

**2008 AIR RESEARCH GRANT PROPOSAL**

**Title:** The Effect High School Social Compositions on Student Educational Attainment:  
High School Graduation, College Matriculation, and College Persistence

**Data sets of interest:** Educational Longitudinal Study (ELS:2002)

**Grant Amount Requested:** \$40,000

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## **Project Summary**

The proposed study will use data from the recently released Educational Longitudinal Study (ELS) base year through second follow-up to examine the effects of high school SES composition on student educational attainment. The general hypothesis is that attending a low SES composition high school has a negative impact on educational attainment above and beyond the impact of the students' own family and academic background. Data from approximately 10,500 students attending 580 public high schools will be analyzed to model the mechanisms through which socioeconomic composition impacts educational attainment at three critical stages: graduation from high school, matriculation to college, and persistence in college two years after their expected graduation date (2006). An innovative design is used to examine these sequential transitions during the two-year period after which students were expected to graduate from high school (Vegas, Murnane, & Willett, 2001). ELS is an excellent data source for addressing the research questions posed in this study because it is very new, nationally representative, has a large sample of schools which is necessary for modeling school effects, has a large number of student and school variables, and is longitudinal which is necessary for modeling the attainment transitions that take place over time.

Multilevel structural equation modeling will be employed to address the research problem (Muthen, 1989, 1994) which has the same advantages over standard multilevel models as SEM has over multiple regression—namely that errors in the measurement of variables can be contained, that latent variables can easily be included, and that causal pathways between variables can easily be modeled. The multilevel SEM is ideally suited for estimating the direct and indirect pathways of the theoretical models hypothesized in the proposed study. For each of the four research questions posed above, a series of models will be estimated on the corresponding outcome.

A “step-up” strategy is used to address the research questions. This strategy involves beginning with simpler models and adding variables in sets that are both cohesive and theoretically informed. Following the common practice in multilevel modeling, the first model is the unconditional model, which contains no independent variables. This model provides a sense of the amount of variability that is between schools on the attainment outcome. The second model is the student model, which controls for student inputs across schools and provides a baseline for estimating school effects. The third model examines the association between SES composition and the educational attainment outcome with no other school-level variables in the model. This

model provides an estimate of the *total* effect of SES composition on attainment. The fourth model includes the four school-level latent constructs as specified in Figure 1. This model provides estimates of the direct and indirect effects of SES composition on attainment. Finally, in addition to the four latent constructs, the fifth model will also include measures of school recourses, structures, process and practices, to determine the degree that these school effects moderate the impact of SES composition on attainment.

The notion that schools could be separate but equal—segregated along racial or social class lines—was rejected when the U.S. Supreme Court ruled in favor of Brown in the history lawsuit against the Board. However, recent evidence shows that schools have become more highly segregated in the past 15 years (Orfield, 2005). The results of the proposed study will have important policy ramifications because it will provide evidence of how school-based social segregation results in inequality of educational opportunity for members of some sectors of society. The fact that such inequality is linked to various measures of quality of life and wellbeing makes this issue all the more policy relevant.

The results will be useful for informing educational policy makers on how to minimize the negative consequences of attending a low SES school and more generally, on how to improve equality of opportunity. If school resources and structures largely moderate the effects of SES composition on achievement gains and attainment, for instance, then equalizing schools on those characteristics may be sufficient to remedy the inequality. On the other hand, if SES composition is largely a peer effect that directly impacts educational attainment, then more drastic measures may be necessary, such as a redistribution of students to equalize SES composition across schools.

The results of the proposed study will be presented at both the AIR Forum and the AERA national conference. A minimum of two academic papers will be prepared and submitted for review in top-tier education journals. One will focus on the implications of the results to higher education and will be directed toward an audience of higher education scholars, practitioners, as well as policy makers. The other will be directed toward education researchers more generally and will cover both the sociological underpinnings of the study and the policy implications of the results. In addition to these academic manuscripts a policy brief will be produced and disseminated to various policy organizations, educational entities, and government agencies. The policy brief will not exceed 6 pages and will highlight the key findings in an accessible manner.

