Connecting entrance and departure:

The transition to ninth grade and high school dropout

Ruth Curran Neild
Graduate School of Education
University of Pennsylvania

Scott Stoner-Eby
Carolina Population Center
University of North Carolina, Chapel Hill

Frank F. Furstenberg, Jr.
Department of Sociology
University of Pennsylvania

Abstract

Much of the literature on school dropout implies a randomness to the timing of when leaving school becomes more appealing than staying. In this paper, we examine how one crisis point in urban students' educational careers – the transition to high school – affects the likelihood of dropping out. We find that despite an extensive set of pre-high school controls for family, achievement, aspirations, school engagement, and peer relationships, ninth grade outcomes add substantially to our ability to predict dropout. The importance of the ninth grade year suggests that reducing the enormous dropout rates in large cities will require attention to the transition to high school.

One of the most telling statistics about urban high schools is the proportion of students who leave school without ever graduating. While dropping out is not unique to urban districts, the highest rates of student dropout occur in large cities such as New York, Detroit, Baltimore, Chicago, and Philadelphia (Balfanz and Legters 2001). Methods for estimating the number of dropouts vary across cities, but it is not uncommon for reported dropout rates in urban districts to exceed 30 percent, with some districts reporting that half of their students have left school before graduating (Hammack 1986; Wehlage and Rutter 1986). The sheer size of many of these urban school systems means that a dropout rate of 30 percent represents the loss of thousands of students from each grade cohort. Moreover, district-wide averages do not tell the story of the most seriously troubled urban high schools, where less than half of the freshmen receive a diploma in four or even five years. Dropping out is not a form of "social deviance" in these schools (Wehlage and Rutter 1986), but rather a well-traveled path.

Urban teenagers who leave school without graduating often have experienced earlier crisis points in high school, notably severe academic difficulty during the first year of high school (ninth grade for most students in the United States). First-time freshmen in Philadelphia who repeat ninth grade have a greatly elevated risk of dropping out of school within four years. Among students who were first-time freshmen in Philadelphia during the 1996-97 school year, for

example, 57 percent of those not promoted to tenth grade had dropped out by the end of four years. In contrast, a much smaller percentage of their promoted classmates (11%) had dropped out of school by that time. The academic difficulties that arise during the transition to high school have been well-documented in large cities like Baltimore (Legters, Balfanz, Jordan and McPartland 2002), Chicago (Roderick and Camburn 1996, 1999), and Philadelphia (Neild and Balfanz 2001), as well as other locations (Simmons and Blyth 1987; Roderick 1993). In Philadelphia, one-third of the first-time freshmen fail to accumulate enough credits for promotion (Neild and Balfanz 2001), and in Chicago, more than 40 percent fail a major subject during the first semester (Roderick and Camburn 1999).

Explanations for the difficulty that urban students encounter in the transition to high school have focused variously on urban ninth graders' more limited access to family resources that could help them navigate the transition (Simmons and Blyth 1987); their weak mathematics and reading comprehension skills, combined with teachers who lack the knowledge or curricula required to instruct teenagers whose basic skills need work or who take a "sink or swim" approach to their students (Roderick and Camburn 1999; Neild and Balfanz 2001; Balfanz, McPartland, and Shaw 2002); the stresses and opportunities of a new social evironment, particularly when several middle schools "feed" into a single high school (Schiller 1999); and an unfamiliar, larger, more anonymous, and more

complex school structure (Roderick and Camburn 1996, 1999; Lee and Smith 2001). The disorganization of many large urban high schools around issues like course scheduling (Riehl, Pallas, and Natriello, 1999; Weiss, 2001) also contributes to student course failure. A commonplace of these explanations is that the process of moving between institutions – the transition itself – is at the root of the academic distress of ninth grade, rather than individual developmental changes that just happen to coincide with the move to high school.

While there is evidence that the transition to high school is a difficult one for urban students, and that there is an association between repeating ninth grade and dropping out of school, it has not yet been established using a stringent set of controls that ninth grade experiences have an independent effect on dropout. One could argue that student experiences in ninth grade – and the grades and attendance rates that testify to those experiences - are simply proxies for student background, behaviors, attitudes, and achievement that were in evidence prior to entering high school. There are good reasons to try to establish the independent effect of the high school transition grade on dropout. If ninth grade outcomes are simply reflections of pre-high school student characteristics, then we might conclude that the high school transition year, despite its storied difficulties, has little impact itself on students' educational trajectories. In contrast, if it turns out that ninth grade outcomes are predictors of dropping out, despite a strong set of controls, then we would have evidence that the transition to high school alters

educational trajectories in ways that could not be predicted prior to entering high school. It would also suggest that a key point for dropout prevention is the ninth grade.

In this paper, we examine the impact of the ninth grade on dropping out of school, controlling for pre-high school academic characteristics (attendance, achievement, and grades) as well as a wide range of demographic, family, peer, and attitudinal factors that are not necessarily apparent in school records but have been shown to affect the probability of dropping out (for overviews, see Rumberger 1987; Wagenaar 1987; and Vacha and McLaughlin 1992). We find that despite an extensive set of controls for pre-high school student characteristics, ninth grade course failure and attendance have a substantial impact on the probability of dropping out. In our final analysis, we examine the extent to which the effect of ninth grade performance can be explained by freshman reports of academic and social engagement with school, positive relationships with teachers and peers, and perceptions of safety at school.

Although this data set does not permit us to model the effects of school organizational patterns and practices (such as schools-within-a-school or team teaching) that might mitigate the negative effects of the transition, our starting point is that school-level factors contribute to the difficulty that students have in ninth grade. High schools vary in their ninth grade course failure rates, even controlling for the race, gender, age, and achievement composition of the student

population (Roderick and Camburn 1999). Likewise, evidence from comprehensive school reform programs like Talent Development High Schools suggests that freshman failure rates are responsive to changes in school organization and curriculum (Legters et al. 2002). Rather than identifying the school-level factors that contribute to the academic distress of ninth graders, we highlight the independent role of ninth grade in dropping out as well as the longer-term consequences of course failure during ninth grade. We argue that enabling students to make a successful transition into high school should be one of the highest priorities of urban high schools trying to reduce their dropout rates.

PREDICTORS OF DROPPING OUT

The individual, family, demographic, and socioeconomic correlates of dropping out are well-established. Older students, males, minorities, and children in single parent families, low-income families, or families in which the parents have relatively little education are at greater risk of dropping out of school. Eventual dropouts are more likely than those who finish high school to have repeated a grade, and to have lower grades and test scores, more infrequent attendance, and a history of in-school behavior problems (see Rumberger, 1983 and 1987 for reviews of research on the correlates of dropping out).

Researchers now generally agree that dropping out is the culmination of a process of progressive disengagement with the academic and/or social dimensions

of schooling (Rumberger 1987, 2000; Finn 1989; Newmann, Wehlage, and Lamborn 1992; Garnier, Stein, and Jacobs 1997). For some students, the seeds of dropout appear to be planted quite early. Using longitudinal data, researchers have been able to predict high school dropout from experiences in school extending as far back as the elementary years (Barrington and Hendricks 1989; Ensminger and Slucarcick 1992; Roderick 1993; Alexander, Entwisle and Horsey 1997). But while early experiences may predispose certain individuals to dropping out of school, there is general agreement among scholars that the reasons for school-leaving are not found solely in attributes of the individual, but rather result from the interaction of individuals and the educational, family, and community contexts which they are located. For example, students whose parents use an "authoritative parenting style" and are more involved in their schooling are less likely to drop out of school (Astone and McLanahan 1991; Rumberger, 1995). The academic and social climate of schools is associated with dropout rates, independent of the student composition, resources, and structural characteristics of the school (Bryk and Thum, 1989; Rumberger, 1995; Rumberger and Thomas 2000).

While recognizing the disengagement that precedes dropout and the effects of school, family, and community enviromental conditions on dropping out, the literature often seems to imply a randomness to the timing of when students come to believe that leaving school is preferable to staying. An

exception is work by Roderick (1993) who used student records from a small city in Massachusetts to identify key educational transitions that predicted dropping out. She found that students who experienced academic difficulty in ninth grade had an elevated risk of dropping out. We build on Roderick's work by incorporating a strong set of controls for family background and student attitudes, behaviors, and expectations that are not necessarily evident in school records but are strong predictors of dropout. Many events that trigger dropout are undeniably unique to the individual, introducing "noise" into the model; yet we suggest that there socially-patterned events and common turning points in students' educational careers can jump-start the process of disengaging from school and greatly increase the probability of dropping out. The timing and patterning of these critical events among urban students, particularly those attending large, nonselective neighborhood high schools, further suggest that what schools do – or don't do – to help their students make the critical transition to high school may play a central role in the process of dropping out.

