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The Use of Ninth-Grade Early Warning Indicators to Improve Chicago Schools

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Chicago has been in the forefront of the country in its use of 9th-grade indicators of dropout. Catalyzed by the development of the freshman on-track indicator and research around it, Chicago school administrators, central office personnel, and external partners have developed a number of mechanisms using 9th-grade indicators to stimulate school improvement. This article describes 3 ways in which early warning indicators are useful for improving student achievement: (a) focusing conversations and efforts on actionable problems; (b) identifying students for intervention; and (c) using indicator patterns to address low performance in a strategic way. Examples from high schools in Chicago suggest that knowledge of the on-track indicator and its use in district accountability were not enough to change practice. However, the availability of data tools that make it easy to act on information about on-track rates have changed the ways in which teachers and school staff interact with each other, students, and parents regarding improving student performance. The strategies they have developed with the data tools have provided a systematic focus to their efforts, which appears to be paying off in substantially improved ninth-grade achievement.

Ten years ago, addressing high school dropout rates seemed like an intractable problem. Research had shown that dropping out of school was a gradual process that resulted from a large array of factors throughout students' time in school. Family history, peers, health, mobility, neighborhood crime, and resources all played a role, as well as students' academic success and engagement throughout the primary, elementary, and middle grade years (Alexander, Entwisle, & Dauber, 2003; Finn, 1989; Rumburger, 2004; Rumberger & Larson, 1998). When one looks at dropping out that way, the problem appears almost unmanageable for schools. How could a high school monitor and address these factors that are external to schools, many of which affect students well before they enter ninth grade? In fact, with so many factors feeding into students' likelihood of leaving school, it was hard to know who was even at risk of dropping out. Research highlighted the fact that intervention was difficult because it was not possible to accurately predict who was at risk (Gleason & Dynarski, 2002).

Those were the days before wide access to student-level data systems. Now that educators can track students' progress through school, they have early warning indicators that are available, highly predictive of when students begin high school, and readily available to high school practitioners. Furthermore, the factors that are most directly tied to eventual graduation are also the

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factors that are most malleable through school practices—student attendance and effort in their courses. Not only can students be identified for intervention and support, but schools can use patterns in the indicators to address structural issues that make it more difficult for students to graduate.

This article reviews some of the research that led to the development of the early warning indicator system in Chicago, and some emerging work that has examined reasons for poor course performance in ninth grade. It then describes three general mechanisms through which the indicators can drive improvements in student performance through the use of data tools designed to help practitioners be strategic about improving student performance in their schools. It provides examples of those uses in high schools in Chicago, and shows the degree to which on-track rates have improved over time.

RESEARCH IN CHICAGO ON EARLY WARNING INDICATORS

In 2005, research at the University of Chicago Consortium on Chicago School Research (CCSR) showed that a simple indicator of whether students were on track to graduate at the end of their first year in high school could correctly predict graduates with 80% accuracy (Allensworth & Easton, 2005). The on-track indicator was constructed as a simple dichotomous measure showing whether students had gained sufficient credits to move on to 10th grade and had failed no more than one semester of a core course.[1]

One key figure in that report highlighted to school and district officials the importance of paying attention to ninth-grade pass rates. As shown in Figure 1, whether students were on track in ninth grade was much more predictive of eventual graduation than were students' test scores. Students coming into high school with the top test scores (in the top quartile) were more likely than others to be on track, but a fifth of them (22%) finished ninth grade off track, and only 37% of those off-track students with high test scores graduated 4 years later. Even though they entered high school with very high test scores, many of these students failed at least one core course and they were unlikely to graduate, despite having strong academic skills. In fact, these students with very high test scores who were off track were half as likely to graduate as students with very low test scores who managed to pass their classes in ninth grade. Among students in the second quartile of achievement—with below-average skills—76% graduated if they managed to pass their classes in ninth grade. Among students with very low test scores, 68% graduated if they ended their ninth-grade year on track. So academic skills—which everyone thinks are a good predictor of graduation, and which are probably the most commonly used instrument for placing students into intervention programs—were not nearly as strong of a predictor of eventual graduation as freshman year failure.