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## 4. Project Description

### **Statement of Problem**

Educational attainment is associated with a wealth of positive individual and societal outcomes. It is a robust predictor of positive individual life outcomes including economic prosperity, participation in society, and general health. A recent study by the U.S. Bureau of Labor Statistics estimates that individuals who hold a bachelor's degree or higher earn, on average, one million dollars more during their working lifespan compared to those with less than a bachelor's degree (Dohm & Wyatt, 2002). Similarly, educational attainment is positively associated with voter participation, taxation, indicators of healthful living (diet, exercise, smoking), and the incidence of various diseases (College Board, 2004). Conversely, the economic costs to society associated with low educational attainment are enormous. A recent study of the economic impact to the state of California estimated that each annual cohort of high school dropouts eventually—over the lifespans of its members—extracts approximately \$46 billion from the state's economy (Belfield & Levin, 2007), which is more than seven times the total annual State expenditures for the 23-campus California State University system. While the benefit to society of a public policy that firmly promotes educational attainment seems to outweigh the costs, who is actually able to reach high levels of attainment is also an important policy issue. Unfortunately, there are certain sectors of the American populace for whom low levels of educational attainment remain a harsh reality.

A recent descriptive study by the National Center for Educational Statistics illustrates this concern, finding that children from low SES families (family income LT \$20K/yr) were five times more likely to fail to earn a high school diploma compared to children from affluent families (family income GT \$100K/yr) and that African American and Latino children were twice as likely as white children to do the same (Bozick & Lauff, 2007). This attainment disparity only widens as young adults transition from high school. Upon high school graduation, 40 percent of the young adults from low SES families, 62 percent of African Americans, and 58 percent of Latinos matriculate directly into college. This is compared with a 91 percent matriculation rate among affluent families and a 75 percent rate among white children (Bozick & Lauff, 2007). And these numbers only begin to capture the full differences. For example, of those that do enter college directly from high school, young adults from affluent families are also far more likely to attend prestigious universities and far less likely to enter community colleges.

And because educational attainment is a sequential process—typically a high school diploma or equivalent is required for college enrollment—disparities at one level tend to be compounded at the next. The story these figures tell of educational attainment in America is more one of social reproduction (Bourdieu, 1977) than one of social mobility.

The personal, social, and institutional forces that together determine one’s educational attainment are complex. While an individual’s family and academic background—in addition as other factors—likely contribute to the attainment disparity, schools may also play an important role. Based on a broad array of factors, the educational milieu at schools serving primarily low SES children presents consistent barriers to learning that are not present in middle or high SES schools. For instance, schools serving primarily low SES students offer fewer advanced courses in math and science and employ lesser-qualified teachers who are confronted with more behavioral problems and classroom disruptions (Palardy, in press). Yet, the social composition of the student body at the school may matter most.

The socioeconomic composition of schools<sup>1</sup> has been recognized as an important school effect since the Coleman Report found that it had the greatest impact on student achievement of any school factor (Coleman et al., 1966). In the past few decades, an extensive body of research has been amassed that validates Coleman’s finding and extends it to include not only the impact of SES composition on student achievement, but also on students’ graduation from high school (Byrk & Driscoll, 1988; Jencks & Mayer, 1990; Murnane, 1981; Rumberger & Palardy, 2005a; Willms, 1986). SES composition has continued to draw the interest of educational researchers and policy makers out of concern that it may heighten inequity in learning environments.

In recent years, as American schools have become increasingly segregated along racial and socioeconomic lines (Orfield, 2005), the effect of SES composition has likely become more pervasive and more pronounced. Surprisingly, however, little is known about how SES composition influences educational attainment. While there is a body of literature that addresses the effect of SES composition on student learning, very little focuses on educational attainment. That is, only a handful of studies include elements examining the relationship between SES composition and high school graduation, and the central focus of those studies is high school dropout more generally

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<sup>1</sup>Socioeconomic composition (or SES composition) is the average socioeconomic status of students attending a school. In this study, socioeconomic status is measured using an equally-weighted composite of five components including mother’s and father’s educational attainment and occupational status, and family income.