THE NINTH GRADE TRANSITION

Many urban ninth graders display signs of academic distress during the very first marking period of high school. During the 1999-2000 school year, 17 percent of the first-time ninth graders in Philadelphia missed one-third or more of the first 30 days of school, up from 4.7 percent during their eighth grade year.

Course failure also begins early: at neighborhood high schools, about 20 percent of Philadelphia's first-time freshmen received straight F's in core courses for the first marking period, and 40 percent passed no more than half of their core courses. Major recovery from the first marking period is possible but not probable. About half of those who failed all their core courses in the first marking period also failed them for the year; two-thirds of those who passed no more than half of their core courses during the first marking period had the same outcome for their final grade (Neild and Balfanz 2001). While some ninth graders have experienced academic difficulty during their elementary and middle school years, those earlier problems, at least as revealed through school records, do not begin to approach the crisis proportions of the ninth grade.

The fact that a sizeable proportion of urban freshmen are overage (15 or older) when they begin high school is one indicator of academic difficulty that resulted in grade retention during the elementary or middle grades years. Nationally, the proportion of 12-to-14 year old students who were overage for their grade rose from 20 percent to 32 percent between 1980 and 1993 (Roderick 1995). Still, urban school systems often have limits on the number of times students can be retained in grade. As a result, elementary and middle grades students who have reached the maximum number of grade retentions can continue to fail their classes and still be promoted. This pattern comes to a screeching halt once students enter high schools that use a "credits earned" promotion system.

Even for those students who have managed to pass their classes in middle school, the bar for passing may have been set so low that they are unprepared to deal with the comparably greater rigors of high school. Evidence from Philadelphia indicates that many middle school teachers, particularly those at schools serving the most disadvantaged students, are inexperienced, not certified to teach, and/or teaching subjects for which they are not academically prepared (Useem and Neild 2001). Interviews with urban freshmen who have taken seminars to help them with the transition to high school suggest that they appreciate being taught such basics as how to take notes, organize their papers in a notebook, and study for tests (Corbett and Wilson 2000).

When they begin the ninth grade, urban students often encounter high schools that are large, impersonal, and deeply disorganized. It is easy for a ninth grader to get lost in the shuffle, skip school without consequence, or quietly fail without any concerted intervention by the school. The turbulence that often characterizes the beginning of the school year – overcrowded classrooms, insufficient textbooks, and schedule changes – increases the likelihood that ninth graders will fail courses (Weiss 2001). Secondary-certified teachers are trained to teach algebra and literature, rather than to help students with basic literacy and numeracy (Balfanz, McPartland, and Shaw 2002). Moreover, ninth grade teachers are more likely to be uncertified, new to teaching, and/or new to the school than those teaching upper-grades students (Neild 2002). Finally,

nonselective schools in urban areas of concentrated poverty may simply be overwhelmed by the sheer number of students who need extra attention and help (Neild and Balfanz 2001). Absent a school-wide intervention to improve outcomes for ninth graders, individual teachers may conclude that nothing can be done and that widespread course failure is inevitable.

There are a number of ways in which ninth grade failure may be related to dropping out of school. Course failure itself may be a proxy for disengagement from school that either began or became amplified when students made the transition to high school, or it may be a proxy for the disengagement that followed after doing poorly in classes. Course failure may also be an indicator of weak academic or study skills, which may render students unlikely to be promoted irrespective of their engagement with school. Making little headway, these students may become discouraged about their prospects of graduating and drop out of high school. While the primary purpose of this paper is to rule out the possibility that ninth grade outcomes are simply proxies for eighth grade outcomes, we also attempt to untangle some of the processes that underlie the academic turmoil of ninth grade.

DATA AND METHODS

Sample

The data for this analysis come from the Philadelphia Education

Longitudinal Study (PELS), which has followed the high school careers of approximately 10 percent of the students who were eighth graders in the Philadelphia public schools during the 1995-96 school year. The PELS sample was selected from a school district file containing the name and school attended of each eighth grader in the system, including students receiving special education services and those in disciplinary programs. Students and their parents were interviewed by telephone during the summer after the eighth grade year and have been followed up with telephone interviews after every subsequent academic year. Of the 2933 students sampled for the survey, 1470 were contacted and interviewed during the first wave, along with their parents. Survey data from telephone interviews with students and their parents, conducted during the summer after eighth grade and each subsequent year, are merged with individual-level student record data on grades, test scores, behavior, attendance, and other pertinent variables maintained by the School District of Philadelphia.

With approximately 200,000 students and about 250 schools, the public school system in Philadelphia is one of the largest in the country. With more than three-quarters of its students classified as low-income, the district is also one of the poorest. The majority of students in the public schools score "below basic" on standardized achievement tests, and most of the schools are on the state's list of schools needing improvement required by the 2001 No Child Left Behind legislation. Philadelphia is one of five large cities in which high schools with

senior classes only 30 percent as large freshman classes (an indicator of weak "promoting power" and a high dropout rate) are concentrated (Balfanz and Legters 2001).

Whites make up about 45 percent of Philadelphia's population, but only 20 percent of the students in the public schools are white. The majority of the district's students are African American and Latino. The predominance of minority students in the district, combined with Philadelphia's highly segregated neighborhoods (Massey and Denton 1993), contributes to a school system that includes many highly-segregated schools. Efforts to desegregate the schools are strongest at the high school level, where there is an extensive school choice system that includes eleven magnet school campuses and four vocational schools. About 70 percent of the approximately 50,000 students attending public high schools are enrolled in neighborhood high schools, though not necessarily their own neighborhood high school.

Dependent variable

We calculate dropout rates by following the educational careers of the PELS students for four years after they began high school. The cohort method permits analysis of how and when attrition occurs as a grade cohort moves through the educational system, allowing us to identify the points at which students run into trouble when they enter high school. At the same time, we

recognize that this way of estimating dropout has its own limitations. We are able only to examine students who attended Philadelphia public schools for both eighth and ninth grade, leaving out the approximately 10 percent of ninth graders who were new to the district as well as students who entered the district after ninth grade. We do not include the 1.4 percent of the sample who were retained in eighth grade at the end of the 1995-96 school year. In addition, we do not incorporate the dropout rates of students who left the district for private school or another school district; it is possible that some of those who left for other districts or non-public schools subsequently dropped out of school. Nevertheless, the data presented in this paper characterize the vast majority of students who pass through Philadelphia's public high schools.

School districts in large cities use a variety of methods to determine the proportion of students who have dropped out of school (Hammack 1986). A detailed discussion of Philadelphia's dropout statistics and our assumptions in calculating who dropped out of school appears in Appendix A. Dropout rates are calculated using each student's status in the district as of June 2000, the time by which the students in our sample who completed high school in four years would have graduated. We want to underscore that the dropout rates used in this paper are four-year dropout rates. Those who are coded as not having dropped out include students who graduated and students who were still enrolled at the end of their fourth year in high school. Some of those still enrolled in June 2000 may

not have returned in September or, if the did return, may have dropped out during the fifth year ofhigh school. For all of our measures using school district data, we removed from the denominator students who were coded as having moved from the area (presumably to another school), who enrolled in private school, who were deceased, or who suffered (using school district terminology) an "emotional disturbance."

Students who were placed in correctional facilities are a trickier group to categorize. There is no way to decipher from either district data or survey data whether a string of absences indicates that students had effectively dropped out of school before being incarcerated or whether it merely indicates a lag time between being incarcerated and being removed from the rolls. However, in most cases, being incarcerated seriously interrupts a student's education and makes earning a high school diploma more elusive, at least in the near term. For this reason, we have coded incarcerated students as dropping out of school. Appendix A includes our categorization of the school district codes into dropout or departure from the district for another reason (Table 1).

Independent variables

A list of the independent variables, along with their means and standard deviations, appears in Appendix B.

Demographic and family background

Information about students' age, race/ethnicity, and gender was obtained from school district files. From the parent interview conducted after the teen's eighth grade year, we obtained information on parent marital status, education level of the parent(s) living in the teen's household, whether the parent received welfare, and whether the child had ever repeated a grade.

