TOOL SET A

Calculating Freshman On-Track

Contents

Purpose

The Freshman On-Track indicator provides a clear metric for predicting high school graduation in Chicago and targeting students for intervention. Schools can set goals around this metric and monitor them on an ongoing basis.

Tool Set A contains the essential research and background knowledge on Freshman On-Track so educators can begin this work in their school or district.

How & When to Use

The comprehensive "What Matters" report from the UChicago Consortium explores the foundational research that sparked the On-Track movement in Chicago, resulting in the dramatic increase in graduation rates. The Technical Notes tool illustrates how Freshman On-Track is calculated in Chicago Public Schools. We recognize this is a Chicago-specific example. However, it can be used as a guide for establishing and communicating the On-Track metric in your school or district.

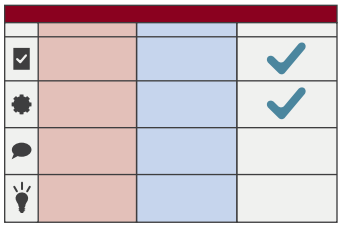
TOOL SET A

Calculating Freshman On-Track

Connections to Framework

The Freshman Success Framework is the foundation for effective school practice on On-Track and student success. The Network for College Success has seen the greatest and most sustainable gains for freshmen when schools develop high-functioning educator professional learning communities, which we call Success Teams.

This Tool Set focuses on the below actions of a Success Team stemming from the Freshman Success Framework.



Elements	Success Team
Setting Conditions	• With principal and Team Lead, establishes foundational knowledge, sets purpose, and creates freshman success goals for On-Track and student connection
Implementation	• Reviews actionable student-level data in order to provide appropriate support

This Tool Set also highlights the actions stemming from the Framework for the Principal and Team Lead in support of the Success Team work.

Team Lead

- Setting Conditions: Acquires foundational knowledge on the importance of freshman course performance as well as tools and strategies to lead the Success Team
- Implementation: Works with data technician to bring actionable student-level data at regular intervals

Principal

- Setting Conditions: Selects, programs, sets purpose, and provides foundational knowledge on freshman success work for core set of grade-level teachers
- Implementation: Provides professional development and training opportunities on the transition to high school, data strategy, and social-emotional learning

TOOL SET
A

Calculating Freshman On-Track

What Matters for Staying On-Track and Graduating in Chicago Public High Schools

Too many students in Chicago Public Schools and nationally fail to graduate from high school. It is a problem that can sometimes feel overwhelming to address because the causes of dropout are myriad and complex. What is often lost in discussions about dropping out is the one factor that is most directly related to graduation—students' performance in their ninth grade courses. In this research report, UChicago Consortium authors Elaine M. Allensworth and John Q. Easton look into the elements of freshman course performance that predict whether students will graduate and suggest what educators can do to keep more teens in school.

Chapter 1 of the report is included in this Toolkit. For the entire report, **click here >>**

Research Report

July 2007

CONSORTIUM ON
CHICAGO SCHOOL RESEARCH
AT THE UNIVERSITY OF CHICAGO
ccsr

What Matters for Staying On-Track and Graduating in Chicago Public High Schools

A Close Look at Course Grades, Failures, and Attendance in the Freshman Year

Elaine M. Allensworth
John Q. Easton

Acknowledgements

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Introduction

Improving graduation rates and reducing dropout rates are high-priority items on the national agenda for high school reform. There is increasing recognition that a high school diploma is a minimum requirement for success in the workplace and that too few students obtain this minimum standard.[1] Yet, it is a problem that can sometimes feel overwhelming to try to manage. In part, this is because of the magnitude of the problem: nationally, nearly one-third of students do not graduate from high school.[2] Almost half the Chicago Public Schools (CPS) students fail to graduate from high school, and in some CPS high schools more students drop out than graduate.[3] These numbers underscore the urgency of addressing this issue immediately.

The dropout problem is also difficult to manage because its causes are many and complex. Research on dropping out has shown that the decision to persist in or leave school is affected by multiple contextual factors—family, school, neighborhood, peers—interacting in a cumulative way over the life course of a student.[4] This suggests a daunting task for dealing with the problem of dropout—if so many factors are involved in the decision to drop out of school, including experiences outside of school and in early grades, how can any high school effort substantially address the problem?

What is often lost in discussions about dropping out is the one factor that is most directly related to graduation—students' performance in their courses. In Chicago, we have shown that inadequate credit accumulation in the freshman year, which usually results from course failures, is highly predictive of failing to graduate four years later. Research in New York City has shown very similar connections between inadequate credit accumulation and eventual dropping out, and national data confirms this; almost all students who drop out leave school far behind in course credits.[5] As we

document here in more detail, success in high school coursework is directly tied to eventual graduation. Knowing that graduation is directly tied with course grades suggests two potential strategies for addressing dropout problems. At the very least, we can use freshman course performance to identify students at high risk of dropping out to target with support and intervention. At the most, if schools and teachers can influence the quality of students' performance in their coursework, then they have a direct lever to affect graduation rates—a lever that should simultaneously improve student achievement.

In this report, we look closely at students' performance in their coursework during their freshman year, how it is related to eventual graduation, and how personal and school factors contribute to success or failure in freshman-year courses. We show that data on course performance can be used to identify future dropouts and graduates with precision, and we compare performance indicators to discern how they might be used for nuanced targeting of students at-risk of dropping out. We examine the factors that contribute to course performance in the freshman year, showing that success in coursework is affected more by what students do while they are in high school than by their preparation for high school and backgrounds. Finally, we provide evidence that teachers and schools matter for how students perform in their courses, and that efforts to reduce dropout rates are consistent with initiatives to address low achievement.

We focus on the freshman year because our prior work, and work by others, has shown that course performance in the freshman year sets the stage for eventual graduation. This report builds on a report we released June 2005 that described and defined the "freshman on-track indicator." In that report, we showed the relationship between being on-track at the end of the freshman year and graduating from high school four and five years later. On-track students had at least ten semester credits (five full-year course credits) and no more than one semester F in a core course by the end of their first year in high school. Students who were on-track at the end of their freshman year were nearly four times more likely to graduate from high school than their classmates who were not on-track.[6]

The original on-track report provided initial evidence that we could use freshman-year course performance to precisely identify future dropouts. While it was a key validation of the on-track indicator, it left a number of unanswered questions: Why is the indicator predictive? Why are students off-track? And what might high schools themselves contribute to students' course performance? Furthermore, that report only examined whether students were making minimal progress in their freshman year, which meant whether they were earning sufficient credits to be on-track for promotion to the tenth grade. But we want students to graduate from high school ready for college and work, which means we should aim for students doing A and B quality work.[7] In this report, we pull apart a variety of indicators of freshman course performance—including students' failures, absences, and overall grades—to learn what matters for a successful freshman year.

Introduction Endnotes

1 E.g., Orfield (2004); Barton (2005); National Association of Secondary School Principles (2005).

2 Swanson (2004).

3 Allensworth (2005).

4 Rumberger (2004); Alexander, Entwisle, and Kabbani (2001).

5 Cahill, Hamilton, and Lynch (2006); National Center for Education Statistics (2007).

6 Research in Philadelphia has also shown that course performance in the eighth and ninth grades can be used to identify dropouts years before they leave school (see work by Robert Balfanz, Ruth Curran Neild, and Lisa Herzog). For example, using detailed records on students, Neild and Balfanz (2005) used attendance and failure in the eighth and ninth grades to identify dropouts in Philadelphia. As in Chicago, they found that test scores were not as predictive of graduation as students' performance in their coursework.

