

Preventing Student Disengagement and Keeping Students on the Graduation Path in Urban Middle-Grades Schools: Early Identification and Effective Interventions

Robert Balfanz

*Center for the Social Organization of Schools
Johns Hopkins University*

Liza Herzog

*Philadelphia Education Fund
Philadelphia, Pennsylvania*

Douglas J. Mac Iver

*Center for the Social Organization of Schools
Johns Hopkins University*

This article considers the practical, conceptual, and empirical foundations of an early identification and intervention system for middle-grades schools to combat student disengagement and increase graduation rates in our nation's cities. Many students in urban schools become disengaged at the start of the middle grades, which greatly reduces the odds that they will eventually graduate. We use longitudinal analyses—following almost 13,000 students from 1996 until 2004—to demonstrate how four predictive indicators reflecting poor attendance, misbehavior, and course failures in sixth grade can be used to identify 60% of the students who will not graduate from high school. Fortunately, by combining effective whole-school reforms with attendance, behavioral, and extra-help interventions, graduation rates can be substantially increased.

Middle-grades students—especially those attending high-poverty urban schools with student bodies primarily made up of minority students—continue to be the underperformers of the U.S. educational system. Many of these students fall far behind the achievement levels of their agemates in more advantaged U.S. neighborhoods or in other countries (Balfanz & Byrnes, 2006; Hanushek & Rivkin, 2006; Schmidt et al., 1999) and begin showing clear signs of behavioral and emotional disengagement from school (Balfanz & Bocciafuso, 2007; Juvonen, Le, Kaganoff, Augustine, & Constant, 2004; Skinner, Zimmer-Gembeck, & Connell, 1998). Raising student achievement in high-poverty middle-grades schools requires intensive, comprehensive, and multidimensional reforms (e.g., Balfanz, Mac Iver, & Byrnes, 2006). Many recent reform efforts have focused on making middle-grades

schools more academically excellent by reforming the roles, skills, and outlooks of the adults who teach or administer in these schools and by improving middle-grades instructional materials and pedagogy (Goldsmith & Kantrov, 2001; Jackson & Davis, 2000; Juvonen et al., 2004). These efforts also embrace reforms designed to make the middle grades more developmentally appropriate for young adolescents and more caring, personalized, and supportive learning environments (Dickinson, 2001; National Association of Secondary School Principals, 2006). Much less attention has been paid to understanding the magnitude of student disengagement in high-poverty middle-grades schools, its impact on student achievement, and ultimately the role it plays in driving the nation's graduation rate crisis.

Through our own work in developing and evaluating the Talent Development Middle Grades (TDMG) and Talent Development High School comprehensive reform models (Legters, Balfanz, Jordan & McPartland, 2002; Mac Iver et al., in press)—and in helping a large number of

Correspondence should be addressed to Robert Balfanz, CSOS, 3003 N. Charles Street, Suite 200, Baltimore, MD 21218. E-mail: rbalfanz@csos.jhu.edu

high-poverty schools to implement these models—it became clear to us that most of the students who eventually dropped out began disengaging from school long before. We define school disengagement as a higher order factor composed of correlated subfactors measuring different aspects of the process of detaching from school, disconnecting from its norms and expectations, reducing effort and involvement at school, and withdrawing from a commitment to school and to school completion.

Our insights from working with urban schools and our reading of the literature on student engagement (e.g., Fredricks, Blumenfeld, & Paris, 2004) both suggested that a middle or high school student's decision to not attend school regularly, to misbehave, or to expend low effort are all consequential behavioral indicators of a student's growing disengagement from school and thus might be strongly predictive of dropping out. In addition, the research on self-confirming cycles—the cyclic relations among students' perceived control beliefs, engagement, and academic performance (e.g., Skinner, Wellborn, & Connell, 1990; Skinner et al., 1998)—led us to suspect that experiencing a course failure in the middle grades would be also be a strong predictor of eventually dropping out, because a course failure is something that dramatically dampens a young adolescent's perceived control and engagement and can also be directly caused by low engagement.

In pursuing these insights, we first documented how student attendance, behavior, and effort all have independent and significant impacts on the likelihood that students attending high-poverty middle-grades schools in Philadelphia will close their achievement gaps (Balfanz & Byrnes, 2006). Then, we learned how course failures and low attendance in eighth grade in Philadelphia are powerful and almost deterministic predictors of failing to earn promotion out of the ninth grade and ultimately dropping out (Neild & Balfanz, 2006a, 2006b). These findings led us to become deeply interested in working closely with community organizations and school districts in Philadelphia and several other large cities in an attempt to develop a feasible and effective early warning system that would make it possible to identify middle-grades students who are at risk of eventually dropping out and to institute prevention and intervention strategies that would help students back on a path that leads to graduation by providing the right kinds of supports. The main goal of this ongoing work is to identify at-risk students early in the middle grades and then to “intervene now, so that they will graduate later” (Garriott, 2007, p. 60). In seeking to develop an easily scalable early warning system for school disengagement, our work has focused on measures of behavioral engagement (e.g., Finn & Rock, 1997; Johnson, Crosnoe, & Elder, 2001; Sinclair, Chistenson, Evelo, & Hurley, 1998) rather than measures of emotional engagement and cognitive engagement (see Fredricks et al., 2004) because school systems already routinely collect indicators of behavioral engagement but seldom directly measure the other types.

This article emphasizes research, program development, and conceptual work focused on keeping urban middle-grades students attending majority-poverty and concentrated-poverty schools on a graduation path. Our work has been driven by three sets of questions: First, how widespread and how early in the middle grades does serious student disengagement from schooling occur? In high-poverty urban schools with a high population of minority students, does the intersection of early adolescence and the environmental/social conditions of concentrated, neighborhood poverty, produce high levels of disengagement as early as sixth grade?