Academic characteristics

From school district records, we obtained students' eighth grade scores on the math and reading comprehension multiple choice sections of the Stanford Achievement Test (SAT-9). We averaged the Normal Curve Equivalent scores (NCEs) on these two sections into a single indicator of achievement. The proportion of courses failed in eighth grade and ninth grade was calculated from report card files obtained from the district. Information on student participation in special education or English-as-a-Second-Language classes was also obtained from school district records.

Student attitudes and behaviors in eighth grade

From the student interview conducted in the summer after eighth grade, we obtained information on students' educational aspirations. To control for pre-high school involvement in or approval of activities that set students in opposition

to the school and/or put them at risk of incarceration (which is defined as dropout in this paper) or teen pregnancy (which could also lead to dropout), we created an index of responses to nine questions about how many of their friends approved of drinking, drugs, sex, and skipping school; how many of their friends liked school, did well in school, and liked school; and how many had suggested illegal behaviors or stolen something worth more than $50. In addition, we created a measure of self-esteem from questions about whether the student was happy with himself or herself most of the time and liked the kind of person he/she was.

Eighth grade academic and social engagement

To fully control for what students bring with them into ninth grade, it is important to measure how engaged students were with the academic and social dimensions of school during eighth grade. Researchers have treated engagement as both a behavioral and a psychological construct (Finn and Voelkl 1993; Smerdon 1999). At the most basic level, students are academically engaged with school to the extent that they follow rules and participate superficially, but deeper academic engagement is evidenced by effort to learn and master skills (Lamborn, Brown, Mounts, and Steinberg 1992; Newmann et al. 1992). In our models, indicators of academic engagement included attendance during eighth grade, student self-reports about the number of times they had been late to school and the incidence of class-cutting, and a measure of engagement with classes and

learning. This measure was constructed from questions about whether the student felt that he/she was learning a lot in school; the topics were usually interesting; the student usually looked forward to school; and the student usually worked hard to do his/her best in school during eighth grade.

Engagement with school also has a social component – that is, a sense of integration and acceptance into the peer social system at the school. We created an index of social integration in eighth grade from students' responses to questions about whether they felt that they didn't know a lot of other kids at the school, often felt left out, and felt that no one cared about them at school.

Ninth grade engagement and experiences

We investigated the effect of students' reported experiences during the first year of high school by using data from the post-ninth grade survey of students. For those students who were not interviewed at the end of the school year, we used their responses to the same questions on a survey given during the late fall and early winter of the ninth grade year. The scales, variable wording, means, and standard deviations of these ninth grade variables appear in Appendix C.

We examined the effects of several measures of engagement in ninth grade. *Social engagement* was measured with two separate variables indicating the extent to which the student felt that no one at the school cared about him/her

and that he/she did not know many students at the school. *Engagement with teachers* was measured with a scale comprised of responses to questions about whether most teachers expected the student to do his/her best; were willing to provide extra help; and cared whether students did their work. We measured *academic engagement* with a scale of items that included whether the student felt that he/she had learned a lot during ninth grade, looked forward to school, worked hard in school, and were often bored in school and whether the topics studied were usually interesting.

Other students' academic engagement was measured with a scale comprised of questions about whether other students in the school felt that it was important to attend school every day, attend all their classes, pay attention in class, do homework, and get good grades. The pro-school orientation of close friends was addressed with two questions: how many friends thought it was important to finish high school, and how many thought it was important to get good grades.

As a general measure of adjustment to ninth grade, we asked the student whether they sometimes wished that they could be back at their eighth grade school.

Finally, we incorporated a scale measuring perceived safety in classes at the school, in the halls and bathrooms of the school, outside around the school, and on the way to and from school. DeLuca and Rosenbaum (2001) have

suggested that fears about safety may contribute to dropping out. Actual victimization was measured by student reports of whether anything had been stolen from them during ninth grade or whether they were in a fist fight, threatened, or offered drugs.

THE LANDSCAPE OF DROPOUT

Four years after they left eighth grade, just 46 percent of the students sampled for the PELS study who were not retained in eighth grade (n=2892) had graduated from the Philadelphia public school system. An additional 15 percent were still enrolled in Philadelphia schools (meaning that they had not earned enough credits to graduate, but had not dropped out of school either); 12 percent had left the Philadelphia public schools for a private school or another school district; 19 percent had dropped out; 2.7 percent had been removed involuntarily, primarily through incarceration; and 5 percent were either "lost" in the system or had left for reasons that we could not determine from district data.

Among those students who did not transfer to another school or school district, just over half (53 percent) graduated in four years. An additional 25 percent had dropped out of school, and 17 percent were still enrolled in school at the end of four years. Of those who remained in school, about a quarter still were only in ninth or tenth grade after four years of high school, calling into serious

question the probability of their graduating. An additional 5 percent were "lost" in the system and could not be identified either as dropouts or graduates.

The four-year dropout rate varied considerably by school (see Figure 1, which shows the proportion of dropouts for each school, accompanied by error bars indicating plus or minus two standard errors). The school dropout rate is the proportion of the first-time freshmen a given school who dropped out in four years, regardless of whether they were at the same school when they dropped out. A number of schools had dropout rates close to 0, while others had four-year dropout rates of around 40 percent.

Figure 1 about here

The data highlight the difficulty students have in negotiating ninth grade successfully. Of those who dropped out by the end of four years, about two-thirds (65.8%) had not been promoted at the end of their first year in ninth grade. Conversely, among those who graduated in four years, only 6 percent had repeated ninth grade. In fact, the largest proportion of dropouts (43.9%) never got beyond ninth grade (see Table 1). Another 30 percent were in tenth grade when they dropped out of school. The proportion of students who drop out or who are removed from the school rolls increases most substantially in the third year of high school, when many students turn 17 and, according to Pennsylvania law, can legally drop out of (or be removed from) school. Fewer than 20 percent of those

who dropped out did so before their third year in high school.

Table 1 about here

MODELS PREDICTING DROPOUT

A series of logistic regression models estimates the effects of various characteristics on dropping out and the independent role played by ninth grade experiences. Because PELS students are clustered in schools, we can not make the standard regression assumption that observations are independent. Students in the same schools are likely to be more similar to themselves tha to students in other schools because they have experienced the same institutional conditions. To adjust for the underestimation of standard errors caused by this clustering, we calculate corrected standard errors using the Huber/White/sandwich estimator of variance (Huber 1967; White 1980). The data are also weighted to account for the oversampling of students from smaller schools.

Table 2 about here

The models control for student characteristics prior to entering high school that previous research has found to be associated with dropping out of school. In Table 2, Model 1 incorporates basic demographic characteristics of gender and race or ethnicity. Black males, white males, and Latino males are all significantly more likely to drop out than black females (the reference category). None of the female ethnic groups is significantly different from black females. The rates for

Asians are based on very small numbers (11 females and 14 males) and are a bit unstable as more variables are added. We retain Asian students in the analysis to avoid reducing the number of cases available for estimating the effects of the variables at the heart of this paper, but we urge caution in drawing conclusions about Asian students from this data.

Model 2 adds measures of students' family backgrounds: receipt of public assistance, family structure, and parental education. Students whose families reported receiving welfare when the child was in eighth grade are more likely to drop out. Children who had at least one parent with some college experience or a college degree were significantly less likely to drop out than either those whose parents did not graduate from high school or those whose parents graduated from high school but did not report going to college. Whether a child comes from a home with married parents is not related significantly to high school dropout. Once family background characteristics are controlled, white males have somewhat higher relative odds than before of dropping out, suggesting they have higher dropout rates than might be expected based on their more advantaged backgrounds. The difference for Latino males is slightly reduced compared to Model 1.

Model 3 incorporates the full set of eighth grade variables to control for experiences and attitudes toward school already present before students entered ninth grade. We find that student performance on standardized tests – one

indicator of how much difficulty ninth graders will have with high school-level work - is powerfully associated with dropping out. Students with spottier eighth grade attendance were also more likely to drop out. The percentage of courses failed in eighth grade is not statistically significantly associated with dropping out in this model because it is so highly correlated with eighth grade attendance (pearson correlation coefficient -.66). For most students, poor attendance is likely a proxy for the broader issue of disengagement from school; course grades may be a similar measure of disengagement, given their correlation with attendance. At the same time, low grades may be an indicator of weak academic and study skills, reducing the probability of success in ninth grade.