7 As documented in the CCSR report, *From high school to the future: A first look at CPS graduates' college enrollment, college preparation, and graduation from four-year colleges*, students with a GPA lower than a 2.0 are unlikely to enroll in college, and those with a GPA lower than 3.0 are unlikely to obtain a four-year degree. Grades are also very predictive of future earnings (Miller, 1998).

Chapter 1

A Close Look at Course Grades, Failures, and Absences in the Freshman Year

As a measure of minimally adequate performance, the on-track indicator groups together marginally successful students and very successful ones. Knowing that the on- and off-track groups both contain students with widely differing course performances, we decided to explore what aspects of being off-track made students less likely to graduate, and if more nuanced indicators of course performance—such as number of course failures, GPA, or absences—might be better predictors of eventual graduation. We begin this chapter by examining these other indicators of course performance as predictors of graduation. We then use the other indicators to look more closely at what it means to be off-track.

A Number of Freshman-Year Indicators Can Be Used to Predict High School Graduation

The on-track indicator is highly predictive of graduation, but it is a blunt indicator; and the requisite data to construct the indicator are not available until the end of a student's first year in high school. Schools and districts often ask if there are other indicators that could be used to forecast graduation. In fact, there are several related measures of how well students do during their freshman year that are equally predictive and more readily available, including freshman-year GPA, the number of semester course failures, and freshman-year absences.

Freshman Course Performance Among CPS Students

This report analyzes several different, but related, indicators of freshman-year performance. Each is defined below, along with summary figures that show the performance of first-time ninth-graders in the 2004–05 school year (24,894 students). We include only students who remained in school through spring of their freshman year.

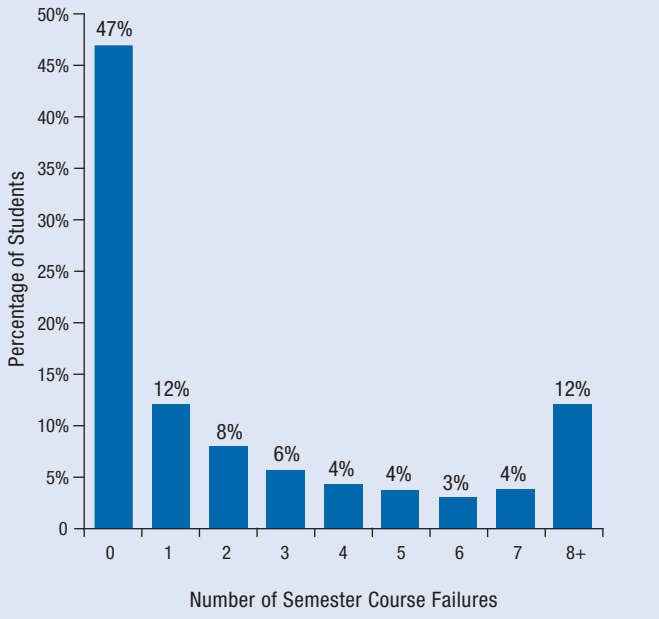
The 2005 report on the on-track indicator showed that freshman-year course performance has improved over the last decade in CPS; on-track rates improved from 50 percent with the 1994–95 freshman class to 60 percent with the 2003–04 class (excluding first-year dropouts), while freshman-course pass rates improved from 76 to 81 percent over the same period.[A] However, as detailed below, one cannot escape the conclusion that, in general, freshmen in CPS still do very poorly; more than half of freshmen fail a course, the average GPA is below a C, and absence rates are very high—40 percent of freshmen miss more than four weeks of school (including class cutting). The statistics would sound even worse if we included freshmen dropouts in the calculations. For many students, freshman year is like a bottleneck—their performance is so poor that they are unable to recover. These negative experiences in freshman year put students at high risk of not graduating, which later prevents them from participating in the mainstream economy and larger society. We cannot hope to substantially improve graduation rates unless we substantially improve students' course performance in their freshman year.

On-Track: A student is considered on-track if he or she has accumulated five full credits (ten semester credits) and has no more than one semester F in a core subject (English, math, science, or social science) by the end of the first year in high school. This is an indicator of the minimal expected level of performance. Students in CPS need 24 credits to graduate from high school, so a student with only 5 credits at the end of freshman year will need to pass courses at a faster rate in later years. The definition is aligned with the CPS promotion policy for moving from freshman to sophomore year, which only requires five full credits. In the 2004–05 freshman class, 59 percent of first-time high school students were on-track while 41 percent were off-track (excluding students who dropped out before the end of their first year in high school).

Number of Semester Course Failures: In this report, we measure failures across all courses by semester. This differs from the on-track indicator, which only incorporates failures in core subjects (reading, math, science, and social science); this report examines overall course performance, not just performance in core courses. A typical student takes 7 courses each semester; thus, a typical student could fail as many as 14 courses in a year. Figure 1 graphs the number of semester courses failed by first-time freshmen in the 2004–05 school year, excluding students who dropped out before the end of their first year in high school. The modal category of failures is 0; however, more than half the CPS freshmen (53 percent) fail at least one course.

FIGURE 1

Number of Course Failures Among Freshmen in 2004-05



Grade Point Average (GPA): CPS students receive a weighted GPA on their report card, which gives extra points for grades in honors and Advanced Placement (AP) courses. In this report, we analyze unweighted GPAs (which use values of 4 points for an A, 3 for a B, 2 for a C, 1 for a D, and 0 for an F) for all credit-bearing classes. We analyze unweighted GPAs rather than weighted GPAs because all students do not have equal access to honors, International Baccalaureate (IB), and AP courses. Figure 2 shows the distribution of GPAs among first-time freshmen in 2004–05, for students who remained in school through spring term. A 2.0 GPA (C average) is typical for CPS freshmen. Very few students—only 3 percent—have A averages their freshman year, while more than 40 percent of freshmen finish the year with a GPA lower than 2.0 (a D+ average or lower). About a quarter of students have a B or higher average at the end of their freshman year.

Course Absences: Absences are counted on a course-by-course basis and then aggregated into total number of days absent. If a student misses one out of seven courses in a day, it counts as one-seventh of a day of absence for that student. Figure 3 shows absence rates for students entering CPS high schools in the 2004–05 school year, excluding students who dropped out before the end of their first year in high school. One-quarter of students missed less than one week of school per semester. Forty percent of students missed more than two weeks of school per semester, which is a month or more of class time per year. There are 90 days in each semester, so these students missed more than 10 percent of the annual instructional time. Students can be counted as truant with 20 unexcused full-day absences.