Second, are there indicators schools can easily use to identify sixth graders who are beginning to disengage from schooling in a significant and consequential manner? Are there indicators which signal (absent substantial and sustained intervention) that there are high odds that a particular student is in trouble, will struggle academically, and ultimately drop out? In other words, can we trace the intermediate roots of the dropout crisis in high-poverty neighborhoods to the start of the middle grades? Finally, are there effective preventions and interventions and can they be assembled into a comprehensive set of reforms that are implementable by high-poverty schools?

EARLY ADOLESCENTS, HIGH-POVERTY NEIGHBORHOODS AND THE ROOTS OF DISENGAGEMENT FROM SECONDARY SCHOOLS

We chose to focus our initial efforts at identification, prevention, and intervention on sixth graders for several reasons. The School District of Philadelphia defines grade six as the official start of the middle grades, as do most other districts in the United States. This definition reflects the fact that, despite the more than 30 grade spans found in the schools attended by early adolescent students in the United States and the wide variety of grade spans even in Philadelphia, more early adolescent students attend a Grade 6 to 8 middle school than any other school type (Epstein & Mac Iver, 1990; Valentine, 2004). As a result, in Philadelphia and in many other places, entry into sixth grade corresponds with a school transition for a majority of the students (e.g., 55% of the students who were sixth graders in 1998 in Philadelphia had attended a different school as fifth graders in 1997). Further, regardless of the grade span of the school they attend, in many districts sixth graders must adapt to a host of changes such as more departmentalized staffing, larger class sizes, different assessment, grading, testing, and reporting practices, and more challenging and complex instructional programs that begin in the middle grades (Epstein & Mac Iver, 1990).

This focus on sixth grade continued to make sense to us after reading some of the recent literature on adolescent development and high-poverty neighborhoods (Bowen

& Bowen, 1999; Halpern-Felsher et al., 1997, Kowaleski-Jones, 2000). This literature documents how middle grades students in high-poverty neighborhoods face greater dangers and temptations than when they were younger and are often recruited into roles that interfere with school attendance and involvement (e.g., as they are recruited by their families to be caregivers, by drug gangs to be cheap labor, or by peers to be colleagues on out-of-school adventures). We became convinced that the combination of becoming an adolescent, moving into new organizations of schools with more complex academic and social demands, and living in a high-poverty area create unique conditions that can push students off the path to high school graduation regardless of their prior schooling experience and that these conditions require proactive and preventative middle-grades interventions. Further, high-poverty middle-grades schools are often marked by high degrees of bullying, fighting, teacher turnover, and even teacher vacancies (Balfanz, Ruby, & Mac Iver, 2002; Ruby, 2002; Useem, Offenber, & Farley, 2007). So, students entering the middle grades in high-poverty neighborhoods are more likely than in the primary grades to experience chaotic, underresourced classrooms and schools. Many of these students conclude that not much productive is going on in these schools (Wilson & Corbett, 2001).

In short, students entering the middle grades in high-poverty neighborhoods can experience a range of pull-and-push factors that may promote disengagement from schooling. The extent of this disengagement can be vividly seen in the sharp rise in truancy that often occurs once students enter the middle grades. For instance, in Baltimore's high-poverty neighborhoods of Clifton-Berea, Greenmount, Madison, Midway, and Park Heights, the percentage of students who miss more than a month of school jumps from 15% in the elementary grades to 55% in the middle grades (Baltimore Neighborhood Indicators Alliance, 2007). Not surprisingly, Roderick (1993) found that low-achieving students who displayed a significant rise in absenteeism at the start of the middle grades—a 10-day or more increase in absenteeism over the number of days they were absent in elementary school—were much more likely than other low-achieving students to never graduate.

PRIOR EFFORTS AT EARLY IDENTIFICATION OF STUDENTS WHO ARE FALLING OFF THE GRADUATION PATH

Given that high school dropouts have been a concern for more than 40 years, that many more minority students and students living in poverty drop out, and that dropping out has consistently been linked to student disengagement, it is surprising that the field of early indicators is underdeveloped (Jerald, 2006). There have been, at most, a handful of studies that have attempted to follow cohorts of students over extended periods of time to establish the contexts, points in

time, and school outcomes or events associated with students falling off the graduation path (e.g., Alexander, Entwisle, & Kabbani, 2001; Ensminger & Slusarcick, 1992). Even fewer of these studies have attempted to develop *typologies* that establish how different sets of factors and contexts derail different types of students or provide different paths to dropping out (Battin, Abbott, Hill, Catalano, & Hawkins, 2000; Cairns, Cairns, & Neckerman, 1989; Roderick, 1993). Fewer yet have then tested the predictive validity of these typologies with different cohorts of students (Janosz, Le Blanc, Boulerice, & Tremblay, 2000) or on the complete universe of students within a school district.

Janosz et al. (2000) constructed a typology of dropouts in Montreal based on cluster analyses of middle-grades students' responses to the Social Inventory Questionnaire. Eventual dropouts were divided into four types. *Quiet dropouts* were students who as early adolescents had no misbehavior and moderate or high levels of commitment to school, but whose achievement grades were lower than eventual graduates. *Disengaged dropouts* were students who had average or below-average levels of school misbehavior, low commitment to school, and average grades. *Low achiever dropouts* had a weak commitment to schooling, average or lower levels of misbehavior, and failing grades. Finally, *maladjusted dropouts* had very high levels of misbehavior, weak commitment to school, and poor grades. Janosz et al. then found these same four clusters in a replication analysis with an earlier cohort. Across the two cohorts, they found that the Quiets (good behavior and commitment but relatively low achievement grades) and the Maladjusted (poor behavior, low commitment, and poor grades) accounted for 77% to 85% of the eventual dropouts.

We note that most prior work on dropout indicators has been based primarily on special administrations of extensive surveys (sometimes involving repeated surveying) to a relatively small number of students. This can lead to rich insight into the underlying complexities and interplay between individual, social, and school factors in triggering dropping out. We are skeptical, however, that such an approach will ever be common in district-based dropout prevention programs. It is uncommon for districts to routinely administer extensive surveys to all their students or to have the expertise or leisure to create valid, reliable, and highly predictive scales and then to use these scales in sophisticated cluster analyses to classify all their students into various categories of risk.