Students who express greater enjoyment of attending school and learning in eighth grade are significantly less likely to drop out, as well as those who reported having few friends who were disengaged from school or who participated in behaviors that most schools try to discourage. Students who are less happy with themselves on the self-esteem measure are slightly more likely to drop out, but this only approaches statistical significance at the 0.05 level.

Being older at the beginning of ninth grade is strongly associated with dropping out even with grade repetition through eighth grade controlled. Our grade repetition variable only approaches statistically significance at the 0.05 level, but this is because it is so highly correlated with age. When included without the age variable, the grade repetition variable is highly significant. We

include both variables in these models in order to provide as strong a set of controls for pre-ninth grade difficulties as possible. The age variable is likely picking up grade repetition from teens who were not in the school district in earlier years and whose parents did not report grade repetition on the survey. Students may also have repeated more than one grade if they did so in another elementary school system and then again in Philadelphia; this multiple repetition would not be picked up by our grade repetition dummy variable, but instead would show up in the age variable. Age also likely has an independent effect on dropping out because once students are 17 years old they gain the legal right to drop out of high school.

Even controlling for these other factors, parent education level continues to make a difference in a students' probability of dropping out. Teens whose parents have at least some college background remain less likely to drop out than those whose parents never went to college. It is notable that students who aspire to a four year college degree are more likely to drop out than those aspiring to less a four-year college education. In simpler models not shown here, this apparent reversal is not the case. With this set of eighth grade controls, black females are significantly less likely to drop out than most of the other race and sex groups.

When variables for ninth grade attendance and the percent of courses failed are introduced in Model 4, the importance of the ninth grade in students' educational careers becomes apparent. Despite the number and breadth of

controls for pre-high school experiences and dispositions, the percent of courses failed in ninth grade is a highly significant predictor of eventual dropout. We used the percent of courses failed (ranging from 0% to 100%) rather than a dichotomous variable for repeating ninth grade (that is, a variable where 1=repeated and 0=did not repeat) because we wanted to distinguish between those who might have been close to being promoted, credit-wise, and those who had accumulated few or no credits. For every percent increase in courses failed in ninth grade, the odds of dropping out within four years increase by 2.4 percent; the difference in odds for a student who passed all of his or her courses and a student who passed only half of them is substantial. Freshman course failure and attendance are highly correlated: when attendance and course failure are included separately in the model, each is highly significant. Together, the two variables contribute substantially to accounting for the variation in dropout rates in the model: adding the ninth grade variables results in a change in the percent of variance explained from 24.8 percent to 32.2 percent, an increase of 33 percent.

Some have argued that grading standards are more rigorous in high school, so that a grade of D in eighth grade is equivalent to an F in ninth grade. If this were the case, then the ninth grade "courses failed" variable could be picking up variation that already existed in eighth grade, but that we did not adequately capture in our controls. As a check, we re-ran the regressions using the percent of D's and F's in eighth grade. Despite this more liberal definition of eighth grade

course failure, the coefficient for the percent of ninth grade courses failed remained highly significant as well as the largest in terms of magnitude.

When examining ninth grade variables, the effects of some eighth grade factors change. While eighth grade test scores remain statistically significant, eighth grade attendance only approaches significance, in part because eighth grade attendance is correlated with both ninth grade course failure and ninth grade attendance. Parental education, pro-social orientation of friends, and academic engagement, all measured before ninth grade, continue to be statistically significant. Having a parent with some college experience decreases the probability of dropping out by 50 percent, relative to a student whose parent had dropped out of high school; a one-point decrease on the four-point scale of friends' pro-social orientation increases the probability of dropping out by 34 percent; and a one-point increase in academic engagement (on a four-point scale) decreases the odds of dropout by 36 percent. Each year older a student is upon entering high school increases the odds of dropping out by 109 percent.

EXPLAINING NINTH GRADE ACADEMIC DIFFICULTY

Our model identified ninth grade failure as a major independent predictor of dropping out. However, it does not tell us the process by which the ninth grade experience brings about such dismal academic outcomes for students. As an exploratory investigation of ninth grade experiences that are related to later

dropout, we created ten variables from the interview that students completed after their ninth grade year. These variables and scales are described in the data and methods section above and detailed in Appendix C.

Our question with these variables is how the effects of the ninth grade attendance and course failure change when we consider students' ninth grade relationships with peers and teachers, their academic engagement, and their perceptions of safety. If these factors were able to reduce the effect of ninth grade attendance and course failure, it would suggest that we were beginning to identify some of the important processes that result in ninth grade failure and, ultimately, dropping out. In Table 3, Model 5 incorporates the same variables as Model 4, but only for those students for whom we have post-ninth grade data.

Table 3 about here

The additional variables for specific experiences in the ninth grade reduce the magnitude of the ninth grade course failure variable by a rather small 5 percent, and the magnitude of the ninth grade attendance variable drops by 24 percent. While the reductions in the magnitude of the ninth grade courses failed and attendance variables are not large, the new variables add to our understanding of the ninth grade experience in several ways. First, although the general measure of feeling safe at school does not have a statistically significant effect, the personal victimization variable is statistically significant. That is, the more a student personally experienced crime – including threats, theft, or assault of any

sort – the more likely they were to drop out. A one-point increase on the personal victimization scale (which ranges from 1 to 2.75) increases the odds of dropping out by 100 percent. We suggest that the relationship between dropping out and concerns for personal safety is worthy of further investigation but we urge some caution in interpreting our results. It may be the case that the kinds of students who were physically assaulted, threatened, or otherwise harmed may be more likely to be involved in activities that put them at risk of injury – and also at risk of incarceration, which in this analysis is defined as dropping out of school.

Students who strongly disagreed that they experienced any wistfulness for eighth grade were less likely to drop out. This greater contentment with their ninth grade experience, at least in comparison to eighth grade, decreased the odds of dropping out by 80 percent. This variable tells us rather little about why these students preferred ninth grade to eighth grade – that is, whether they liked the greater independence of high school, or the social scene, or the intensified academic challenge, or a combination of these or other factors – but it does provide additional evidence that a more satisfying transition (even independent of getting good grades) increases students' likelihood of remaining in school.

As with eighth grade academic engagement, ninth grade academic engagement is associated with significantly lower odds of dropping out. A one-point increase in engagement (on a three-point scale) decreases the odds of dropping out by 68 percent. It is also notable that both eighth grade and ninth

grade academic engagement are statistically significant in this model. We suggest that their independent effects are further evidence that eighth and ninth grade experiences have separate influences on dropping out of school.

CONCLUSION

The analyses presented in this paper suggest several conclusions. First, the descriptive data for this urban school system indicate that the modal dropout grade is ninth grade, even though students may have been enrolled in high school for three or even four years. Credit-wise, the largest proportion of dropouts are barely out of the starting gate in high school. Our analysis suggests that ninth grade problems are not simply a reflection of what students bring with them when they enter high school. Our ability to predict dropout within four years of entering high school increases considerably when we know how students fare during their high school transition year. The experience of the ninth grade year contributes substantially to the probability of dropping out, despite controls for demographic and family background characteristics, previous school performance, and pre-high school attitudes and ambitions. While dropping out may indeed be a process with roots in students' earliest educational experiences (Alexander et al. 1997), these analyses suggest that there are specific points in students' educational careers where degree completion hangs in the balance and educational trajectories are reshaped. Difficulty in navigating of these

treacherous waters, even for individuals who looked similar in other respects at the time of entrance to high school, substantially increases the probability of leaving high school without ever finishing. One implication of these findings is that decreasing the dropout rate, at least among urban students, will require paying attention to the critical high school transition year. Put more strongly, we argue that the inner-city dropout epidemic cannot be ameliorated unless high schools organize themselves to help students through the transition to high school. High schools will need to re-imagine the experiences of upperclassmen as well, lest those grades become versions of the present ninth grade debacle, but addressing the transition year is an important first step.

We argue that longitudinal studies of dropout are enormously useful in identifying particular points in students' educational careers where school problems worsen or begin to manifest themselves. Following a group of students into high school enabled us to identify both who dropped out (and stayed out of school) and what some of the individual-level correlates were. While we have examined students' reactions to ninth grade, including their engagement with teachers, peers, and learning, we were not able to identify school organizational characteristics or practices which may have given rise to these attitudes and behaviors. During the students' freshman year, most of the PELS students were assigned to smaller organizational units within their school (known as schools-within-a-school), but we could not identify the size of this unit, whether their

teachers worked in teams, the kind of curriculum and instruction they experienced, or whether their teachers were well-qualified to teach. Research that gets closer to the classroom level, examining the effects of school and classroom characteristics on ninth grade failure and, ultimately, dropping out of school would advance our understanding of what factors reduce academic difficulty during the ninth grade year, and whether there is a consequent decrease in the probability of dropping out of school.