FIGURE 2

Distribution of Freshmen GPAs in 2004-05

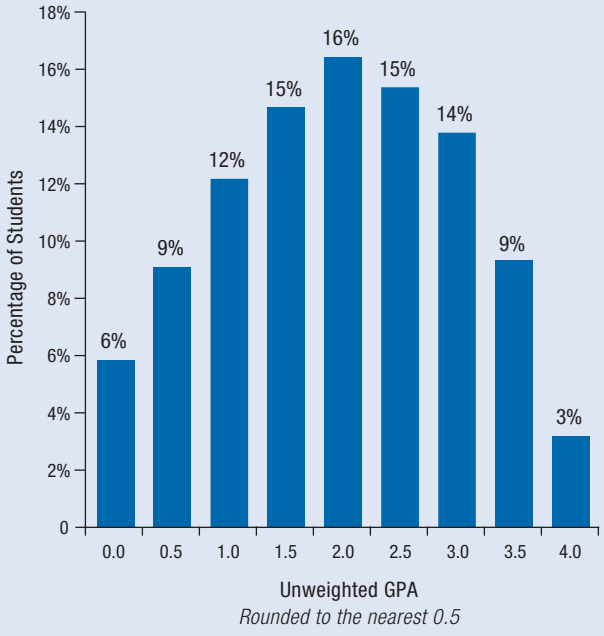
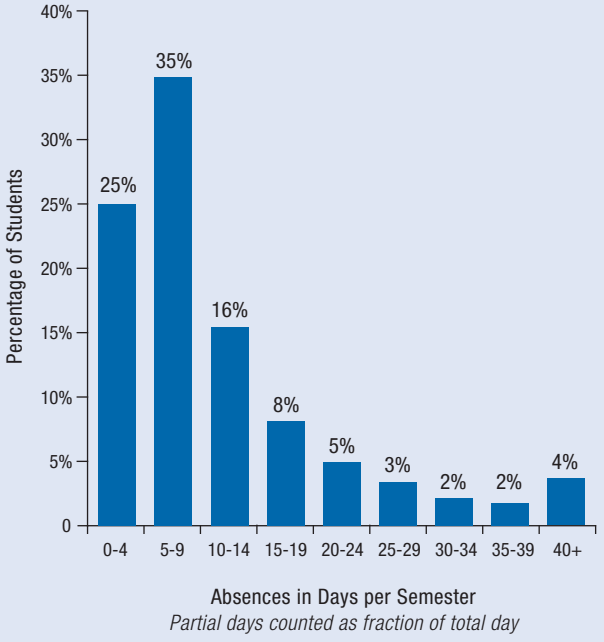


FIGURE 3

Absences Among Freshmen in 2004-05



Sidebar Endnotes

A Allensworth and Easton (2005).

Table 1 shows how well each of the four indicators of freshman-year course performance predicts whether students will graduate from high school within four years. Whether a student is on-track, GPA, and the number of semester course failures all correctly identify graduates and nongraduates 80 percent of the time. GPA is the most accurate for identifying nongraduates. Freshman-year absences are slightly less predictive than the other three indicators because they do not distinguish students who are attending school but performing poorly in their classes from those who are attending and performing well. Although the four indicators of course performance may seem somewhat interchangeable, they each provide somewhat different information, as described below.

TABLE 1

Predictive Ability of Indicators of Freshman-Year Performance

Freshman Performance Indicator	Overall Correct Prediction	Specificity *Predicting Nongraduates*	Sensitivity *Predicting Graduates*
GPA	80%	73%	85%
On-Track vs. Off-Track	80%	72%	85%
Semester Course Failures	80%	66%	89%
Fall-semester failures	*76%*	*55%*	*91%*
Absences	77%	59%	90%
Fall-semester absences	*74%*	*53%*	*89%*

In the earlier report, we showed that students on-track at the end of their freshman year are about four times more likely to graduate than off-track students (see Figure 4). The on-track indicator has advantages over the other indicators in terms of ease of reporting and being easily understood by a broad public. Because it is a categorical variable with only two values—either on- or off-track—it is easy to report trends over time. However, the on-track indicator does not provide information that is precise enough to allow specific students to be targeted for specific interventions. In addition, the indicator does not provide timely information to schools: it cannot be calculated until the summer after students' first year of high school.

Several researchers have found that high absence rates are strong predictors of dropping out.[1] In CPS, about 15 percent of first-time freshmen have extremely high absence rates, missing one month or more of classes each semester (see Figure 3). These students have largely disengaged from school—they remain enrolled, but have marginal attendance—and they have less than a 10 percent chance of graduating (see Figure 5). However, it is not just extremely low attendance that is problematic. *Even moderate levels of absences are a cause for concern.* Just one to two weeks of absence per semester, which are typical for CPS freshmen, are associated with a substantially reduced probability of graduating. In the 2000–01 cohort, only 63 percent of students who missed about one week (five to nine days) graduated in four years, compared to 87 percent of those who missed less than one week. This is of great concern, considering that only one-quarter of CPS freshmen miss less than one week of school per semester. Attendance is clearly a vital part of graduating from high school, but beyond this we show evidence later in this report that attendance is the most essential requirement for avoiding course failure.

Information on absences is available early in the school year and might be the most practical indicator for identifying students for early interventions. More than half the nongraduates can be identified by the end of the first semester using either absence or failure rates. By the end of the first term, course grades and failure rates are slightly better predictors of graduation than attendance because they directly indicate whether students are making progress in their courses. These rates also provide more specific information to target programs for struggling students than the on-track indicator. GPA, in particular, provides information about who is likely to struggle in later years and is the best indicator for predicting nongraduates.[2] As shown in Figure 6, students with a 2.5 GPA (C+ average) in their freshman year have a very high likelihood of graduating within four years—86 percent did so in the 2000–01 freshman cohort. As grades fall between 2.0 (C average) and 0.5 (D- average), graduation rates fall dramatically. Just under three-fourths of students with a 2.0 (C average) graduated by 2004 in the 2000–01 cohort, compared to about one-quarter of students with a 1.0 (D average). Virtually no student with an average lower than a D in the freshman year earned a CPS diploma; this is a cause for concern, given that 15

