup>
<b>Family-level factors:</b>				
Sibling Size	2.2 (1.48)	2.6 (1.60)	*** ^ 2.3 (1.50)	*** 2.0 (1.29)
Family Resources (0-10)	7.59 (1.89)	6.39 (2.12)	*** ^ 7.69 (1.63)	*** 8.45 (1.35)
Family Discussions (1-3)	2.02 (0.44)	1.90 (0.46)	*** ^ 2.01 (0.43)	*** 2.14 (0.40)
Family Activities (0,1)	51.86% (0.50)	44.02% (0.50)	*** 49.76% (0.50)	*** 60.12% (0.49)
Family Rules (1-4)	2.76 (0.64)	2.64 (0.68)	*** ^ 2.79 (0.63)	*** 2.83 (0.61)
<b>Peer Factors:</b>				
Negative Activities of Peers	2.17 (0.47)	2.13 (0.49)	*** 2.18 (0.47)	*** 2.18 (0.46)
Positive Activities of Peers	2.28 (0.37)	2.23 (0.40)	*** 2.28 (0.36)	*** 2.32 (0.34)
Friends who dropped out of school	1.21 (0.46)	1.32 (0.56)	*** ^ 1.21 (0.45)	*** 1.13 (0.37)
<b>Sample n (weighted):</b>	7,796	2,263	2,695	2,838
	100%	29.0%	34.6%	36.4%