(Bryk & Thum, 1989; McNeal, 1997; Rumberger & Arellano, 2007; Rumberger & Thomas, 2000; Rumberger & Palardy, 2005b). No studies could be found on the effect of SES composition on college attendance or persistence. The present study will address this gap in the research literature using a recently released and nationally representative dataset as well as innovative statistical models.

### **Theories on the Effects of Socioeconomic Composition**

Educational researchers and sociologists have posited various theories on how SES composition exerts its effect on educational outcomes. Perhaps the most widely accepted is that SES composition is a proxy measure for peer effects that directly impact student outcomes: Academic skills, educational values, and social norms are associated with SES and are transferred among students through peer interactions to influence behaviors, attitudes, and ultimately cognitive development and other educational outcomes (Dreeben & Bar, 1988). These peer effects tend to depress educational performance in low SES composition schools where students tend to have lower levels of educationally important attributes and to enhance performance in high SES composition schools where student educational attributes tend to be higher.

A second theory posits that the effect of SES composition is manifested indirectly through the inequitable distribution of resources among schools and differences in the structural characteristics of schools that tend to be correlated with SES composition and tend to undermine students' learning opportunities. For example, low SES composition schools may have inferior facilities and less qualified teachers compared to their high SES composition counterparts (Betts, Rueben, & Danenberg, 2000). This theory suggests that equalizing school resources and structures would resolve—or at least moderate—the effect of SES composition. A recent report on California schools by researchers at UCLA illustrates how this theory may work. High schools serving high percentages of underrepresented minority students from low SES families do not offer enough college preparatory courses for more than a small fraction of their students to meet the minimal course requirements to enter a public university. Moreover, the college preparatory courses that are offered are three times more likely than those at other schools to be taught by a teacher who does not hold the appropriate credential (UC/ACCORD & UC/IDEA, 2007).

A third theory hypothesizes that SES composition affects student outcomes indirectly by altering the learning climate and school processes, such as the academic press of the school. That is, the learning climate at schools is molded from the two sometimes counterbalancing forces of the SES composition and the academic press, the latter of which measures the degree to which the faculty and curriculum emphasize academics (Hatcher, 1998; Slee &

Weiner, 1998; Thrupp, 1999). In high SES composition schools where students tend to have strong academic skills, high educational aspirations, and strong motivation to learn, a robust academic press will tend to be accepted by the student body and lead to an enhanced learning climate and ultimately more favorable educational outcomes. In low SES composition schools, however, where students tend to have lesser developed academic skills, and lower educational aspirations and motivation to learn, a strong academic press will tend to meet resistance from students and may be counterproductive. In this case some level of compromise may be necessary to maximize achievement and to retain students (Harker & Tymms, 2004; Thrupp, 2001). Appendix Figure 1 illustrates how these school dynamics work to influence student attainment (as well as achievement). The model shows that attainment is the result of both individual factors (e.g., student family and academic background) as well as school factors. This conceptual model, which is discussed in greater detail later, can be used to test the hypothesis of each of the three theories outlined above.

### **Educational Attainment**

Research has identified several individual and school factors associated with educational attainment (Choy, 2002; Light & Strayer, 2000; Rumberger & Larson, 1998; Lee & Burkam, 2003). Student risk factors can be broken down into background characteristics and school behaviors. Background characteristics cover a broad array of factors—both social and academic. For example, adolescents from low socioeconomic backgrounds or from historically disadvantaged ethnic groups, those with low prior achievement, or those who have been held back a grade are at greater risk of dropping out of high school. Indicators associated with failing to complete college include beginning post-secondary studies at community college, working full-time, and having parents who did not attend college (Choy, 2002). Moreover, students were more likely to complete college if the abilities matched the selectivity of the college they attended (Light & Strayer, 2000). For example, low-ability students were significantly more likely to complete college if they attended a less demanding school and high ability students were more likely to graduate if they attended a selective school.