FIGURE 4

Four-Year Graduation Rates by Freshman On-Track Status

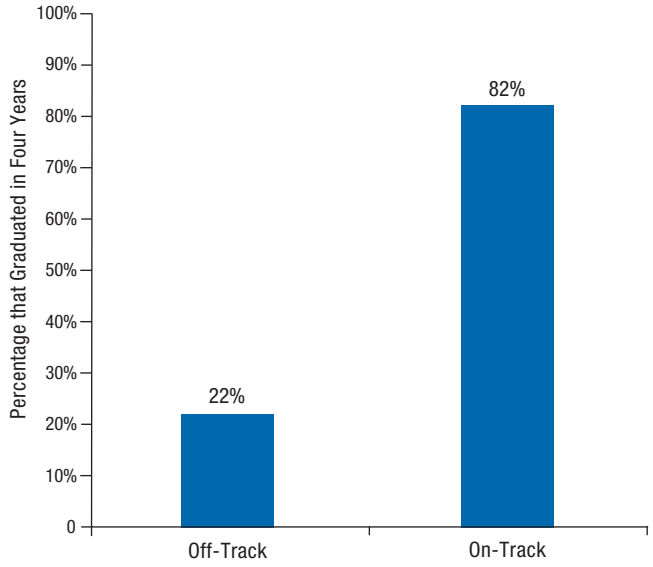


FIGURE 5

Four-Year Graduation Rates by Freshman Absence Rates

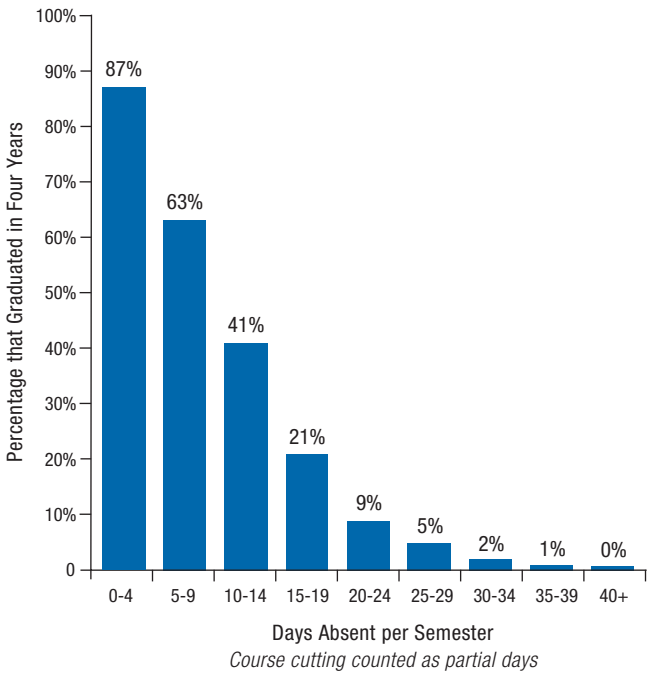


FIGURE 6

Four-Year Graduation Rates by Freshman GPA

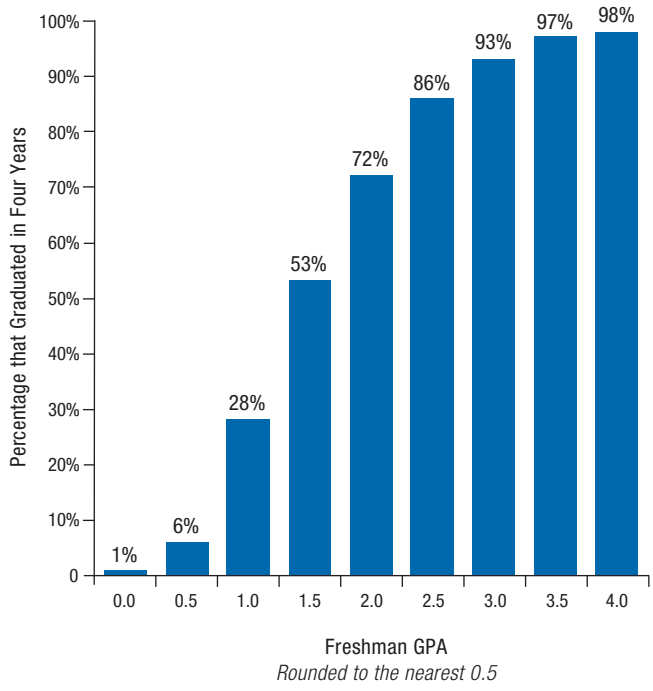
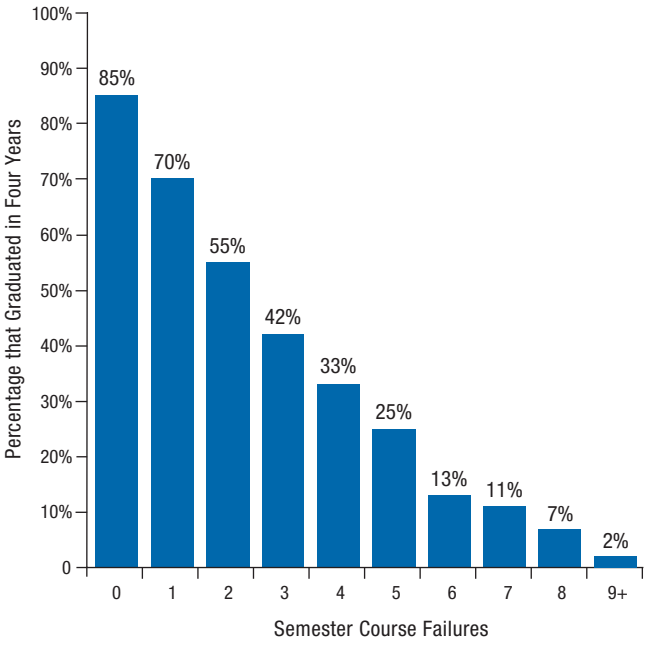


FIGURE 7

Four-Year Graduation Rates by Freshman Course Failures



Graduation rates are based on students entering high school in September 2001, followed until September 2005 for Figures 4-7.

percent of CPS students finished their freshman year with lower than a D average (see Figure 2).

On the other hand, students with good grades in their first year are very likely to be successful in their remaining years of high school. In the 2000–01 entering class, *almost all students with a B average or higher at the end of their freshman year graduated within four years.* Furthermore, almost 80 percent of these students graduated with a final GPA of 3.0 or higher. We know from research that the decision to drop out is affected by myriad factors in students' lives, many of which exist outside of the school.[3] It is probable that first-year students who earned high grades experienced fewer outside stressors than other students, and fewer personal and home problems undoubtedly made graduating from high school easier for them. However, it is also likely that many of the students who received good grades their freshman year also struggled with problems outside of school sometime during their four years of high school. Remember from Figure 2 that almost a quarter of CPS freshmen have B or higher averages in a district that is about 90 percent low income—thus, most students with B or higher averages are low-income students. Still, 95 percent of the students with B or higher averages graduated within four years.[4] Success in the freshman year may make it easier for students to continue, despite personal and family problems that might develop during the course of high school.

Clearly, GPAs are related to course failures because failures are part of the calculation of students' GPAs. Course failures are more directly tied to graduation, however, because students need to accumulate a specific number of course credits to receive a diploma, and they must pass their classes to obtain credits. This is

Students' Freshman-Year Course Performance Is Much More Important for Graduation Than Their Background Characteristics and Prior Achievement

Students' likelihood of graduation is affected by their educational experiences prior to high school, and is related to their economic and demographic backgrounds.[A] Research on graduation has shown particularly strong relationships of graduation with students' test scores and age on entry into high school—which is a proxy for grade retention. Graduation is also related to students' gender, race, and economic status. However, all of these factors together explain only about 12 percent of the variation in graduation rates in the cohort of students entering CPS high schools in the 2000–01 school year.[B] In contrast, students' freshman-year GPA and number of Fs explain 39 percent of the variation in graduation rates.[C] Once we know how students performed in their classes in their freshman year, additional information about their backgrounds does little to improve our prediction of whether they will graduate. [D] As we showed in Table 1, ninth-grade Fs or GPA each can be used to predict about 80 percent of graduates; if we include information about students' background characteristics and prior achievement, we only improve the prediction by about half a percentage point.[E]

Sidebar Endnotes

A E.g., Rumberger (2004); and Alexander, Entwisle, and Kabbani (2001).

B This is the reduction in log-likelihood (pseudo-R^2) that is achieved by predicting graduation with students' eighth-grade test scores, age, race, gender, poverty, and economic status with a logistic regression model.

C The variance explained increases from 12 to 40 percent if indicators of freshman course performance are included in the models described in the previous footnote.

D Background characteristics explain only an additional 1 percent more variation in graduation rates than do freshmen Fs and GPA alone.