One clear finding from prior work on dropout predictors is that, although different students begin their disengagement from school for different reasons, two clear paths emerge: one rooted primarily in academic struggle and failure and another grounded more in behavioral reactions to the school environment (misbehavior in school or a demonstrated aversion to attending school).

Another finding of importance to our work is that the impact of a risk factor often varies depending upon when it occurs in the life course. For example, Alexander et al. (2001)

followed a sample of first graders in Baltimore through high school and showed that different predictors had more or less power depending on when in a student's progression through school they occurred. Retention in any grade turned out to have a negative impact on a student's odds of making it through the ninth grade, but retention in the middle grades was particularly problematic.

Finally, our approach follows the work of Gleason and Dynarski (2002), which suggests that, to be useful, dropout predictors need a high predictive yield. A predictor has a high yield when most students flagged by it eventually fail to graduate and the predictor alone or in combination with other predictors identifies a significant portion of the students who will not graduate. Gleason and Dynarski noted that status variables such as race typically have a low predictive yield. The few studies that have been able to identify high yield predictors of dropping out have done so using small populations of students from a single high school or modest-sized town. These studies, though, have consistently found course grades, attendance, and misbehavior measures in the middle grades to be high yield predictors (Barrington & Hendricks, 1989; Lloyd, 1974; Morris, Ehren, & Lenz, 1991).

No study that we are aware of, however, has examined the questions of most interest to us: How early in the middle grades can a significant number of students in high-poverty school districts be identified who, absent intervention, will fall off the graduation path? How large a role does student disengagement play in falling off the graduation path in the middle grades? Equally important, can students be identified in a reliable and valid manner with indicators readily available and interpretable to school teachers and administrators?

DEVELOPING INDICATORS OF STUDENT DISENGAGEMENT AND EXAMINING THEIR IMPACT ON FALLING OFF THE GRADUATION PATH EARLY IN THE MIDDLE GRADES

Guiding Questions

Four questions guided our analyses:

1. Are significant numbers of students in high-poverty urban schools showing unmistakable signs of disengagement by sixth grade?
2. Do sixth graders who exhibit unmistakable signs of disengagement by struggling academically, not coming to school on a regular basis, and/or behaving inappropriately fall off the path to graduation in significant numbers?
3. Can we identify a set of indicators that flag sixth graders who have high odds of falling off the graduation track, and do these indicators individually and collectively identify a substantial percentage of the students who do not graduate with a high school diploma?
4. Can we end up with a parsimonious set of "early warning flags" from among the data already routinely collected

and reported at the individual level by school systems and readily available to and interpretable by school personnel? Schools will find an early warning system easier to implement if it does not require them to mount special data collection, entry, manipulation, and analysis efforts.

Outcome Variable

The outcome variable we used was whether or not the sixth graders in the cohort we followed graduated from the school district on time or within 1 extra year of their expected graduation date. We chose this as our outcome partly because of time and data constraints but also because in-depth analyses of the school district's data reveal that the overwhelming majority of graduates get their high school diploma on time, or within 1 extra year (Neild & Balfanz, 2006b). Thus, extending the analysis to 2 or more years beyond the expected graduation date would at most increase the graduation rate by a few additional percentage points. We also decided to focus on graduation rates rather than dropout rates. This means that students who transfer out of the school district (15% of those who leave the district) are included in the analysis as nongraduates. Although we briefly examine the impact of the identified indicators on whether the student dropped out versus transferred in a secondary analysis, our primary analyses focus on whether the sixth grader ultimately graduated from the school district. Some who transfer ultimately graduate from another district or from a private school, but Rumberger (2004) and others have shown that adolescents who transfer after experiencing school difficulties eventually drop out in high numbers and that the common practice of excluding transfers when computing graduation rates leads to overestimates of the actual rates.

Predictor Variables

We created four distinct sets of predictor variables based on prior work on behavioral disengagement, dropout prediction, and the student data routinely available in school systems:

1. Academic performance variables: standardized test scores from the spring of fifth grade and final course marks from sixth grade.
2. Indicators of misbehavior: end-of-year behavior marks in each course, in-school and out of school suspensions.
3. Attendance: both total days absent and by descending cut points, that is, percentage attending 80% or less.
4. Status variables that might indicate underlying but unmeasured academic or behavioral outcomes: special education status, English as a Second Language status, and being one or more years overage for grade.

Sample and Measures

We created an individual-level longitudinal dataset using attendance, demographic, administrative, course and credit,

and test data provided by the School District of Philadelphia. The dataset let us follow a universe sample of 12,972 students enrolled in sixth grade in 1996–97 over an 8-year period through to 2003–04, or 1 year beyond expected graduation for the cohort. The sample was predominantly composed of minority students: 64% were African American, 19% Whites, 12% Hispanics, and 5% Asians. Fifty percent were female. Four percent were English Language Learners, and 6% were special education students. Nineteen percent were overage for grade (already 12 or older upon entry to sixth grade). School-level data on free/reduced-price lunch eligibility indicate that 97% of the students attended a majority-poverty school and 67% a concentrated-poverty school.