While we do not have direct evidence on the relationship between school conditions and ninth grade failure, and hence the connections between school conditions, ninth grade failure, and dropping out, recent data from comprehensive school reform projects suggests that changes in the way high schools do business can decrease the ninth grade course failure rate. Since work at these high schools has begun relatively recently, it will be some time until we know whether the decrease ninth grade failure rate has had an impact on the overall incidence of dropping out.

For example, the Talent Development High School model, one of the federally-designated comprehensive school reform models for high schools, has had substantial success in helping schools to organize themselves for ninth grade success (Legters et al. 2002). At the first two Talent Development sites in Philadelphia, promotion rates for first-time freshmen increased by 47 percent at one school and 65 percent at the other, while promotion rates fell at several the

two demographically-similar control schools (Philadelphia Education Fund 2000).

The Talent Development high school model addresses the high school transition with several changes that are not typical of large urban neighborhood high schools. In order to create a space where students are well-known by their teachers and peers, and where they are less likely to be bullied or harassed by upperclass students, the Ninth Grade Academy is located in a physically separate section of the school building. Within this school-within-a-school structure, teachers are divided into teams made up of math, English, social studies, and science teachers who teach the same groups of students who move together through the school day. These teams of teachers, led by a Team Leader, meet frequently throughout the year to discuss the academic progress of their ninth graders.

Since most urban ninth graders enter ninth grade with weak math and reading skills but are increasingly expected to pass college preparatory courses such as Algebra in order to be promoted to tenth grade (Neild and Balfanz 2001), students experience a core curriculum with a "double-dose" of English and mathematics. In math, ninth graders take a first-semester "transition math" course which backfills on intermediate skills like decimals, fractions, and negative and positive numbers. The first semester English course works with the students on strategic reading skills.

While projects like the Talent Development High School model provide

evidence that massive ninth grade failure (and, we suspect, high rates of dropping out) is not inevitable, one of the sobering lessons from comprehensive reform projects is that turning around student outcomes to even a moderate extent is an enormous undertaking. Tinkering around the edges of the traditional high school will make little difference in outcomes for students. A dropout prevention class here, a mentor there, a new math curriculum, rewards for attendance or good grades, a new discipline policy – we argue that none of these piecemeal solutions will have an appreciable impact on the large number of urban students who are vulnerable to difficulty during the ninth grade.

In fact, substantially affecting ninth grade failure, and the associated dropout rate, may require doing away with the high school transition entirely, or else allowing students to make a transition to a high school that is much smaller than the typical urban neighborhood high school. In this era of increased interest in experimenting with non-traditional school structures, perhaps we should create more schools where students can remain from K-12 or small, flexibly-operated schools where "being known" is taken for granted. There is evidence that students in K-8 schools fare better during the middle grades than their peers who have made the transition to middle schools or junior high schools (Simmons and Blyth 1987; Roderick 1993). These studies suggest that students who are spared the transition to high school may be able to avoid much of the academic distress of students at urban neighborhood high schools. Further, evidence on the

institutional correlates of dropping out suggests that school size has a direct effect on dropout, particularly in schools with high proportions of low-income students (Rumberger 1995; Rumberger and Thomas 2000). Smaller schools may thus contribute to a more successful transition and higher graduation rate, although the weak academic skills of entering ninth graders indicate the need for better curricula as well as a more personal environment.

Figure 1

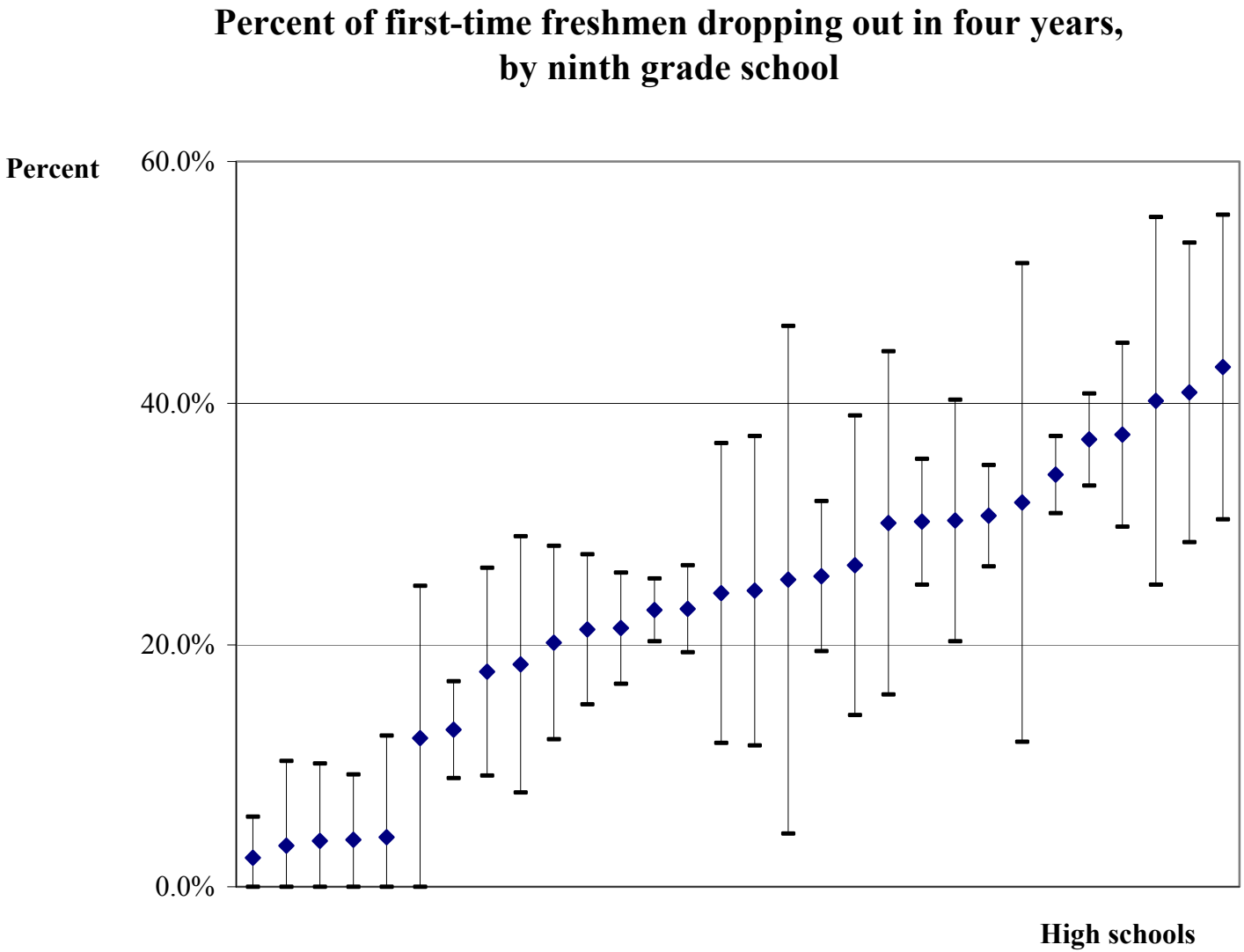
Percent of first-time freshmen dropping out in four years, by ninth grade school
Percent
60.0%
40.0%
20.0%
0.0%
High schools

Table 1. The Timing of Dropout

Grade in High School		**Year in High School**	
Ninth	43.9	First (96-97)	2.0
Tenth	30.7	Second (97-98)	16.4
Eleventh	15	Third (98-99)	42
Twelfth	6	Fourth (99-00)	39.6
Ungraded	4.5		
Total	*100.1*	*Total*	*100.1*
n	*631*	*n*	*629*