E These statistics on variance explained in dropout are similar, albeit slightly smaller, to those reported by Alexander, Entwisle, and Kabbani (2001) in their comprehensive study of factors across the life-course that contribute to graduation/dropout. They reported that ninth-grade performance, behaviors, and attitudes (GPA, grade retention, parent attitudes, pupil behaviors, and pupil attitudes) together explained 44.1 percent of the variation in dropout rates; when they added in background factors, the variation explained increased by just under 6 percent (to 49.8 percent).

reflected in the consistent relationship between the number of courses a student fails and whether that student eventually graduates, as shown in Figure 7. Each additional course failure makes it more difficult to graduate.[5] Once students have failed six semester courses (i.e., three full-year courses), they are so unlikely to graduate that additional failures only modestly decrease the probability of graduating; these students have failed half their courses or more.[6]

Because each indicator has different advantages, an effective monitoring system could be created to take advantage of each indicator at different points in the school year. For example, because absence rates are known early in the school year, schools could address poor course attendance within the first quarter. After students' first-quarter grades are known, students with failure warnings should receive immediate supports. When semester grades are posted, those students with failures will need a strategy for making up missing credits. At the end of the school year, students' grades could be used to identify students at high risk of future failure and to identify students performing below their potential (e.g., students with high test scores but low grades). On-track rates for the cohort could be determined in the summer after the school year as a simple indicator to evaluate school programs and policies, and to identify particular groups of students with nonpromotion rates that are especially high.

Course Failure Is a Sign that Students Are Generally Struggling in School

Students can be off-track just by failing one yearlong course (two semester courses). After writing the last report, we wondered about the extent to which students were thrown off-track by an aberrant course failure. We also wondered if course failure was as detrimental to graduation among students who were generally doing well in their other courses as it was for students who were struggling across all of their courses. To gain a better understanding of the variability in the course performance of on- and off-track students, and what that variability means for graduation, we examine on- and off-track performance by students' failures and their grades in the courses they passed.

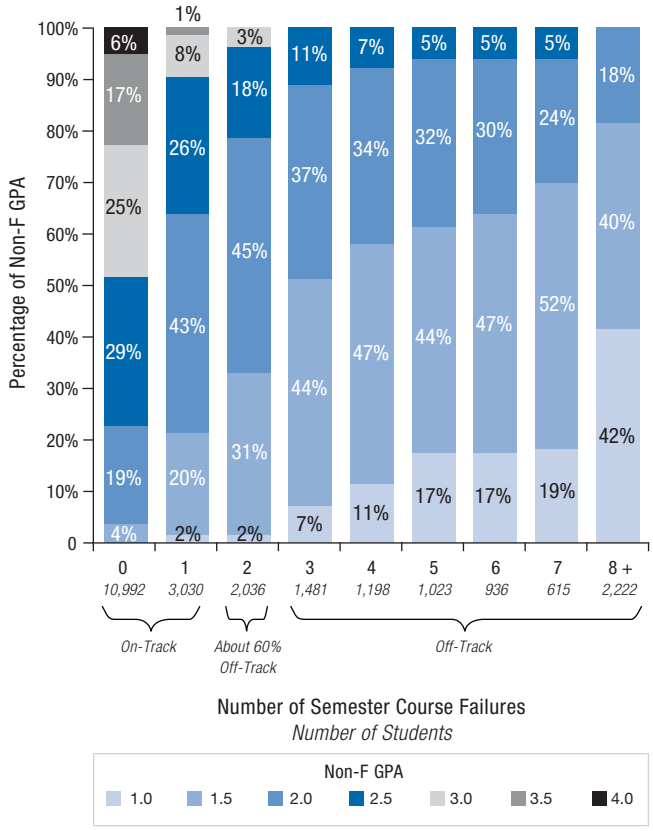
In general, off-track students are struggling in all of their courses. Figure 8 shows the distribution of GPAs in passed courses by the number of semester course failures. Even on-track students have relatively low GPAs. Among students with no failures, the typical GPA is about 2.5 (C+). Only half (48 percent) has a GPA of a B or higher; 23 percent are C or D+. Among students with only one semester F, who are also on-track by our definition, over 90 percent have a GPA lower than 3.0 (B average) in the courses that they pass. More than three-fourths of students who fail just one full-year course have grades averaging 2.0 or lower (C or lower) in the classes they pass. Almost all off-track students who fail two or more semester courses have GPAs of 2.0 or lower in the classes they pass. It is most typical for off-track students to have a GPA of 1.5 (D+ average) in the courses they pass.

Few students experience isolated problems and perform well in other coursework. Failure in even one semester course is generally a sign of trouble in other courses. This suggests that problems or successes in one class may generalize to other classes. For example, a student who skips one class may fail to show up to subsequent classes that day. Likewise, success in one class may lead a student to put forth more effort in other classes. Of course, performance in all courses will be affected by factors such as students' background and preparation, and by the overall instructional climate of the school.

The strong connection between grades overall and failures in a few classes has implications for how we think about high school reform strategies. *Instead of being isolated, problems with course failure tend to indicate broader problems of academic performance.* This suggests that strategies that address particular courses (e.g., math remediation or tutoring) might be limited in their ability to affect broader outcomes, compared to more comprehensive strategies (e.g., instructional coordination across classes or schoolwide attendance initiatives). This also suggests problems of course failures, dropping out, and low achievement should be addressed by coordinated strategies. These issues are discussed further as we explore the school factors associated with freshman-year course performance.

FIGURE 8

Grades in Passed Courses by Number of Course Failures



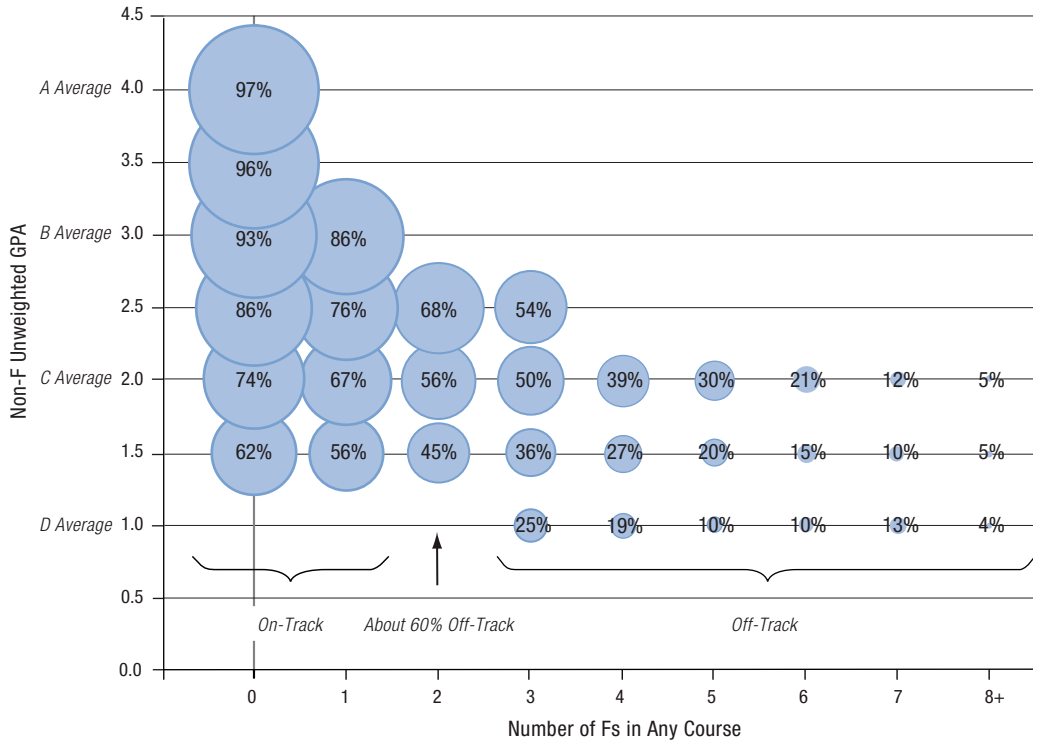
Overall Grades, as Well as Failures, Matter for Graduation

Course failures and overall GPA are strongly related. However, among students with the same number of Fs, higher grades in other courses increase the likelihood of graduation. Figure 9 shows graduation rates classified by the number of Fs and GPA in the courses that students passed. Each column represents students with the same number of freshman-year failures. Among students with the same number of failures, those who had higher grades in the courses they passed were much more likely to graduate. Even students with no failures in their first year of high school were at some risk of not graduating if they had a C average or lower. It is likely that poor grades in the freshman year foreshadow problems with course failure in later years. Students who just barely pass their freshman classes are likely to struggle as they move into their sophomore year.