The variables we analyzed included the following:

1. *End-of fifth-grade test scores* (students' scaled reading and math scores on the Pennsylvania System of School Assessment [PSSA]) were obtained. During the time of this study, the PSSA was administered in the 5th, 8th, and 11th grades.
2. *English courses* were included in this analysis if a course was described as a core English or Reading course taken in the sixth grade. *Math courses* were included if a course was described as a core math course taken in the sixth grade. For both courses, dichotomous variables indicating passing the course or failing it were created.
3. A *behavior mark* was assigned to each student by each classroom teacher in the final marking period and appeared on students' report cards along with their final achievement grades. This mark of "Unsatisfactory behavior," "Satisfactory behavior," or "Excellent behavior" represents the teacher's cumulative behavior assessment for the student during the sixth-grade year.
4. *Suspensions* were determined from district administrative records and were separated into in-school and out-of-school suspensions.
5. *Attendance* rates were calculated by dividing the number of days the student was present by the number of days the student was enrolled in a given school year.
6. *Graduation status* was determined from enrollment records. A student was considered to have graduated in a particular school year if his or her enrollment status was designated "G" (Graduated) as of October 1 following the close of the school year in question.
7. *Dropout status* was determined by examining the drop code list designed by the school district. All students who were assigned district drop or nondrop withdrawal codes were considered to have left the district. Transfers and moves were coded as nondrop withdrawals. In our 1996–97 sixth grade sample, 85% of all "leavers" are drops and 15% are transfers or moves.
8. *Demographic variables* such as race were determined from district demographic files.
9. *Special status* variables including special education (not counting the mentally gifted) or English as a Second

Language designations were ascertained from district administrative files.

We first subjected each variable that was a warning flag "candidate" to a two-pronged test: Did the flag have high predictive power (did about 75% or more of the sixth graders flagged not graduate from the school district on time or 1 year late), and did the flag have a high yield (did the flag identify a substantial percentage—about 10% or more—of the district's future nongraduates)? Once we identified flags that had both high predictive power and high yield, we then used logistic regression techniques to establish that each variable had significant and independent predictive power, even after controlling for the other flags and for demographic variables.

Identifying Warning Flags

Table 1 shows the predictive power and yield of the five best flags. Four of these flags met our two-pronged test:

- Attend school 80% or less of the time during sixth grade.
- Fail math in sixth grade.
- Fail English in sixth grade.
- Receive an out-of-school suspension in sixth grade.

A fifth flag, receiving an unsatisfactory final behavior mark in any subject in sixth grade, had only 71% predictive power but was kept in the analysis because (a) its yield was enormous (it identified 50% of the cohort's future nongraduates), and (b) students who possessed this flag in combination with a course failure flag were especially unlikely to graduate.

Attendance. Attending school less than 90% of the time in sixth grade increases the chance that students will not graduate. When attendance dips below 80% (missing 36 days or more in the year), our a priori threshold of 75% or more of the students not graduating is reached. Fifteen percent of sixth graders attended school less than 80% of the time. By the school year that ended in 2000, only 60% of these students were in the 9th grade as expected, and 28% had already left the district. Over time, an increasing number of the students with this flag slipped off the graduation path. For example, by 2002, only 15% of the students were in the 11th grade as expected, and 57% had left the district. Ultimately, as Table 1 shows, only 13% of the students with this flag graduated from the school district on time, with another 4% graduating 1 year late. Not only was this flag highly predictive, it had a 23% yield (identifying 1,605 of the 6,888 students in this cohort who never graduated from the school district).

Academic achievement. Consistent with findings from other cities (Balfanz & Boccanfuso, 2007), course failure was a better predictor of not graduating than were low test scores. Students who failed either a mathematics or English

TABLE 1
Who Didn't Graduate? Predictive Power and Yield of Selected Flags

Predictive Power: % with This Flag Who . . .	Flag in Sixth Grade (in 1997)				
	Attended \leq 80% ^a	Failed Math ^b	Failed English ^c	Suspended Out of School ^d	"Unsatisfactory" Behavior ^e
Graduated on time (in 2003)	13	13	12	16	24
Graduated 1 year late	4	6	6	4	5
Did <i>not</i> graduate by Oct. 2004	83	81	82	80	71
Yield: % of nongraduates flagged	23	21	17	10	50

^a $n = 1,934$. ^b $n = 1,801$. ^c $n = 1,409$. ^d $n = 845$. ^e $n = 4,893$.

course in the sixth grade rarely graduated from the school district. Fourteen percent of the sixth graders failed mathematics, and only 19% of these students ultimately graduated from the school district within 1 year of on-time graduation. Eleven percent of the sixth graders failed an English course, and only 18% graduated from the school district within 1 year of on-time graduation. Failing math had a 21% yield, identifying 1,459 of the 6,888 future nongraduates. Failing English had a 17% yield, identifying 1,155 of the nongraduates.

End-of-5th-grade test scores in reading and mathematics by comparison turned out to be poor predictors of who would stay on the graduation path. Only students with the lowest test scores (10th percentile or less) have significantly lower rates of reaching 12th grade on time, and even then failing math or failing English in 6th grade is more predictive of falling off the graduation path. Data from other cities—such as those reported in Balfanz and Boccanfuso (2007)—indicate that end-of-6th-grade test scores are also poor predictors of dropping out, a finding that is not surprising given the typical longitudinal correlation above .50 between 5th- and 6th-grade scores (Byrnes, 2007).

Suspensions. Six percent of the students received one or more out of school suspensions in sixth grade, and only 20% of these students graduated within 1 year of on-time graduation. Two hundred twenty-two 6th graders received in-school suspensions, and only 17% of them remained on the graduation path. The odds decreased even further for the 136 students who had two suspensions and the 74 students who had three or more.

Behavior grades. Receiving a final unsatisfactory behavior grade in any subject in the sixth grade significantly reduced the chances that sixth graders would graduate from the school district within 1 year of expected graduation. A large number (4,893) and percentage (38%) of sixth graders received at least one final unsatisfactory behavior grade. Only 24% of these students graduated on time from the school district, and an additional 5% graduated within 1 extra year. Furthermore, this predictor yields half (3,474 of 6,888) of the school district's future nongraduates. The number of students with at least one final poor behavior grade is greater

than the number of students who fail math, fail English, and are suspended combined.

In addition to being a significant warning flag in and of itself, unsatisfactory behavior magnifies the damaging effects of course failure on students' prospects of graduating. Of the sixth graders who failed math *and* had poor behavior, 87% failed to graduate. Of those who combined a course failure in English with poor behavior in any course, 89% failed to graduate. Unfortunately, 77% of the students failing math and 80% of the students failing English also had unsatisfactory behavior.