<sup>1</sup> = \*\*\* p < 0.001; \*\* p < 0.01; \* p < 0.05

<sup>2</sup> effect size greater = > .20

**TABLE 2**  
**OLS Regression for SES**

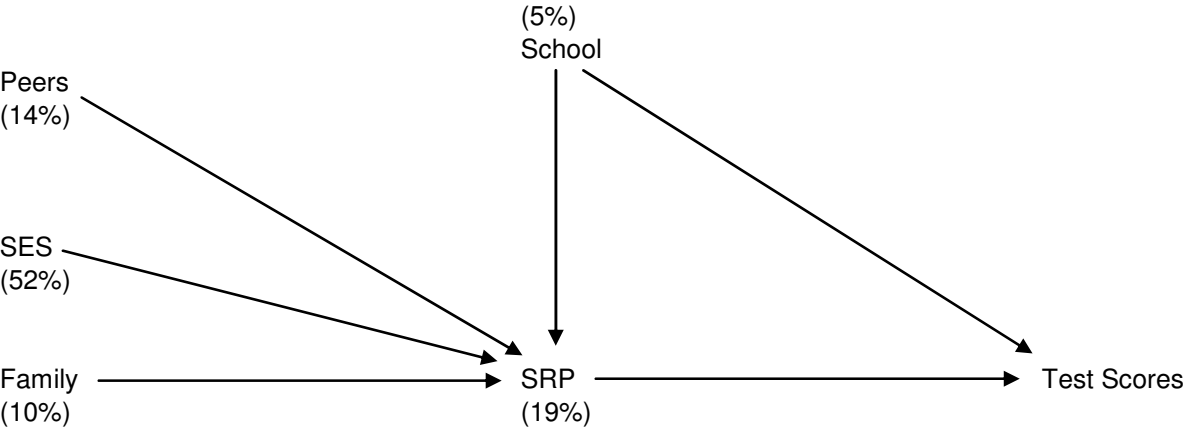
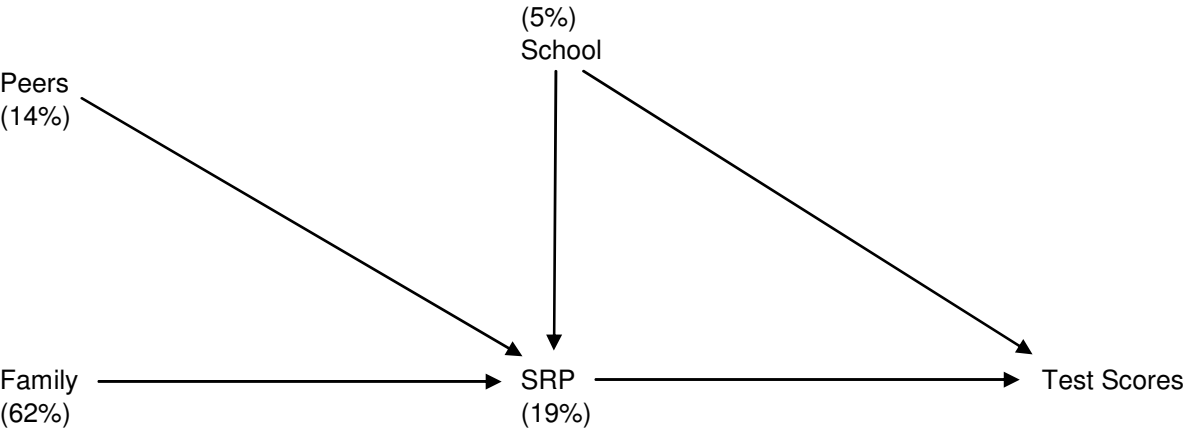
Variables:	Full Sample		Lower 33%		Middle 33%		Upper 33%	
	unstd.	std.	unstd.	std.	unstd.	std.	unstd.	std.
<b>SRP factors:</b>								
Female (0,1)	-2.226 ***	-0.116	-2.036 ***	-0.114	-1.795 ***	-0.101 <>	-2.795 ***	-0.165
Minority (0,1)	-3.209 ***	-0.148	-3.315 ***	-0.185	-3.854 ***	-0.189	-2.670 ***	-0.11
Past Academic Status (0,1)	-3.210 ***	-0.145	-3.928 ***	-0.206	-3.226 ***	-0.157	-2.350 ***	-0.111 <>
Student has Disability (0,1)	-3.529 ***	-0.084	-3.059 ***	-0.088	-2.722 ***	-0.072 <>	-5.072 ***	-0.119 <>
Hours spent on Homework	0.092 ***	0.084	0.075 ***	0.078	0.081 ***	0.077	0.117 ***	0.118
Hours spent on media use	-0.145 ***	-0.078	-0.079 **	-0.048	-0.127 ***	-0.074 <>	-0.228 ***	-0.13 <>
Student has Honors (0,1)	2.466 ***	0.124	1.998 ***	0.112	2.351 ***	0.129	3.195 ***	0.169 <>
Student Deviance	-0.175 *	-0.022	-0.207	-0.030	-0.070	-0.010	-0.332 *	-0.039
Extra-curricular Activities (hours)	0.082 ***	0.051	0.110 ***	0.066	0.133 ***	0.088 <>	0.040	0.029
Participation in Sports (0,1)	-2.514 ***	-0.127	-2.556 ***	-0.138	-2.371 ***	-0.131	-2.543 ***	-0.145
Student Expectations (0,1)	4.391 ***	0.162	3.715 ***	0.182 <>	5.289 ***	0.215	5.648 ***	0.151 <>
Student Work Hours on Weekend	-0.075 ***	-0.040	-0.050	-0.029	-0.066 **	-0.039	-0.126 ***	-0.070
English is not 1st Language (0,1)	-1.988 ***	-0.076	-2.567 ***	-0.127	-1.944 ***	-0.075	-1.878 ***	-0.068
<b>School Factors:</b>								
% in College Prep Program	0.009 **	0.028	0.005	0.018	0.012 *	0.038	0.013 **	0.042
% in Free Lunch Program	-0.019 ***	-0.042	-0.011	-0.031	-0.032 ***	-0.073	-0.024 **	-0.048
Student Opinion of School	0.571 ***	0.075	0.484 ***	0.070	0.655 ***	0.095	0.546 ***	0.076
School Hindrances	0.408 **	0.031	0.087	0.007	0.542 *	0.043	0.621 **	0.052
Administration View of School	2.892 ***	0.041	2.847 *	0.043	3.004 *	0.045	3.792 **	0.061
Student Distraction (0,1)	1.562 ***	0.038	1.685 **	0.051	1.730 **	0.046	0.957	0.023
School Problems	0.873 ***	0.034	0.271	0.011	0.898 *	0.036	1.330 ***	0.064
<b>Family-level factors:</b>								
ses	0.118 ***	0.224						
Sibling Size	-0.200 ***	-0.031	0.192 **	-0.045	-0.217 *	-0.037	-0.262 **	-0.040
Family Resources (0-10)	0.141 **	0.028	0.886 **	0.046	0.124	0.023	0.485 ***	0.077 <>
Family Discussions (1-3)	0.681 ***	0.031	1.069 *	0.046	0.608	0.030	0.515	0.024
Family Activities (0,1)	1.647 ***	0.086	-0.672 ***	0.060	1.747 ***	0.099	2.206 ***	0.127 <>
Family Rules (1-4)	-0.821 ***	-0.055	-0.712 **	-0.052	-0.659 **	-0.047	-0.976 ***	-0.070
<b>Peer Factors:</b>								
Negative Activities of Peers	-0.968 ***	-0.048	-0.556	-0.030	-0.799 **	-0.042	-1.374 ***	-0.074
Positive Activities of Peers	-2.419 ***	-0.093	-1.729 ***	-0.078 <>	-3.560 ***	-0.146 <>	-2.161 ***	-0.086
# of Friends who dropped out of School	-1.233 ***	-0.060	-1.409 ***	-0.089	-1.067 ***	-0.054	-1.391 ***	-0.060
<b>Constant:</b>	46.070		46.327		44.553		42.430	
<b>Adjusted R-sq.:</b>	0.491		0.385		0.401		0.390	
<b>Sample n (weighted):</b>	7,796		2,263		2,695		2,838	

<sup>1</sup> = \*\*\* p < 0.001; \*\* p < 0.01; \* p < 0.05

<sup>2</sup> effect size greater = > .20

**Figure 1**

Partitioning of Unique Variance in Test Scores by Model Segment



**Figure 2**  
**Test Scores by SES (Deciles)**