Table 2: Logistic Regression Models Predicting High School Dropout

Independent Variables	(Model 1)	(Model 2)	(Model 3)	(Model 4)
Demographic Characteristics				
Black Male	0.717***	0.715***	0.663***	0.683***
	(0.162)	(0.165)	(0.171)	(0.167)
White Female	0.006	0.264	0.772**	0.912***
	(0.269)	(0.241)	(0.253)	(0.248)
White Male	0.798**	1.086***	1.196***	1.166*
	(0.270)	(0.275)	(0.343)	(0.393)
Latino Female	0.361	0.235	0.104	-0.021
	(0.431)	(0.467)	(0.563)	(0.589)
Latino Male	0.918***	0.776**	1.143***	1.204***
	(0.216)	(0.240)	(0.249)	(0.291)
Asian Female	0.125	0.461	1.141**	0.754+
	(0.798)	(0.694)	(0.426)	(0.442)
Asian Male	-0.135	0.213	0.652	1.452
	(0.858)	(0.900)	(1.478)	(1.289)
Family Background (in 8th grade)				
Welfare Status		0.393*	0.277	0.047
		(0.194)	(0.260)	(0.294)
Parent(s) h.s. graduates		-0.239	-0.127	-0.095
		(0.247)	(0.255)	(0.279)
Parent(s) some college		-0.929**	-0.612*	-0.703*
		(0.285)	(0.271)	(0.296)
Parents married		-0.308	-0.061	-0.087
		(0.196)	(0.204)	(0.228)
Eighth Grade Controls				
Standardized Reading and Math Scores			-0.023***	-0.016*
			(0.0064)	(0.0069)
Percent of courses failed			0.003	-0.0103
			(0.0082)	(0.0073)
Percentage days present			-0.044***	-0.0171+
			(0.0096)	(0.0094)
Days cut classes			0.005	-0.011
			(0.012)	(0.0139)
Days late			-0.007	-0.0092
			(0.0095)	(0.0092)
Academic engagement			-0.593***	-0.449**
			(0.139)	(0.144)

***p<.001 **p<.01 *p<.05 + p<.1

Table 2, continued

			(Model 3)	(Model 4)
Social integration			-0.105	-0.0496
			(0.119)	(0.124)
Medium aspirations			0.463*	0.511*
			(0.212)	(0.249)
High aspirations			-0.02	-0.023
			(0.249)	(0.293)
Self-esteem			0.319+	0.298
			(0.172)	(0.208)
Anti-social friends			-0.428**	-0.416**
			(0.143)	(0.139)
Other Pre-ninth grade controls				
Age at beginning of 9th grade year			0.733**	0.739**
			(0.240)	(0.275)
Grade repetition through 8th grade			0.426+	0.381
			(0.247)	(0.289)
Special education status, 8th grade			-0.557+	-0.459
			(0.303)	(0.321)
English as a second language status, 8th grade			-1.293	-1.39
			(1.102)	(1.067)
Ninth grade experiences				
Percent of courses failed				0.0236***
				(0.0045)
Percent of days present				-0.013+
				(0.0077)
Constant	-1.61	-1.27	-7.71	-9.886
Pseudo R-squared	0.022	0.059	0.248	0.322
Log-likelihood	-663.61	-638.58	-517.36	-460.01
N	1251	1251	1251	1251

Table 3: Logistic Regression Models with Additional Ninth Grade Variables

Independent Variables	(Model 5)	(Model 6)
Demographic Characteristics		
Black Male	0.769***	0.830***
	(0.207)	(0.205)
White Female	1.032***	0.976**
	(0.287)	(0.302)
White Male	0.981*	0.911*
	(0.427)	(0.437)
Latino Female	-0.0431	0.0576
	(0.523)	(0.529)
Latino Male	0.709+	0.854*
	(0.369)	(0.356)
Asian Female	1.552*	1.695*
	(0.67)	(0.678)
Asian Male	2.038+	2.221*
	(1.098)	(0.941)
Family Background (in 8th grade)		
Welfare Status	0.08	0.110
	(0.343)	(0.349)
Parent(s) h.s. graduates	-0.087	-0.106
	(0.340)	(0.355)
Parent(s) some college	-0.623+	-0.678+
	(0.340)	(0.355)
Parents married	0.004	0.003
	(0.238)	(0.246)
Eighth Grade Controls		
Reading and Math scores	-0.013	-0.017+
	(0.0082)	(0.009)
Percent of courses failed	-0.009	-0.008
	(0.009)	(0.009)
Percentage days present	-0.018	-0.024*
	(0.013)	(0.012)
Days cut classes	-0.017	-0.02
	(0.014)	(0.016)
Days late	-0.012	-0.013
	(0.01)	(0.01)
Academic engagement	-0.521*	-0.471*
	(0.180)	(0.187)

***p<.001 **p<.01 *p<.05 + p<.1

Table 3, continued

	(Model 4)	(Model 5)
Social integration	-0.041	0.018
	(0.147)	(0.157)
Medium aspirations	0.466*	0.475*
	(0.227)	(0.238)
High aspirations	-0.071	-0.045
	(0.325)	(0.338)
Self-esteem	0.238	0.286
	(0.232)	(0.217)
Pro-social friends	-0.416**	-0.377**
	(0.143)	(0.145)
Other Pre-ninth grade controls		
Age at beginning of 9th grade year	0.826**	0.853**
	(0.261)	(0.251)
Grade repetition through 8th grade	0.417	0.501+
	(0.276)	(0.289)
Special education status, 8th grade	-0.29	-0.363
	(0.338)	(0.37)
English as a second language status, 8th grade	-1.091	-1.202
	(1.049)	(1.058)
Ninth grade experiences		
Percent of courses failed	0.025***	0.023***
	(0.005)	(0.005)
Percent of days present	-0.011	-0.008
	(0.008)	(0.008)
Additional ninth grade experiences		
Felt caring at school		0.330
		(0.257)
Knew kids at school		-0.011
		(0.235)
Friends support finishing h.s.		0.459+
		(0.272)
Friends desire good grades		-0.0397
		(0.253)
Ninth grade adjustment		-0.594*
		(0.266)
Teacher engagement		0.26
		(0.293)
Academic engagement		-0.519*
		(0.231)
Other students' academic engagement		-0.128
		(0.230)
Safety		0.163
		(0.117)

Table 3, continued

		(Model 5)
Personal victimization		0.694* (0.301)
Constant	-11.53	-14.17
Pseudo R-squared	0.317	0.336
Log Likelihood	-385.84	-375.03
N	1088	1088

Appendix A
Defining dropout in Philadelphia

Information about students' whereabouts and reasons for leaving the public school system in Philadelphia flows from the individual schools to the central record-keeping system. Several issues complicate the accurate assessment of who has dropped out of school. These issues can be summarized by considering the two variables in the district data that must be combined in order to determine which students have left the district, and why.

The first is a "status" variable, which indicates whether a student is currently enrolled, graduated, has withdrawn from the district (for any reason, including moving from the area), or has an unknown status. Each year, students must be "claimed" by a school in order to be considered enrolled; in theory, this means that a student must have actually shown up at school during that year. Students who are not claimed by a school, but who have not officially withdrawn from the system, are classified as "unknown." In Philadelphia, there are very few students who fall into any category other than enrolled, withdrawn, or graduated. In June 2000, under 3 percent of the students in the PELS sample were unaccounted for. [1]

Students can become classified as "withdrawn" either by formally advising the school of their intention to leave, or by being removed from the rolls

[1] The percent of "unknowns" in Table 1 is higher because for our analysis we also classify students as unknown if they left the district but have no codes listing their reason for leaving.

by school officials after they have been truant for some time. After 10 consecutive absences, students are placed on an "Absent on Roll" (AOR) list, after which point they can be dropped by the schools as long as they are over the compulsory school age – that is, at least 17 years old. In practice, there can be lag time between the point at which a student's attendance indicates that he or she has stopped coming to school and removal from the school rolls. As a result, the true dropout rate at any given point is almost always higher than the dropout rate derived from the proportion of students who have formally "dropped out"—or been removed—from the district.

At the same time, Philadelphia's school performance index gave schools a major incentive to drop students from the rolls, so that there are relatively few students who are listed on the rolls but actually have not come to school for a long time. Students who are on the rolls but do not take the Stanford Achievement Test (the district's standardized test) receive a 0 score, which is factored into overall student performance on these exams. The absenteeism of d*e facto* dropouts also brings down a school's attendance rate and lowers the overall graduation rate, both indicators on which schools are evaluated. Thus, a strong incentive exists to remove truant students from the rolls. The performance-index penalties for keeping a truant student on the rolls are greater than the penalty for dropping him or her from the rolls. As currently constructed, the performance index provides no incentive to schools to encourage students who have had

serious truancy problems to return, given the likelihood that they will lower the school performance measures.