Finally, it is revealing that receiving an unsatisfactory final behavior mark in any subject and having none of the other highly predictive indicators (failing math or English, attending less than 80% of the time) is as predictive of falling off the graduation path as being suspended (and having no other indicators). Thirty-eight percent of the sixth graders with only an unsatisfactory final behavior mark graduated within 1 year of their expected graduation date compared to 36% of the students who were suspended. This indicates that (a) a single behavioral episode significant enough to bring suspension and (b) sustained, milder misbehavior (or perceived lack of effort) in a single course that leads to a poor final behavior mark both have approximately equal impacts in reducing the chances that students will graduate.

Status variables. Being either a special education student (not counting the mentally gifted) or an English Language Learner in sixth grade reduced students' odds of remaining on the graduation path. However, the predictive power of these variables fell substantially short of our required threshold of 75%. Being overage for sixth grade initially appears to be highly predictive that sixth graders will not graduate within 1 year of their expected graduation date. Only 29% of the 2,406 overage students in our sixth-grade cohort stayed on the graduation path. However, this is primarily because a high percentage of overage students failed math, failed English, attended less than 80% of the time, or had unsatisfactory behavior. The one-third of the overage students who did not have any of these other highly predictive flags graduated at the same rate as the overall cohort.

Final set of warning flags. Our analysis of academic performance, attendance, misbehavior, demographic, and status variables unearthed five 6th-grade warning flags that had sufficient predictive power and yield to be useful: failing math, failing English, attending less than 80% of the time, being suspended, and receiving a poor final behavior grade. Following our desire to be as parsimonious as possible, we decided to use poor final behavior grades as our primary misbehavior variable in the analysis that follows. This is because almost all students who were suspended also received a poor final behavior grade and four times as many students received a poor final behavior grade as were suspended.

Predicting Graduation From the Warning Flags

We used multivariate logistic regression to estimate the predictive power of each flag, controlling for the other flags and for the student's race. The analyses showed that, all else being equal, chronic absentees were 68% less likely than other students to graduate, those with an unsatisfactory behavior grade were 56% less likely to graduate than others, those who failed math were 54% less likely to graduate than others, and those who failed English were 42% less to graduate than others. Each flag was a statistically significant predictor ($p < .0001$) even after controlling for the other flags and for race. The flags as a set contributed 34 times more explanatory power in predicting graduation than did student race (the most common status variable used in prior attempts to develop dropout indicators).

Total predictive power of the flags. Overall, using our final set of four 6th-grade warning flags, 60% of the students who will not graduate from the school system within 1 year of expected graduation can be identified. Students with one or more of these flags have only a 29% graduation rate from the school district.

Although our analyses demonstrate the importance of these high-yield flags, almost one fourth of the students have *none* of these flags in sixth grade and still never graduate from the district. We hypothesized that a greater portion of these students—those with no flags who did not graduate—were transfers or moves. We found that, of the 2,765 students in this zero-flag /no-grad group, 21% transferred or moved, 74% dropped out, and 5% were still in school. As we move to the one-flag /no-grad group ($n = 2,224$), we expected there to be proportionally fewer transfers and moves, more drops, and more active enrollees. This proved to be the case, with 14% transfers/moves, 79% drops, and 6% still in school. For the two-flag/no-grad group ($n = 1,051$), there were 10% transfers or moves, 83% drops, and 7% still in school. For the three-flag/no-grad group ($n = 534$), there were 9% transfers/moves, 83% drops, and 7.5% still in school. Finally, for the all four-flag/no-grad group ($n = 301$), we had 8% transfers or moves, 90% drops, and 2% still enrolled.

TABLE 2
Warning Flag Combinations and Counts
for All 12,037 Sixth-Grade Students in the
School District of Philadelphia in 1996–97

Risk Category	<i>n</i>
Sixth graders, no flags (52%)	6,265
Sixth graders, one flag (29%)	3,498
Attendance	524
Behavior	2,577
Fail math	255
Fail English	142
Sixth graders, two flags (11%)	1,329
Attendance and behavior	367
Attendance and math	63
Attendance and English	53
Behavior and math	449
Behavior and English	304
Math and English	93
Sixth graders, three flags (5%)	619
Att. + beh. + math	142
Att. + beh. + Eng.	95
Beh. + math + Eng.	307
Att. + math + Eng.	75
Sixth graders, all four flags (3%)	326

Note. Att. = attendance; beh. = behavior; Eng. = English.

Combinations of the flags. The raw univariate predictive power and yield for each flag reported in Table 1 includes students with just the flag *and* students with the flag plus additional flags. Examining the occurrence of multiple flags and their impact on student's graduation chances provides additional insight into the process and impact of student disengagement at the start of the middle grades. Nineteen percent of the sixth graders had multiple flags. The odds that a student will graduate decline precipitously with each additional flag that they possess. Specifically, 56% of the zero-flag students graduate within 1 year of their expected date, but only 36% of the one-flag students, 21% of the two-flag students, 13% of the three-flag students, and 7% of the four-flag students. Table 2 shows the number of students with different combinations of flags. Some combinations are quite common, whereas others are quite rare. Of the 5,772 students who had at least one of the flags, only 10% ($367 + 142 + 95$) had both the poor attendance and unsatisfactory behavior flags. Likewise only 8% ($93 + 307 + 75$) of the flagged students failed both math and English. Just 16% of the flagged students had more than two flags. This indicates that in the main, the sixth graders in our study had a single or two off-path flags, with most common combinations being either failing math or English in conjunction with either poor attendance or misbehavior.