Discriminating student factors in terms of background characteristics and school behaviors is important because background characteristics are in place when students enter high school, while school behaviors may be the result of their background or may emerge due to their high school experiences and school environment. School behaviors are measures of students' academic and social performance at the school. Social and academic disengagement, low grades, poor attendance records, and misbehavior are examples of school behaviors that have



been linked to an increased risk of dropping out. Some research has concluded that attainment is chiefly the result of academic disengagement at school that may be the consequence of learning problems, while other research suggests that dropping out is more an issue of social engagement, which may impact academic commitment (Finn, 1989; Wehlage, Rutter, Smith, Lesko, & Fernandez., 1989). This is an important distinction because promoting social engagement may require different resources (e.g., counselors) and different policies (e.g., discipline policies) than promoting academic engagement and student learning.

The literature also identifies school-based risk factors, which can be categorized into school input factors or school processes and practices. Inputs are conceptualized as being largely beyond the control of school site personnel, while schools have control over practices (Rumberger & Thomas, 2001). School inputs include compositional effects (e.g., social and racial composition, average achievement), structural features of the school (size, urbanicity), and school resources (teacher salary, computers, quality and condition of physical structures). School processes and practices are perhaps the most important type of school factor because these are aspects of the school that school site personnel have the greatest control to change. Practices and policies may impact whether students graduate from high school and if so whether they are sufficiently prepared to enroll in and succeed at college. Processes and practices include the academic and social climate of the school, the attitudes and practices of the teachers, or the leadership characteristics of the principal. They may also include policies that facilitate involuntary dropout due to low grades, poor attendance, misbehavior, or being over age—policies that can lead to suspensions or expulsions (Bowditch, 1993; Fine, 1991; Riehl, 1999; Romo & Falbo, 1996). A recent study at UCLA found that access to a college preparatory curriculum in high school played a central role in educational attainment (UC/ACCORD & UC/IDEA, 2007). Such a curriculum not only helps raise student achievement and prepare students for rigorous college studies, but often is a requirement for admissions to universities. As with student risk factors, discriminating school risk factors by inputs and practices allows for the examination of whether school policies and practices are contributing to or ameliorating dropout risks above and beyond inputs.

### **Research Objectives**

The proposed study will use data from the recently released Educational Longitudinal Study (ELS) base year through second follow-up to examine the effects of high school SES composition on three sequential transitions associated with student educational attainment: high school graduation, matriculation into college, and persistence in college. The general hypothesis is that attending a low SES composition high school has a negative impact on

educational attainment above and beyond the impact of the students' own family and academic background. The study will examine the role that school inputs (recourses, structures) as well and school processes and practice, play in the association between SES composition and educational attainment. While there is some research evidence that SES composition does impact the likelihood of high school graduation, much of that evidence is based on NELS:88 or High School and Beyond data and is 15 or more years old. Given the educational and social changes that have occurred over that period, the degree that it is still applicable is unclear.<sup>2</sup> For students who do graduate from high school, the proposed study will examine how SES composition impacts their decision about entering college, as well as their persistence in their higher education pursuits two years later. The following general research questions will be addressed:

- 1) Controlling for various aspects of student background (academic, family, social), what is the association between SES composition and high school graduation? And do other school factors, particularly school processes, moderate that association?
- 2) For students who graduate on schedule (2004), controlling for student background characteristics, what is the association between SES composition and matriculation into college immediately after graduation? And do other school factors, particularly school processes, moderate that association?
- 3) For students who enroll in college immediately upon high school graduation, controlling for student background characteristics, what is the association between SES composition and the selectivity of the college? Do other school factors moderate that association?
- 4) For students who enroll in college immediately after high school, controlling for student background characteristics, what is the association between SES composition and persistence (continued enrollment) two years later? Do other school factors moderate that association?