Philadelphia has approximately 30 codes to describe students' reasons for leaving, but as is the case with the "status" codes, only a fraction of those codes is used with any frequency. The most commonly used codes are "moved from Philadelphia" (31.7% of the PELS sample who ever left the district for any reason); over compulsory school age, an indicator of dropout (30%); left for a private school in Philadelphia (14%); and removed non-voluntarily, the vast majority of which were assigned to a correctional institution (11.8%). A complete list of the possible drop and status codes appears in Table 1 of this appendix.

Whether a student who has left the district is coded as leaving for another school system or dropping out altogether can make all the difference in a district's dropout rate. Clearly, there is plenty of room for misinformation, assumptions, or active deception by school personnel (Hammack, 1986), particularly when students have not formally withdrawn from the district. At the same time, strict district policies regarding who can be classified as having transferred to another school can make the dropout rate seem even higher than it actually is. Philadelphia's policy is rather strict: a student can only be classified as having gone to another school if there is proof that he or she has actually enrolled

In Philadelphia, the vast majority of students who, according to district data, left for private school or another school district exited between eighth and

ninth grade, or between their first and second years in high school. Of those who left the district for another school, about half left before high school began; about three-quarters left before the second year in high school. Parents of students who left for another school were more likely to be college-educated than those whose children remained in the district. White males are particularly likely to be coded as leaving for another school: 18 percent of the white males in the PELS sample had left for another school by the end of the sophomore year (in comparison, for example, to 6.2% of the black males). The concentration of the codes for leaving for another district in the first two years of high school, as well as the more advantaged status of the families who left, suggests to us that there is a fair amount of credibility to these particular codes.

Appendix A, Table 1: Categorization of school district "drop codes"

Dropped out	Removed from analysis	
	Non-voluntary removal	Enrolled elsewhere
▪ Parents in Philadelphia or office roll ▪ Job Corps ▪ Runaway ▪ Whereabouts unknown ▪ Voluntary withdrawal ▪ Marriage (over age 17) ▪ Probable employment ▪ Needed at home ▪ Other (over compulsory school age) ▪ General employment certificate ▪ Correctional institution ▪ Involuntary withdrawal ▪ Beyond 2-mile limit – no transportation	▪ Deceased ▪ Emotional disturbance	▪ Went to private school ▪ Moved from Philadelphia ▪ Migrants

Appendix B: Description of Variables (Unweighted)

Variables	Description	Mean	SD
* Created with data from school district records			
Dependent Variable			
*Dropped Out	1 = Dropped out by end of fourth year	0.234	0.424
Demographic Characteristics			
*(Black Female)	(Black Female– Omitted category)	0.347	0.476
*Black Male	1 = Black Male, 0 = Other	0.316	0.465
*White Female	1 = White Female, 0 = Other	0.106	0.307
*White Male	1 = White Male, 0 = Other	0.117	0.321
*Latino Female	1 = Latino Female, 0 = Other	0.049	0.215
*Latino Male	1 = Latino Male, 0 = Other	0.044	0.205
*Asian Female	1 = Asian Female, 0 = Other	0.009	0.093
*Asian Male	1 = Asian Male, 0 = Other	0.011	0.105
*Age	Age in yrs at beginning of 9th grade	14.44	0.574
Family Background			
Welfare Status	1 = Family received Welfare in 8th grade	0.265	0.441
(Parent < h.s.)	(Parent(s) did not graduate from high school – Omitted category)	0.190	0.393
Parent h.s. grad	1 = Parent(s) graduated from high school but not more.	0.473	0.499
Parent some college or more	1 = Parent(s) attended some college or more	0.337	0.473
Parent's marital status	1 = Married when student was in 8th grade	0.435	0.496

Continued

Appendix B, continued

Variables	Description	Mean	SD
Educational Aspirations			
(Low aspirations)	1 = Student aspires to less than 4 yr college 0 = Other	0.305	0.461
Medium aspirations	1 = Student aspires to 4-year college but not more 0 = Other	0.436	0.496
High aspirations	1 = Student aspires to advanced degree 0 = Other	0.258	0.438
Social integration at school	Summative scale from student's likert responses whether in 8th grade school they: "Didn't know a lot of kids", "Felt left out", and "Felt no one cared." (Range 1 to 4; higher value means more integration.) Cronbach's alpha: 0.63.	1.782	0.649
Pro-social friends	Summative scale from student's count (most, half, few, none) of friends in 8th grade who: "Do well in school", "Work hard on school work", "Skip school", "Suggest illegal acts", "Have stolen worth $50", "Don't like school", "Think drinking is okay", "Think drugs are okay", and "Think it's okay to have sex." (Some items reversed; range 1 to 4; higher value means more pro-social friends.) Cronbach's alpha: 0.81.	2.736	0.677
Self-esteem	1 = Student strongly agreed he/she was happy with self most of the time and strongly agreed he/she liked the kind of person he/she was. 0 = Other combination of responses	0.409	0.492
Eighth Grade Achievement			
*Course failure	Percentage F's, 8th grade	7.14	14.96
*Standardized Tests	Average of Standardized Math and Reading test NCE in 8th grade	41.31	15.97

Continued

Appendix B, continued

Variables	Description	Mean	SD
Eight Grade Engagement			
*Attendance	Percentage of days present in 8th grade	88.24	12.28
Lateness	Number of times late in 8th grade. Range 0-51.	7.49	11.30
School Skipping	Number of times cut classes, 8th grade. Range 0-51.	1.56	5.65
Academic Engagement	Summative scale of responses to "You are learning a lot in school", "The topics you are studying are usually interesting", "You usually looked forward to school", and "You usually worked hard to do your best in school this past year". (Range 1 to 4; higher value means higher engagement.) Cronbach's alpha is 0.71.	3.28	0.520
Pre-High School Characteristics			
*Repetition	1 = Repeated a grade, 1st through 8th 0 = No grade repetition, 1st through 8th (Combined school district and PELS data)	0.349	0.477
*Special Ed.	1 = Special Education Status as of 8th grade, 0 = Not Special Education	0.127	0.333
*ESOL	1 = English for Speakers of Other Languages 0 = Not ESOL	0.015	0.122
Ninth Grade Experience			
*Course failure	Percentage F's, 9th grade	26.84	32.69
*Attendance	Percentage of days present in 9th grade	80.06	20.34

Appendix C. Exploratory Ninth Grade Variables

Variables	Description	Mean	SD
(Variables from PELS survey after 9th grade, or during 9th grade if not available; n=1088.)			
Felt caring	1 = Strongly disagreed that "You felt like nobody at school really cared about you." 0 = Disagreed, agreed, or strongly agreed	0.360	0.480
Knew kids	1 = Strongly disagreed that "You felt like you didn't know a lot of kids at your school." 0 = Disagreed, agreed, or strongly agreed	0.345	0.475
Friends support finishing high school	1 = Most friends "Think it is important to finish high school 0 = Some, few, or none of them	0.790	0.408
Friends desire good grades	1 = Most friends "Think it is important to get good grades 0 = Some, few, or none of them	0.589	0.492
Ninth grade adjustment	1 = Strongly disagreed that "A lot of times you wished you could still be at your 8th grade school 0 = Disagreed, agreed, or strongly agreed	0.197	0.398
Teacher engagement	Summative scale of responses to "Most teachers expect you to do your best", "Most teachers are willing to give you extra help if you don't understand something", and "Most teachers don't care if you don't do your work". (Some items reversed; range 0 to 2; higher value means better teacher quality.) Cronbach's alpha is 0.60.	1.688	0.403
Academic engagement	Summative scale of likert responses to "You learned a lot in school this past year," "The topics you studied this past year were usually interesting," "You usually looked forward to school", "You worked hard to do your best in school this past year", and "You were often bored at school". (Some items reversed; range 0 to 3; higher value means more academic engagement.) Cronbach's alpha is 0.68.	2.060	0.528

Continued

Appendix C, continued

Variables	Description	Mean	SD
Other students' academic engagement	Summative scale made from "Very true", "somewhat true", "not true" responses to at your school students feel it is important to "attend school every day", "attend all their classes", "pay attention in class", "do homework", "get good grades". (Range 1 to 3; higher value means more academic engagement.) Cronbach's alpha is 0.88.	2.191	0.502
Safety	Summative scale made from "Not safe", "somewhat safe", "mostly safe", "very safe" responses to "In your school, how safe did you feel," "In the hallways and bathrooms", "In your classes", "Outside the school", and "Travelling between home and school". (Range 1 to 4; higher value means safer.) Cronbach's alpha is 0.77.	2.867	0.685
Personal victimization	Summative scale made from "Never", "Once or twice", More often" responses to "How often did the following happen to you in school?" "You had something stolen", "You were in a fist fight", "You were threatened by another student", "You were offered drugs**".** (Range 1 to 2.75; higher means more victimization.) Cronbach's alpha 0.61.	1.252	0.300

References

Alexander, Karl, Doris Entwisle, and Carrie Horsey. 1997. "From First Grade Forward: Early Foundations of High School Dropout." *Sociology of Education* 70: 87-107.