The academically successful and engaged comparison group. As a final check on the validity our high-yield predictors, we created a comparison group of students who

exhibited behaviors consistent with engagement and accomplishments that might sustain a positive self-confirming cycle supportive of continued engagement. We wanted to see if these behaviors and accomplishments served as protective factors that increased students' odds of graduation. In other words, if being behaviorally disengaged and failing courses during the sixth grade seriously diminishes the chances that a student will graduate, does being behaviorally engaged in schooling and academically successful substantially enhance the odds of graduating? We called this comparison group successful and engaged students, defined as those who were enrolled in 1996–97 as sixth graders in Philadelphia public schools, attended school 90% or more of the time, passed math and English, had no final poor behavior marks, and scored 1,275 or higher on the reading section of the PSSA and 1,312 or higher on the math section of the PSSA in the spring of fifth grade. These cut scores were chosen as the scaled score equivalent of the current “proficiency floor” for Pennsylvania, where a school achieves Adequate Yearly Progress via proportion of its student population scoring at or above proficient. Only 7% of the students met our criteria for being considered successful and engaged sixth graders: students who entered the middle grades with proficient academic skills and who come every day, behave, and pass their courses. Examining these students' graduation outcomes shows us how successful and engaged students fare in the school district of Philadelphia. These sixth graders have a 71% graduation rate (on time or 1 year late) from the school system. This contrasts with the district's overall rate for 1996–97 sixth graders of 43%, its 56% rate for students with none of the high-yield flags, and its 29% rate for flagged students.

Lessons Learned From This Search for Early Warning Flags

We were able to find four flags with a very high predictive yield that identify the majority of sixth graders who fall off the path to graduation. These variables, moreover—poor attendance, poor behavior marks, failing math, or failing English—each are readily and commonly measured by schools and collectively capture a significant portion of a district's future dropouts. Our results also confirm and extend prior findings suggesting that students who do not graduate do so in different but identifiable ways. In the sixth grade, by far the most common occurrence was for students to have either a single risk factor, especially poor behavior or poor attendance, or two risk factors, especially poor behavior plus course failure in English or mathematics. We can regard these findings as hopeful because they indicate that, in sixth grade, most students who can be identified at high risk for failing to graduate are only demonstrating difficulty in one academic subject and/or in one behavioral realm rather than having difficulties in many areas as is typical of many struggling high school students (Neild & Balfanz, 2006a). On the other hand,

the data also indicate that significant numbers of students are falling off the graduation path in the sixth grade and that schools may need to provide different types of supports for different sets of students during the entry year of the middle grades.

Balfanz and Boccanfuso (2007) pursued one natural extension of the research presented here in asking the question, “Is the 6th grade year really the best year to examine these risk factors?” (p. 8). Using data from an unidentified north-eastern city, they compared the impacts of off-path indicators that developed in seventh, eighth, and ninth grades with those that developed in sixth grade. Although behavioral indicators of disengagement that developed after sixth grade (such as poor attendance or course failures) were predictive of eventual dropout, they were not as strongly predictive of dropping out as were those same indicators if they were displayed in sixth grade. In addition, Balfanz and Boccanfuso found that the number of students developing off-path indicators for the first time during the seventh, eighth, or ninth grades was less than in sixth grade. The majority of students who develop off-path indicators in the middle grades do so in sixth grade.

However, the most significant finding, we believe, in the work done to date on early warning systems is that the manifestations of academic and behavioral problems that many students display at the start of the middle grades do not self-correct, at least in urban middle-grade schools that serve high-poverty populations. A common response to students who struggle in sixth grade is to wait and hope they grow out of it or adapt, to attribute early struggles to the natural commotion of early adolescence and to temporary difficulties in adapting to new organizational structures of schooling, more challenging curricula and assessment, and less personalized attention (Mac Iver, 2007). Our evidence clearly indicates that, at least in high-poverty urban schools, sixth graders who are missing 20% or more of the days, exhibiting poor behavior, or failing math or English do not recover. On the contrary, they drop out. This says that early intervention is not only productive but absolutely essential. Without it, these students will not succeed.

DESIGNING AN EFFECTIVE PREVENTION AND INTERVENTION PROGRAM TO KEEP MIDDLE-GRADE STUDENTS ON THE GRADUATION PATH

The large numbers of students who fall off the graduation path early in the middle grades clearly require substantial and sustained supports to become engaged in schooling and successfully pass their courses. The paramount influence of attendance and behavior in pushing early adolescents off the graduation path indicates something that seems apparent on face value but is often overlooked in attempts to reform low-performing middle-grade schools. Students need to attend school regularly, behave, and try to succeed in school.

In an attempt to design an effective prevention and intervention program we undertook a four-stage process. First, we used survey data for six high-poverty middle schools to examine the factors that influence behavior, attendance, and effort. Second, we examined the impact the existing TDMG model had on keeping middle-grade students on the graduation path. Third, we searched the literature for evidence of effective behavioral, attendance, and course failure interventions. Finally, we put all these elements together to develop a comprehensive prevention and intervention program that we are currently piloting in two high-poverty middle-grade schools.

What Factors Influence Attendance, Behavior, and Effort in High-Poverty Middle-Grade Schools?

To gain a better understanding of what school factors influenced student attendance, behavior, and effort, we analyzed survey items (focused on students' perceptions of mathematics and their mathematics classrooms and teachers) that we had previously collected in Philadelphia. Our survey data include observations for 2,334 fifth- to eighth-grade students from six representative high-poverty high-minority middle schools in the school district. In our previous work, we have found five major concepts predictive of student effort or academic achievement in the middle grades (e.g., Balfanz & Byrnes, 2006; Mac Iver et al., 2004): teacher support (how well students felt supported and encouraged to succeed as well as the extent to which they believed their teachers cared about them), academic press (the extent to which students felt both teachers and peers expected them to work hard and do their best), parental involvement (how often parents helped with homework and the degree to which they felt welcome in the school), utility (the extent to which students believed that the mathematics they were studying would be useful in life), and intrinsic interest (the extent to which students found mathematics classes interesting and exciting).