## **Methods**

### **Data Source**

This study will use recently released data from the *Education Longitudinal Study* (ELS), a longitudinal survey

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<sup>2</sup> For example, the achievement gap between disadvantaged minorities and white children has been reduced and the percent of low SES children taking advanced math and science coursework in high school has more than tripled between 1982 and 2004 (Dalton et al., 2007). Black and Hispanic children are also matriculating to college at substantially higher rates in 2004 compared to 1982.

of 2002 high school sophomores collected by the National Center for Education Statistics.<sup>3</sup> The students surveyed were followed and interviewed on two-year intervals and transcript data was collected from their high school in 2005, about one year after they were scheduled to graduate. Data from approximately 10,500<sup>4</sup> students attending 580 public high schools<sup>5</sup> will be analyzed to model the mechanisms through which socioeconomic composition impacts educational attainment at three critical stages: graduation from high school, matriculation to college, and persistence in college two years after their expected graduation date (2006). Appendix Figure 2 illustrates the sampling design that will be used in this study. The first analysis, to study predictors of high school graduation, will be based on a sample of public school students who completed the survey during all three data collection waves. The second analysis, to examine predictors of college enrollment, will be based on students who were college eligible. This sample is limited to individuals who either graduated from high school or earned a GED by 2005, about 1 year after their expected graduation date.<sup>6</sup> Those who did not meet this criterion are omitted from the analysis because they are typically not eligible to enroll in college. The third analysis, to examine predictors of college persistence, will be based on 2006 data for students who entered college in 2004.<sup>7</sup> Those that did not enter college at that point are omitted because the model is designed to examine persistence in college. This sampling design was derived from a Harvard study of similar design on who becomes a teacher (Vegas, Murnane, & Willett, 2001).

For several reasons ELS is an excellent data source for addressing the research questions posed in this study. It includes an extensive number of student family and academic background variables that are necessary for statistically controlling for differences in student inputs across schools when estimating school-level effects. The longitudinal nature of the data allow for the modeling of attainment at the three critical transitions that are the focus of the proposed study. The large sample of schools provides sufficient statistical power for the examining how schools contribute to attainment. And the dataset is also very new. Indeed, the second follow-up was released in

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<sup>3</sup> See <http://nces.ed.gov/surveys/els2002/>.

<sup>4</sup> The F2-BY panel will be used. This is a longitudinal sample of students who completed the survey at the base year and second follow up. The appropriate student and school sample weights will be applied so that the results generalize to 2002 10<sup>th</sup> graders and 2002 public high schools.

<sup>5</sup> The sample is restricted to public schools because their funding, policies, and practices are largely public domain. Selective bias also confounds public-private school comparisons, which is not the focus of the proposed study.

<sup>6</sup> Transcript data will be used to determine this. A preliminary analysis suggests that 91% of the student had graduated or earned a GED by that point.

<sup>7</sup> A preliminary analysis suggests that 60% of the student sample entered college in 2004.

October of 2007, which will make the results more relevant to present-day policy issues. This last characteristic of the data is important because much of the literature on educational attainment is based on data at least 15 years old, a period during which considerable social and educational change occurred.

### **Variables**

Past research on the effects of SES composition on educational attainment has focused on high school graduation. This study uses four different outcome measures will be used to address the research questions in this study including: 1) high school graduation, 2) college enrollment, 3) college persistence two years after enrollment, and 4) college selectivity. The attainment outcomes are all dichotomous variables.