Course grades predict the likelihood of graduating, but course failures have a direct effect on graduation beyond their relationship with students' overall grades. Ultimately, students need course credits to

FIGURE 9

Graduation Rates by number of Fs and GPA in Passed Courses



How to Read this Chart:

The size of the bubbles indicates the four-year graduation rate of students entering high school in the 2000-01 school year by their freshman year course failures and grades in the classes they passed. Students who passed all of their courses in their first year of high school are in the first column. Their graduation rates ranged from 62 percent among students with a 1.5 GPA to 97 percent for students with a 4.0. Among students who failed two semester classes their freshman year, graduation rates ranged from 45 percent among students who received a mix of Cs and Ds in the classes they passed (averaging 1.5 points) to 56 percent for students with all Cs in the classes they passed (2.0 average), up to 68 percent for students with a mix of Cs and Bs (2.5 average) in the courses they passed.

graduate; and failures have a direct effect on the probability of graduating. As shown in Figure 9, the probability of graduating declines quickly with each additional course failure.[7] This can be seen more clearly in Figure 10, which shows graduation rates by freshman GPA for both on- and off-track students. All students with very low freshman GPAs are off-track (see far left of graph), and nearly all students with high GPAs are on-track (see far right of graph). But in the middle range, GPAs from 1.0 to 2.5 (D to C+), students can be either on- or off-track depending on how many Fs they have. For students in this middle range, about 60 percent of students, having failed more than one semester course has a strong impact on the likelihood of graduating. Among students with the same overall GPA, on-track students are about 9 percentage points more likely to graduate than off-track students with the same GPA. This occurs even though off-track students must have had higher grades in their passed courses than students with the same overall GPA who are on-track.

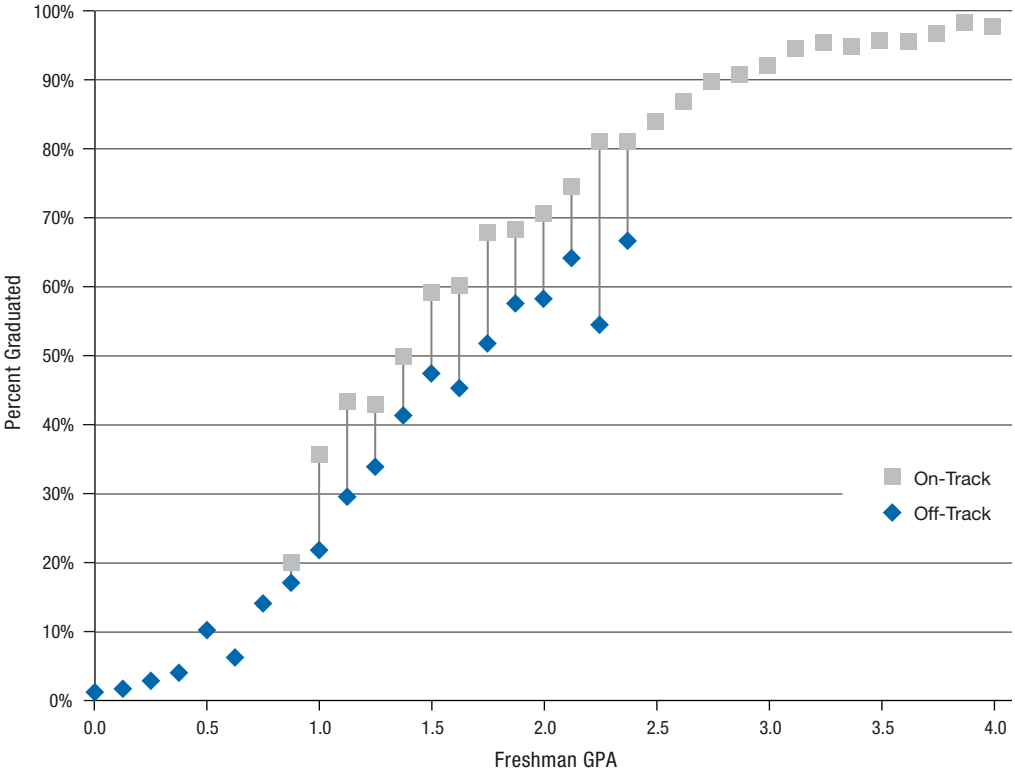
Intervention Efforts Are Needed for More Than Just the Lowest-Performing Students

Students with high rates of course failure are extremely unlikely to graduate. Those who fail four or more semester courses (i.e., two courses in each semester), or who hold lower than a D average, probably need very intensive assistance in order to graduate; and schools may be disappointed with the effects of programs that are not sufficiently comprehensive. On the other hand, students with GPAs in the D+ or C- range, or just one failure in the first semester (two semester failures for the year), are about as likely to graduate as not to graduate. Because students in this GPA range constitute a large percentage of students and they have a reasonable chance of graduating, efforts to support these students could have a substantial payoff for school graduation rates. However, because such students are not the lowest performers, these students may not be seen as in great need of support.

To gauge the degree to which graduation rates might be affected by a targeted effort to increase passing

FIGURE 10

Percentage of Students Who Graduated in Four Years by Freshman GPA and On-Track Status