Using structural equation modeling analyses, we found that academic press was highly predictive of good behavior, math utility was the strongest predictor of student effort, and parental involvement and math intrinsic interest had significant effects on both students' level of effort in math class and their attendance in school (Balfanz & Byrnes, 2007). Although perceptions of support and encouragement from the math teacher did not have a significant effect on any of the student outcomes we examined, this may be because of its very high correlations with the other latent factors.

Given that different factors impact attendance, good behavior, and effort, our findings strongly support the use of comprehensive school reforms that attempt to improve student engagement through many mutually supporting mechanisms. A singular focus on any one lever can lead to some level of engagement gains, but it is only when all related factors are addressed in a systematic and integrated manner

that all the forces pushing students off the graduation path are reduced.

Impact of TDMG Comprehensive Whole-School Reform Model on Keeping Middle-Grade Students on the Path to Graduation

The TDMG model combines research-based instructional programs in the core academic subjects (mathematics, English/reading, science, and history) with extensive teacher training and support (e.g., in-classroom coaching) to enable implementation of more active and engaging pedagogies in order to make it more likely that students will remain engaged in school. It also provides targeted extra help through elective replacement mathematics and reading labs, which students take in addition to their regular mathematics and English courses. The extra-help labs are designed both to close skill and knowledge gaps and to preview upcoming classroom instruction so students are better able to understand the new material they are being taught. Evaluations of the instructional programs and extra-help labs have shown that they significantly improve student achievement when implemented with reasonable fidelity (Balfanz et al., 2006; Herlihy & Kemple, 2005; Mac Iver et al., in press). TDMG's instructional programs have also been shown to increase teacher support and peer support for learning, academic press, and students' expectancies for learning (e.g., Mac Iver et al., 2004; Wilson & Corbett, 2001). In addition, the instructional practices featured in its science program—minds-on and hands-on opportunities that include opportunities to design, carry out, and interpret experiments—have also been shown to increase students' effort and their perceptions of the intrinsic and utility value of science (Mac Iver, Young, & Washburn, 2002).

In addition to its strong instructional programs and intensive teacher support, the TDMG model also helps schools make organizational changes that increase the communal nature of schooling. Combinations of small learning communities, teacher teams, and vertical looping are used to create learning environments where students and teachers come to know and care about one another (Balfanz et al., 2002).

Given what we had learned about the predictors that indicate which middle-grade students are more likely not to graduate and how attendance, behavior, and effort are influenced by academic press, intrinsic interest, utility, and parental involvement, we surmised that the TDMG model, with its focus on effective and engaging instruction, substantial extra-help, and a communal nature of schooling, may serve as effective counter to at least some of the forces pushing students off the path to graduation. We tested our hypothesis by comparing the prevalence of warning flags displayed by the first cohort of students to experience the Talent Development reforms during all of their middle-school years in three TDMG schools with the prevalence of these flags displayed by students from three matched control schools and compared the eventual graduation rates of the TDMG and control students

(Mac Iver et al., in press). We found that middle-grade students in the TDMG schools attended school at higher rates (9% of the TDMG students vs. 18% of the control students were poor attenders), had lower course failure rates (6% of the TDMG students vs. 15% of the control students failed math; 7% of the TDMG students vs. 9% of the control students failed English) and lower misbehavior rates (36% of the TDMG students vs. 47% of the control students had unsatisfactory behavior). We also found that students in TDMG schools had significantly higher graduation rates: Across the three pairs of schools, TDMG students outgraduated control students by 11 percentage points. Furthermore, a multivariate binary logistic model controlling for race, gender, special education, and English Language Learner status found that students who attended a TDMG school for 3 years (in sixth, seventh, and eighth grades) were 55% more likely to graduate on time than were control students.

Search for Effective Interventions for Behavior and Attendance

Although the existing TDMG model has a significant impact on keeping middle-grade students on the path toward graduation, our experience working in a wide range of high-poverty middle-grade schools, as well as the analytic work on the high-yield predictors, indicated that additional interventions specifically focusing on improving behavior and attendance needed to be woven into the model so that more students in these schools maintain their school engagement. Fortunately, our search for effective interventions revealed that although the fields of attendance and behavior interventions are not well developed, particularly in the secondary grades, there are interventions with solid research bases and evidence of effectiveness (e.g., Rosenberg & Jackman, 2003; Sinclair et al., 1998; Sorrell, 2002). In both areas, a common set of strategies have been found effective. First, positive behavior and good attendance is constantly recognized, modeled, and promoted. Second, the first absence or incident of misbehavior brings a consistent response. Third, simple data collection and analysis tools are developed, which enable teachers and administrators to identify when, where, and which students misbehave or do not attend. Fourth, attendance and behavior teams composed of teachers, administrators, counselors, and sometimes parents regularly meet to analyze the data and devise solutions. Individually targeted efforts are undertaken to understand why certain students are unresponsive, continuing to misbehave or not attend despite the positive incentives and recognition. These efforts may include obtaining measures of the student's emotional and cognitive engagement in school to supplement the behavioral engagement measures included in the early warning system and thus gain a more nuanced picture of the student's overall levels of disengagement.

Effective strategies in reaching an unresponsive student typically require assigning a specific adult, usually one of the student's main teachers, with the responsibility of

shepherding the student (i.e., building a closer, more personal relationship with the student; exploring the sources of the student's disengagement from school; and checking in daily with the student and giving that student immediate feedback). If the student is a chronic poor attender, this shepherding might include calling the student each day the student is absent to communicate that the student was missed and to ask the reason for nonattendance. If the student has behavior problems, the shepherding might involve asking each of the student's teachers to complete a simple behavioral checklist and then checking at the end of the day to see how the student did. If these modest shepherding efforts do not succeed, then it is time to seek even more intensive, individualized, and clinical interventions often involving one-on-one services from helping professionals. Fortunately, simple shepherding has been found to be implementable by teachers and schools (though not without the struggles involved in implementing anything new) and has been shown to make significant impacts on improving attendance and behavior (Crone, Horner, & Hawken, 2004; Horner, Sugai, Todd, & Lewis-Palmer, 2005; Reid, 2000).