A broad array of independent variables will used. Variable selection is based on the theoretical framework outlined in Figure 1, previous research on compositional effects and educational attainment, and availability of variables in the ELS dataset. A tentative list of independent variables is provides in Appendix Table 1. While the primary focus of the study is school mechanisms that are modeled at the school level of analysis, several measures of the students' family, academic, and behavioral background are included as control variables to hold constant differences in the background characteristics of students (e.g., socioeconomic status, ethnicity, level of academic and social engagement at school, etc.) entering the schools. It is also critical to control for SES and the student level so that the SES composition variable captures the school context above and beyond the students' own individual backgrounds. At the school level of analysis, three latent constructs including Socioeconomic Composition, Learning Climate, and Academic Press, and a set of variables measuring school structures (e.g., size or urbanicity) and school resources (e.g., teacher salary, student to teacher ratio, teacher qualifications) are modeled to test the three theories outlined above. Each latent variable is estimated from a set of related measured variables. Finally, a set of other school process variables are used to examine the degree to which the practices and process employed at schools moderate the effects of SES composition on educational attainment and whether the practices and process effects attainment directly. Of particular importance is whether the school offers sufficient college preparatory coursework for students to meet college entrance requirements. The models for outcomes 3-4 will also include measures collected from the college such as the type of school (e.g., community college), the tuition costs, selectivity, etc., which may impact accessibility.

### **Models**

Because students in ELS data are nested in schools, a multilevel model is used. However, rather than

multilevel regression, the standard multilevel approach, this study employs a multilevel structural equation model (Muthen, 1989, 1994) which has the same advantages over standard multilevel models as SEM has over multiple regression—namely that errors in the measurement of variables can be contained, that latent variables can easily be included, and that causal pathways between variables can easily be modeled. The multilevel SEM is ideally suited for estimating the direct and indirect pathways of the theoretical models outlined in Figure 1 in order to disentangle the potential factors influencing the relationships between SES composition and educational attainment.

For each of the four research questions posed above, a series of models will be estimated on the corresponding outcome. A “step-up” strategy is employed to address the research questions. This strategy involves beginning with simpler models and adding variables in sets that are both cohesive and theoretically informed. Following the common practice in multilevel modeling, the first model is the unconditional model, which contains no independent variables. This model provides a sense of the amount of variability that is between schools on the attainment outcome. The second model is the student model, which controls for student inputs across schools and provides a baseline for estimating school effects. The third model examines the association between SES composition and the educational attainment outcome with no other school-level variables in the model. This model provides an estimate of the *total* effect of SES composition on attainment. The fourth model includes the four school-level latent constructs as specified in Figure 1. This model provides estimates of the direct and indirect effects of SES composition on attainment. Finally, in addition to the four latent constructs, the fifth model will also include measures of school recourses, structures, process and practices, to determine the degree that these school effects moderate the impact of SES composition on attainment.

### **Policy Relevance**

The notion that schools could be separate but equal—segregated along racial or social class lines—was rejected when the U.S. Supreme Court ruled in favor of Brown in the history lawsuit against the Board. However, recent evidence shows that schools have become more highly segregated in the past 15 years (Orfield, 2005). As elaborated on in the introduction above, educational attainment is broadly associated with economic success and indicators of health and societal integration. The results of the proposed study will have important policy ramifications because it will provide evidence of how school-based social segregation results in inequality of educational opportunity for members of some sectors of society. The fact that such inequality is linked to various measures of quality of life and wellbeing makes this issue all the more policy relevant.

The results will be useful for informing educational policy makers on how to minimize the negative consequences of attending a low SES school and more generally, on how to improve equality of opportunity. If school resources and structures largely moderate the effects of SES composition on achievement gains and attainment, for instance, then equalizing schools on those characteristics may be sufficient to remedy the inequality. On the other hand, if SES composition is largely a peer effect that directly impacts educational attainment, then more drastic measures may be necessary, such as a redistribution of students to equalize SES composition across schools.

### **Objectives for the Proposed Study**

The results of the proposed study will be presented at both the AIR Forum and the AERA national conference. A minimum of two academic papers will be prepared and submitted for review in top-tier education journals. One will focus on the implications of the results to higher education and will be directed toward an audience of higher education scholars, practitioners, as well as policy makers. The other will be directed toward education researchers more generally and will cover both the sociological underpinnings of the study and the policy implications of the results. In addition to these academic manuscripts a policy brief will be produced and disseminated to various policy organizations, educational entities, and government agencies. The policy brief will not exceed 6 pages and will highlight the key findings in an accessible manner.