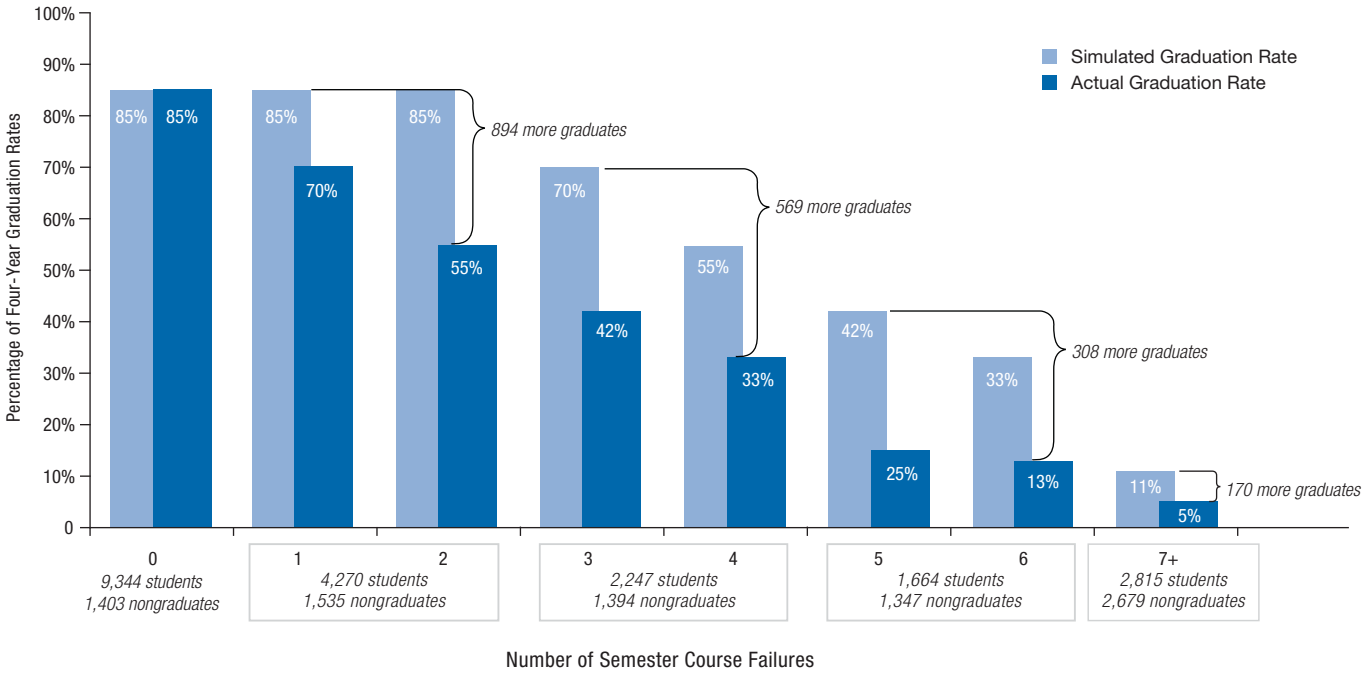
Almost all students with GPAs below 1.0 are off-track, while almost all students with GPAs above 2.5 are on-track. Students with GPAs of 1.0 to 2.5 may be either on- or off-track. The gray lines show the difference in graduation rates for students with the same GPAs by on-track status. Students who are off-track must have had higher grades in the courses they passed than on-track students with the same GPA, yet they are about 9 percentage points less likely to graduate.

rates, Figure 11 simulates the maximum improvements in graduation rates that could be expected if schools could find a way to get each student to pass two additional semester courses (one full-year course) in their freshman year. This could be considered a summer school recovery effect, since students can take a full-year course over the summer, or a potential effect of increasing academic supports in the school year. To estimate the effect, we simply assign each student the graduation rate observed among students who had two fewer failures than that student. This is an overestimation of potential graduation rates, because we do not consider other factors that are associated with failure that influence graduation. However, it allows us to gauge the relative effects of improvements in pass rates on different groups of students.

The bottom of Figure 11 shows that about half the students who entered CPS high schools in 2000–01 and failed to graduate four years later received multiple Fs in their freshman year: 2,679 students who failed to graduate had seven or more semester Fs in their freshman year, and an additional 1,347 students who failed to graduate had five or six semester Fs. Thus, this may seem like a reasonable group to target for recovery efforts or tutoring. However, improving pass rates among these students by two semester courses would do little to affect overall graduation rates—their probability of graduating is so small that they would still be unlikely to graduate with an additional two course credits. We might expect as many as 170 additional graduates among students with seven or more semester failures (a 1 percentage point increase in the total graduation rate), and as many as 308 more graduates among students with five or six semester course failures (a 2 percentage point increase in the total graduation rate). Students with many course failures will need more support than tutoring or summer school to have a reasonable chance of graduating—all of these students

FIGURE 11

Estimated Improvements in Systemwide Graduation Rates if Each Student Passed Two Additional Semester Courses*



**Graduation rates for students failing fewer than two courses are estimated as if they failed no courses. This simulation suggests the maximum degree to which graduation rates could be expected to improve if each student failed two fewer courses or recovered two courses immediately after failure. It is an overestimation because it does not take into account factors other than Fs that affect graduation (e.g., grades in passed courses tend to be lower among students with more Fs). However, it can be used to gauge the relative effects of recovery or improvements in pass rates for students with different rates of failure. While students with multiple Fs comprise the majority of nongraduates, small improvements in pass rates or recovery among these students would have a much smaller effect on graduation rates than similar efforts among students who have failed only one or two courses. These figures are based on students in the 2000-01 freshman cohort.*

How We Obtained Information on Students and Schools

The analyses in this report are based on two cohorts of students. The statistics that show freshman course performance without any reference to graduation rates or survey data are based on all freshmen who entered CPS high schools in fall 2004 who did not attend charter schools (24,894 students). Statistics that tie freshman course performance to graduation rates are based on all students who entered CPS high schools in fall 2000 who did not transfer out of CPS before September 2004 and who did not attend a charter school (20,803 students).[A] Statistics that use survey data only include those students from the 2004–05 cohort who participated in the spring 2005 surveys (14,045 students) described below.

Data on students' course absences and grades come from semester-by-semester grade files provided by the Chicago Public Schools (CPS). Data on grades and absences are provided separately for each course taken by each student each semester. All CPS schools, except charter schools, provide this information. For this reason, charter school students cannot be included in any of the analyses in this report.

Data on students' background characteristics and school demographics come from student administrative records and test score files provided by CPS. Gender, race, and age are part of the administrative record files. Mobility, which is calculated from longitudinal administrative records on individual students, is measured as the number of times a student changed schools in the three years prior to high school. Eighth-grade achievement is measured with students' scores in the reading and math sections of the Iowa Tests of Basic Skills (ITBS).

Students' socioeconomic status is measured through two variables, which were constructed from the 2000 U.S. census data, regarding the economic conditions in students' residential block groups. The first, concentration of poverty, is constructed from information on the male unemployment rate and the percentage of families living below the poverty line. The second, social status, is constructed from information about average income and education levels. These indicators allow for much more discrimination in socioeconomic background than the simple indicator of free/reduced lunch, for which about 90 percent of CPS students are eligible.

Measures of school climate come from surveys conducted by the Consortium on Chicago School Research (CCSR) in spring 2005. Nearly 130,000 students, teachers, and principals across the system participated. Our surveys ask about learning climate, teacher-student relationships, leadership, and quality of the school's instructional program. They also ask about the school's professional environment, and the nature of the school's relationships with parents and the community. From these surveys we create measures about features of each school.[B] Students' perceptions of climate are constructed from responses of ninth- and tenth-grade students. Teachers' perceptions are constructed from responses of teachers at all grade levels.

Unfortunately, the data do not allow us to discern individual students' specific experiences on a class-by-class basis. For each measure, students either reported on just one of their courses (English or math) or on the school as a whole. We can aggregate the data from all students to create measures of climate across the school, and classroom climate across English and math classes in the school, but we cannot distinguish different patterns of experience within the school among different students. Still, these measures of the average climate in schools provide some evidence about what matters for course performance, although we would expect to find stronger relationships if we could map out different experiences within schools.

Sidebar Endnotes

A Students who left for involuntary reasons (incarceration, institutionalization, death) are excluded from analyses, along with those who transferred out of CPS.

B For more information on our surveys and on the psychometric properties of our measures, visit the CCSR Web site at ccsr.uchicago.edu.

need to pass *at least* four additional semester courses to be on-track, and many need much more. Modest efforts to support these students will not be sufficient to have a sizable impact on graduation rates.