Astone, Nan and Sarah McLanahan. 1991. "Family Structure, Parental Practices and High School Completion." *American Sociological Review* 56: 309-320.

Balfanz, Robert and Nettie Legters. 2001. "How Many Central City High Schools Have a Severe Dropout Problem, Where are They Located, and Who Attends Them? Initial Estimates using the Common Core of Data." Paper presented at the "Dropouts in America" conference, Harvard University, Cambridge, MA.

Balfanz, Robert, James McPartland, and Alta Shaw. 2002. "Re-conceptualizing Extra Help for High School Students in a High Standards Era." Paper presented at the Preparing For America's Future High School Symposium, Office of Adult and Vocational Education, U.S. Department of Education, Washington, D.C.

Barrington, Byron L. and Bryan Hendricks. 1989. "Differentiating Characteristics of High School Graduates, Dropouts and Nongraduates." *Journal of Educational Research* 82: 309-319.

Bryk, Anthony S. and Yeow Meng Thum. 1989. "The Effects of High School Organization on Dropping Out: An Exploratory Investigation." *American Educational Research Journal* 26: 353-83.

Corbett, H. Dickson and Bruce Wilson. 2000. *Students' perspectives on the Ninth Grade Academy of the Talent Development High Schools in Philadelphia*. Philadelphia: Philadelphia Education Fund.

DeLuca, Stefanie and James Rosenbaum. 2001. "Are Dropout Decisions Related to Safety Concerns, Social Isolation, and Teacher Disparagement?" Paper presented at the "Dropouts in America" conference, Harvard University, Cambridge, MA, 2001

Ensminger, Margaret and Anita Slucarcik. 1992. "Paths to High School Graduation or Dropout: A Longitudinal Study of a First-Grade Cohort." *Sociology of Education* 65: 95–113.

Finn, Jeremy D. 1989. "Withdrawing from School." *Review of Educational Research* 59: 117-142.

Finn, Jeremy D. and Kristin E. Voelkl. 1993. "School Characteristics Related to Student Engagement." *Journal of Negro Education* 62: 249-268.

Garnier, Helen, Judith Stein, and Jennifer Jacobs. 1997. "The Process of Dropping Out of High School: A 19-Year Perspective." *American Educational Research Journal* 34: 359-419.

Hammack, Floyd. 1996. "Large School Systems' Dropout Reports: An Analysis of Definitions, Procedures, and Findings." *Teachers College Record* 87: 324 – 341.

Huber, P. J. 1967. "The Behavior of Maximum Likelihood Estimates under Non-Standard Conditions." Pp. 221-33 in *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics, Vol. 1*. Berkeley: University of California Press.

Lamborn, Susie D., B. Bradford Brown, Nina S. Mounts, and Laurence Steinberg. 1992. "Putting School in Perspective: The Influence of Family, Peers, Extracurricular Participation, and Part-Time Work on Academic Engagement." Pp. 153-81 in *Student Engagement and Achievement in American Secondary Schools*, edited by Fred M. Newmann. New York, NY: Teachers College Press.

Lee, Valerie and Julia Smith. 2001. *Restructuring High Schools for Equity and Excellence: What Works.* New York: Teachers College Press.

Legters, Nettie, Robert Balfanz, Will Jordan, and James McPartland. 2002. *Comprehensive Reform for Urban High Schools: A Talent Development Approach*. New York: Teachers College Press.

Massey, Douglas and Nancy Denton. 1993. *American Apartheid*. Cambridge: Harvard University Press.

Neild, Ruth Curran and Robert Balfanz. 2001. "An Extreme Degree of Difficulty: The Demographics of the Ninth Grade in Non-selective High Schools in Philadelphia." Paper presented at the Annual Meetings of the American Sociological Association, Anaheim, CA.

Neild, Ruth Curran. 2002. "Ninth Grade Teacher Qualifications and Turnover in an Urban District." Unpublished manuscript.

Newmann, Fred M., Gary G. Wehlage, and Susie D. Lamborn. 1992. "The Significance and Sources of Student Engagement." Pp. 11-39 in *Student Engagement and Achievement in American Secondary Schools,* edited by Fred M. Newmann. New York, NY: Teachers College Press.

Philadelphia Education Fund. 2000. *Talent Development High School: First Year Results of the Ninth Grade Success Academy in Two Philadelphia High Schools, 1999-2000.* Philadelphia: The Philadelphia Education Fund.

Riehl, Carolyn, Aaron Pallas, and Gary Natriello. 1999. "Rites and Wrong: Institutional Explanations for the Student Course-Scheduling Process in Urban High Schools." *American Journal of Education* 107: 116-154.

Roderick, Melissa. 1993. *The Path to Dropping Out: Evidence for Intervention.* Westport, CT: Auburn House.

Roderick, M. 1995. " Grade Retention and School Dropout: Policy Debate and Research Questions" Phi Delta Kappa Center for Evaluation, Development, and Research, No. 15. Available at http://www.pdkintl.org/edres/resbul15.htm.

Roderick, Melissa and Eric Camburn. 1996. "Academic Difficulty During the High School Transition." Pp. 47-65 in *Charting Reform in Chicago: The Students Speak,* edited by Penny Sebring, Anthony Bryk, Melissa Roderick, and Eric Camburn. Chicago: Consortium on Chicago School Research.

Roderick, Melissa and Eric Camburn. 1999. "Risk and Recovery from Course Failure in the Early Years of High School." *American Educational Research Journal* 36: 303 - 343.

Rumberger, Russell. 1983. "Dropping Out of High School: The Influence of Race, Sex, and Family Background. *American Educational Research Journal* 20:199-220.

Rumberger, Russell. 1987. "High School Dropouts: A Review of Issues and Evidence." *Review of Educational Research* 57: 101-121.

Rumberger, Russell. 1995. "Dropping Out of Middle School: A Multilevel Analysis of Students and Schools." *American Educational Research Journal* 32: 583-625.

Rumberger, Russell and Scott Thomas. 2000. "The Distribution of Dropout and Turnover Rates among Urban and Suburban High Schools." *Sociology of Education* 73:39-67.

Schiller, Kathryn. 1999. "Effects of Feeder Patterns on Students Transition to High School." *Sociology of Education* 72: 216-233.

Simmons, Roberta and Dale Blyth. 1987. *Moving into Adolescence : The Impact of Pubertal Change and School Context*. New York: A. de Gruyter.

Smerdon, Becky A. 1999. "Engagement and Achievement: Differences between African-American and White High School Students." *Research in Sociology of Education and Socialization* 12: 103-34.

Useem, Elizabeth and Ruth Curran Neild. 2001. *Teacher staffing in the School District of Philadelphia*. Philadelphia: The Philadelphia Education Fund.

Vacha, Edward and T.F. McLaughlin. 1992. "The social structural, family, school, and personal characteristics of at-risk students: Policy recommendations for school personnel." *Journal of education* 174: 9-25.

Wagenaar, Theodore. 1987. "What do we Know About Dropping Out of High School?" *Research in the Sociology of Education and Socialization* 7: 161-190.

Wasley, Patricia, et al. *Small Schools: Great Strides*. New York: Bank Street College of Education, 2000.

Wehlage, Gary and Robert Rutter. 1986. "Dropping Out: How Much do Schools Contribute to the Problem?" *Teachers College Record* 87: 375 – 392.

Weiss, Christopher. "Difficult Starts: Turbulence in the School Year and Its Impact on Urban Students' Achievement." *American Journal of Education* 109 (2001): 196 - .

White, Halbert. 1980. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity." *Econometrica* 48: 817-30.