### **Relationships to PI's Research Agenda**

The proposed study is a natural extension of the principal investigator's research agenda. He past research has focused on school effects generally and recent papers have examined the effects of socioeconomic segregation on student learning (Rumberger & Palardy, 2005a) and differential school effects based on socioeconomic composition (Palardy, in press). He is familiar with NCES databases and has used NELS data extensively in his work. His methodological background has prepared him to utilize the advanced statistical models proposed here. He is very excited about the prospect of this project because of the dearth of research addressing this issue.

### **Connection to the Literature**

The proposed study extends the literature in important ways in a few different areas. First and foremost, it will extend the literature on how school social composition impacts attainment beyond high school graduation. It will also address the viability of three different theoretical frameworks that have been posited in the literature regarding how SES composition manifests its impact on educational attainment and other outcomes. The results will also

update the literature on the effects of SES composition on dropout, which is based on data 15 or more years old and may be outdated.

I am aware of a few research projects presently being conducted that have overlap with the proposed study. Russell Rumberber at the University of California, Santa Barbara, a former colleague, is examining the California dropout problem broadly. Jeanie Oakes at UCLA and the director of UC ACCORD, is studying the effects of school racial composition on educational equity.

Appendix

Figure 1: Multilevel Theoretical Framework of the Effects of HS Socioeconomic Composition on Student Attainment