On the other hand, summer school and tutoring that is targeted at students with small numbers of course failures could potentially have a sizable effect on graduation rates. If students who failed just one or two semester classes were to pass those classes instead of failing them, we might expect as many as 894 additional graduates. If students who failed just three to four semester classes (up to two full-year classes) were to pass an additional two semester classes (one full-year class), we might expect an additional 569 more graduates. Together, this is a 7 percentage point increase in the overall graduation rate. It is also likely easier to improve pass rates among students with few Fs than among students with multiple failures.

Chapter 1 Endnotes

1 E.g., Balfanz and Neild (2006); Alexander, Entwisle, and Horsey (1997).

2 In fact, 86 percent of nongraduates can be identified with freshman GPA by sacrificing specificity to 68 percent.

3 Rumberger (2004a); and Alexander, Entwisle, and Kabbani (2001).

4 Ninety-five percent of these students graduated within four years, and only 3 percent dropped out. The remaining 2 percent remained for a fifth year of high school.

5 Besides preventing credit accumulation, failure may also impede graduation through indirect mechanisms. For example, failure may demoralize students and lower their expectations. Failure may also disrupt students' schedules when they need to repeat a failed class. Often students progress to classes that build on knowledge that should have been learned previously, thus a failure can indicate that a student is unlikely to succeed in a future class. For example, most CPS students who fail algebra in their freshman year take geometry in their sophomore year before passing algebra.

6 Most students take seven courses in their first year of high school.

7 Each additional course failure decreases the probability of graduating by about the same amount as a decrease of half of a grade point across all classes.

TOOL SET A

Calculating Freshman On-Track

Technical Notes for Freshman On-Track

This document was created by Chicago Public Schools to define how Freshman On-Track is calculated and provides considerations for appropriate use of the metric. The Network for College Success has edited this document to remove out-of-date references.

Technical Notes for Freshman On-Track

What is Freshman On-Track?

Freshman On-Track (FOT) is a measure of how many first-time freshmen are, by the end of their first year, "On Track" to graduate from high school within four years. The measure is based on two freshman year data points: (i) credit accumulation; (ii) course failures. An eligible first-year freshman is On Track by the end of the year if s/he has: (i) earned at least five course credits; (ii) failed *no more than* one semester of a *core* course—otherwise, s/he is off track. UChicago Consortium research shows that freshmen who finish their first year of high school On Track are more than three times as likely as those off track to graduate from high school within four years.

There are a few technical points regarding FOT calculation that anyone using this data should be aware of:

- Eligible freshmen count towards the FOT rate of the school they attend *on the 20th day of school*, regardless of where they finish, or spend the majority of, the school year.
- Freshman year dropouts *are* included in the metric, and they are counted as off track.
- Freshmen attending the following types of schools (as of the 20th day) are *not* included in the metric:
  - Charter schools
  - Jail schools
  - Alternative schools
  - Special Ed schools
- Students repeating ninth grade are not included in the metric.

While attendance may impact whether a student earns the necessary amount of credits and/or passes courses, attendance *does not* directly factor into the calculation of this metric.

Components of the Freshman On-Track Metric

- Credits accumulated during first year of high school (>/= 5)
- Number of semester core course failures during first year of high school (</= 1)

How are results reported?

Annual

- ***School-level*** Freshman On-Track data for the years 1997-2016 is currently available on the CPS Performance Data website. To obtain it, go to Related Links and click on School Data. Then navigate to Metrics > Freshman On-Track.

- ***Student-level*** Freshman On-Track data—which is aggregated up to the school, area, and district levels for reporting and accountability purposes—is not available directly via website.

Point-in-time

A "point-in-time" Freshman On-Track rate—a rough approximation of end-of-year Freshman On-Track rate—is also available, on a dynamically updated basis, via the Freshman Success Report located on Dashboard. This point-in-time rate may be useful to monitor and manage school and area performance within the school year: be advised, however, that the value of this rate jumps around quite a bit during the school year, is always lower at the end than the beginning of the year, and is based on an approximation of the end-of-year FOT criteria.

What questions can Freshman On-Track data answer?

Freshman On-Track data can be used at the aggregate level—whether district, area, or school—to gauge what percentage of students are "On Track" to graduate in four years—in turn, we know that students who are On- Track after freshman year are over three times as likely as those off track to graduate in four years. In short, it helps us answer the broad question: "How good of a job is this part of the district doing making sure its freshmen have attained the education they need to graduate on time?"

Freshman On-Track data can also be cut in numerous ways to indicate how successful schools, areas, or the district as a whole have been at intervening with "at risk" students to ensure they are on pace to graduate on time. Interesting analytical questions and possible deep dives include:

- What % of students who were flagged on the beginning-of-year Freshman Watchlist (or any of the quarterly Freshman Success Reports) finished the year "On Track"?
- What kinds of "at risk" students are we most (and least) successful at getting On Track—kids with attendance problems? Academic problems? Both?
- How do different racial/demographic groups break down in terms of Freshman On-Track rates, and how (if at all) should this information inform school- and/or classroom-level FOT strategies?
- Did tailored, school-level interventions "work"?—How much more likely were "at risk" students who received particular types of intervention (e.g. tutoring, parent conferences, etc.) during their first year of high school to be "On Track" than those who did not?
- Among our off-track students, what particular classes or subject areas are causing the most semester failures? Do we have a plan to ensure that proper supports are in place to help reduce failure rates in these areas going forward?
- Among a high school's freshman student body, are there substantial variations/patterns depending on what elementary feeder school a student attended, and how should this impact our feeder school outreach strategy?
- What percentage of our *off-track* freshmen graduate within four years?—and do we have effective credit recovery programs in place to get these kids back On Track during sophomore/junior/senior year?
- What percentage of our *On-Track* freshmen graduate within four years?—and do we have effective sophomore/ junior/senior year transition programs in place to ensure that On-Track kids *stay* On Track?

What questions can Freshman On-Track data ***NOT* answer?**

- Freshman On-Track was designed to be predictive of high school graduation—NOT of either college enrollment or college success. Standardized test scores and GPAs are much better indicators of the latter.
- The Freshman On-Track rate will tell us how many of a given school's freshmen were On Track, but not how close a given student was to the FOT "cutoffs"—i.e. it will NOT tell us:
    - How many more credits/fewer failures off-track students needed to be OnTrack
    - How far beyond "On Track" baseline cutoffs On-Track students were, in terms of credit accumulation
- Without deeper analysis, FOT will not indicate *why* a student was off track, i.e. whether it was because s/he did not *attempt* enough credits, or because s/he did not *pass* enough credits.
- FOT cannot directly answer any questions about student attendance, nor does it incorporate such data.
- FOT will not tell you anything about what happens to students who have been retained, i.e. are second-time freshmen.
- Also, keep in mind that FOT rates are highly dependent on:
    - Ability level and work habits of incoming students
    - Grading policies at individual high schools

How is Freshman On-Track data used within Chicago Public Schools?

Freshman On-Track data is a key self-monitoring tool for schools, which can be used to help gauge the effectiveness of school-specific intervention and transition strategies for 9th graders.

It is also a key district accountability metric, in two ways:

1. First, the metric **% of Freshmen On-Track** appears on the districtwide annual high school scorecard, which is used to gauge progress towards district and area goals.
2. Second, FOT is a crucial component of the district's Performance Policy, which dictates whether or not a given school is on probation. Specifically, a high school can earn up to three (3) points for its current FOT level, and up to (3) points for its FOT trend—six (6) points, total.