Implicit in this and explicit in the prevention literature is a three-stage model that involves (a) schoolwide reforms aimed at alleviating about 75% of the problem behaviors (including poor attendance), (b) individually targeted shepherding efforts for the 15 to 20% of students who need additional supports beyond the schoolwide reforms, and (c) intensive efforts involving specialists (counselors, social workers, etc.) for the 5 to 10% of students who need more clinical types of supports.

Next Step: Putting It All Together to Develop a Comprehensive Intervention and Prevention Plan to Keep Middle-Grade Students on the Graduation Path

Currently we are taking all that we have learned from the analytic work on the high-yield indicators, the TDMG model, and the literature on improving attendance and behavior to develop and pilot a comprehensive approach to keeping middle-grade students on the graduation path. Table 3 details the interventions we are putting in place for attendance, behavior, and course failure in the sixth grade in two high-poverty middle schools that have student bodies of mostly minority students. All of these interventions have proven to be individually effective. We need to find out their cumulative and collective impact: What percentage of students who, absent intervention, would fall of the graduation path can be kept on path through the implementation of the comprehensive set of interventions? Over the next several years, we will extend the supports to the seventh and eighth grade and then compare the number of students with a high-yield indicator (bad behavior, poor attendance, and course failure) to numbers in

TABLE 3
Comprehensive Plan for Keeping Middle-Grade Students on the Graduation Plan

Type of Intervention	Focus of Intervention		
	Attendance	Behavior	Course Failures
Schoolwide (all students)	Every absence brings a response Create culture that says attending every day matters Positive social incentives for good attendance Data tracking at teacher team level	Teach, model, expect good behavior Positive social incentives and recognition for good behavior Advisory	Research-based instructional programs In-classroom implementation support to enable active and engaging pedagogies
Targeted (15–20% of students)	2 or more unexcused absences in a month brings brief daily check by an adult Attendance Team investigates and problem solves, why isn't student attending (teacher, counselor, administrator, parent)	2 or more office referrals brings involvement of Behavior Team Simple behavior checklist brought from class to class checked each day by an adult Mentor assigned	Elective replacement extra-help courses tightly linked to core curriculum, preview upcoming lessons, fill in knowledge gaps Targeted reduced class size for students whose failure is rooted in social-emotional issues
Intensive (5–10% of students)	Sustained one-on-one attention and problem solving Bring in appropriate social service or community supports	In-depth behavioral assessment: why is student misbehaving Behavior contracts with family involvement Bring in appropriate social service or community supports	One-on-one tutoring

prior years and, more important, monitor improvements in the percentage of students staying on path to graduation.

CONCLUSION

This article argues that the nation's graduation rate crisis in high-poverty cities intensifies in the middle grades and that the challenges of the onset of adolescence; living in distressed neighborhoods; and attending chaotic, disorganized, and under-resourced schools characterized by high levels of teacher turnovers and vacancies all combine to promote student disengagement during the middle-school years. We advocate the development of practical early warning systems in every high-poverty city to identify middle-grades students who need immediate and sustained intervention to get back on the graduation path and describe the whole-school reforms and targeted interventions that are needed to help students back on path. The article draws on data from Philadelphia to illustrate that large numbers of urban students display behavioral indicators of disengagement from schooling at the start of the middle grades and that this disengagement negatively impacts their likelihood of eventually graduating from the school district. The analytic work on high-yield predictors also demonstrates the feasibility of developing an early warning system by showing that four simple factors—poor attendance, receiving a poor final behavior grade, or failing math or failing English in sixth grade—could identify 60% of the students who would ultimately fail to graduate from the school district. Combined with on-path predictor work that has recently been done in the sixth grade in other cities (e.g., Balfanz & Boccanfuso, 2007) and in the eighth and ninth

grades (Allensworth, 2005; Allensworth & Easton, 2005; Neild & Balfanz, 2006b), this work makes it clear that the vast majority of dropouts, at least in large, high-poverty urban schools, are highly identifiable and predictable before they have entered or spent much time in high school. These various studies consistently find that behavioral signs of disengagement (low attendance and misbehavior) and course failures (that both signal *and* exacerbate disengagement) are high-yield predictors of students falling off the graduation track. Further, our analysis of the factors that influence attendance, behavior, and effort; the evidence of the positive impacts of the TDMG and High School models; and the promising results of our search for effective behavioral and attendance interventions all suggest that many of these dropouts are preventable.

One limitation of this article is that we have not considered ways in which high-poverty schools may need to customize early warning systems and interventions to reflect local conditions or cultural, racial, and ethnic differences. For example, although African American and Hispanic sixth graders were equally likely to display one or more of the high-yield warning flags, 11% fewer Hispanics actually graduated from the school district of Philadelphia. These differences in the graduation rates of African Americans and Hispanics in Philadelphia (which may reflect Hispanics greater participation in the day labor market once they reach high school age) have remained relatively constant in recent years; Neild and Balfanz (2006b) found an 11% advantage on average favoring African Americans over Hispanics in the classes of 2000 through 2003.

Another limitation is our lack of explicit attention to large gender gaps favoring female students that are found

across Philadelphia's major race/ethnicity groups: Girls are less likely than boys to display each of the warning flags and outgraduate boys by 12 percentage points on average. Girls display fewer at-risk indicators and outgraduate boys in other U.S. cities too (e.g., Balfanz & Boccanfuso, 2007). To resolve the graduation rate crisis in our nation's cities by developing early warning systems, effective whole school reforms, and targeted interventions, special attention to understanding the sources of the Hispanic and gender gaps in graduation rates is warranted. We may need to tailor interventions for boys, Hispanics, and other higher risk groups if we are ever to become a society in which everyone graduates.

ACKNOWLEDGMENTS

This research was supported in part by a grant from the William Penn Foundation, by the Research on Learning and Education Program at the National Science Foundation, Grant 0411796, and by the Interagency Education Research Initiative, Grant r305w020003.

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