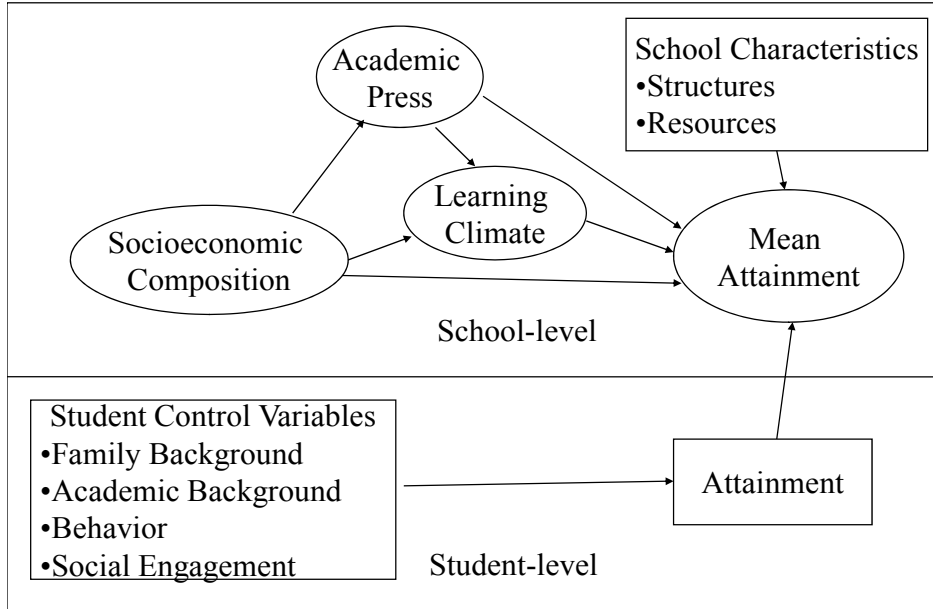


Figure 2: Sequential Samples for Modeling Educational Attainment and Persistence

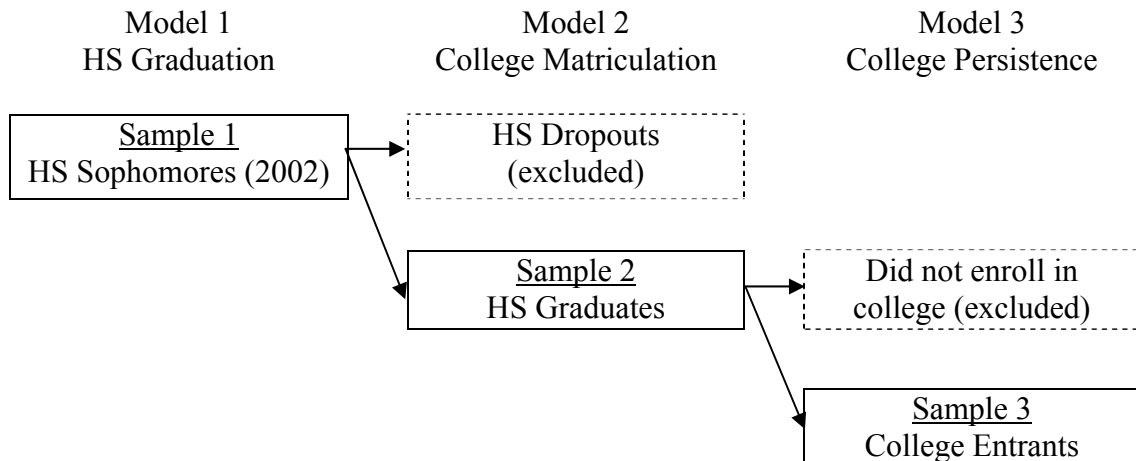




Table 1: Preliminary List of Independent Variables

VARIABLE NAME	DESCRIPTIONS
Student-level variables	
<b><i>Student/family variables</i></b>	
BYTXCSTD	(BYTXCSTD) 10 <sup>th</sup> grade math and reading achievement test composite, standardized.
Female	(BYSEX=2)
Asian	(BYRACE=2)
Black	(BYRACE=3)
Hispanic	(BYRACE=4,5)
Other	(BYRACE=1,6)
Non-traditional family	Does not live with both birth parents (BYFCOMP=2-9)
SES	Socioeconomic status composite (BYSES2)
College prep	College preparatory track (BYSCHPRG=1)
Misbehavior	Composite (BYS24D, BYS24E, BYS24F, BYS24G)
School-Level Variables	
<b><i>Student Composition</i></b>	
Non-traditional family	Mean (BYFCOMP=2-9)
Percent minority	(CPO2PMIN)
Mean prior achievement	Mean (BYTXCSTD)
Mean GPA	Mean GPA for 10 <sup>th</sup> grader (F1RGP10)
Mean SES	Mean socioeconomic status composite (BYSES2)
<b><i>School Resources</i></b>	
Student/teacher ratio	Student/teacher ratio(CP02STRO)
B.A. degree English	Bachelor's degree held English (BYTE30C=1)
B.A. degree Math	Bachelor's degree held Math (BYTM30C=1)
English teacher experience	GT 4 years of HS English teaching experience (BYTE26B $\geq$ 4)
Math teacher experience	GT 4 years of HS math teaching experience (BYTM26B $\geq$ 4)
Full English certification	Full certification in English (BYTE29=1)
Full math certification	Full or standard certification in Math (BYTM29=1)
Teacher salary	Average teacher salary (BYA26A + BYA26B)
<b><i>School Structures</i></b>	
Urban	School located in urban setting (BYURBAN=1)
Rural	School located in rural setting (BYURBAN=3)
Small school	Total school enrollment 2001/02 (CP02STEN=1-600)
Large school	(CP02STEN=1201-1800)
Extra large school	(CP02STEN=1801+)
<b><i>School Processes and Practices</i></b>	
Homework time	Hours of HW (BYS34A+BYS34B)
College expectations	Expect to graduate from college (BYS56 $\geq$ 5)
College prep program	College preparatory-academic (BYSCHPRG=2)
Academic climate	Principal component (BYS27A, BYS27B)
Disciplinary climate	Principal component (BYS21B, BYS21C)
Academic press	

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