Subsequent research showed that the on-track indicator was not only more predictive of graduation than test scores, but it eclipsed all other information about students, including information that school practitioners and researchers generally consider to be strongly associated

[1]The indicator had been developed by Miller, Luppescu, and Correa (2003) as a means of providing feedback to middle schools about how their graduates performed when they entered high school (an example is available at http://ccsr.uchicago.edu/publications/how-well-do-vivaldi-students-succeed-after-elementary-school).

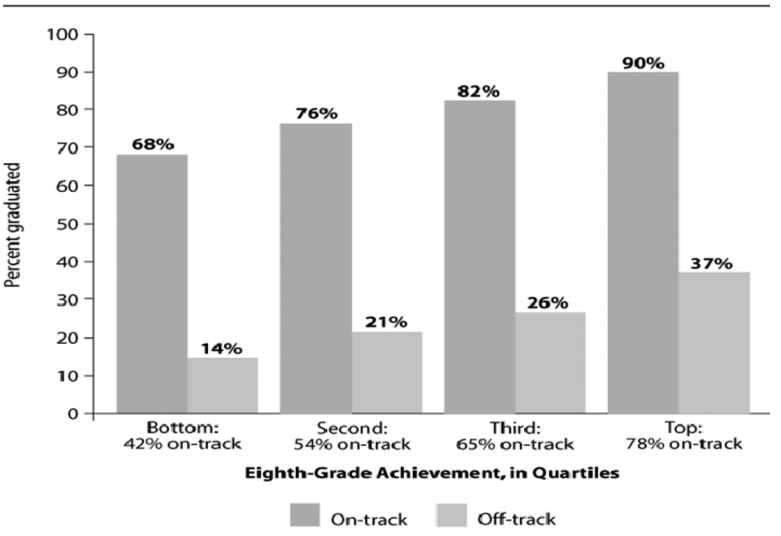

FIGURE 1 Four-year graduation rates by on-track status after freshman year and incoming reading and mathematics achievement in students entering high school in September 2000. From Allensworth and Easton (2005).

with graduation. As shown in Table 1, it is difficult to accurately predict who will graduate based on background characteristics and test scores when entering high school. Using a model that predicts graduation with students' eighth-grade reading and math test scores, gender, race, age when they entered high school, socio-economic status, and mobility during the middle grades, we

TABLE 1
Prediction of Graduation and Dropout Rates with Complete and Reduced Models

Indicator of Future Graduation/Dropout	*Prediction of Graduates in 4 Years (%)*	*Prediction of Nongraduates (%)*
Background characteristics: Eighth grade test scores, mobility, overage, race, economic status, gender	65	48
On-track in ninth grade (alone)	80	72
All of the above: On-track, test scores, background characteristics	81	72
GPA (alone)	80	73
Course Failures (alone)	80	66
Absences (alone)	77	59

Notes. Predictions were calculated through logistic regression models. Variables included in the model under "background characteristics" were: gender, race (African American, Latino, White, Asian, American Indian), mobility measured as the number of times student switched schools in the 3 years prior to high school, eighth grade math score on the Iowa Tests of Basic Skills (ITBS), eighth-grade reading score on the ITBS, months old-for-grade when began school, began school young for grade, began school old for grade. In addition, there were several indicators of economic status derived by matching students' residential address to information from the US Census on the block group in which they live, including the percentage of men unemployed, the percentage of families under the poverty line, median family income, and average years of education.

only correctly predict 65% of graduates in Chicago.[2] In contrast, the one indicator of on-track status, by itself, correctly predicts 80% of graduates. If one combines all of the background information with the on-track indicator into one model, it improves the prediction by just one percentage point—from 80% to 81%. In other words, once one knows whether a student is on track in ninth grade, all of the other background information about that student does not give substantially more information about whether that student will graduate. This does not mean that background factors do not matter; these background factors do show a relationship with graduation. Instead, it suggests that these background factors affect graduation rates by affecting students' performance in their classes. Graduation requires accumulating enough course credits, and most students drop out after failing to obtain sufficient credits after spending several years in high school.

Knowing that the other factors that affect dropout work through students' course performance provides a different way of thinking about the dropout problem. Teachers and administrators cannot possibly monitor and design programs for every issue that might be affecting students' performance in school. But they do not have to. Instead, they need to closely monitor how students are performing in their classes—and this is something they can and should do as part of their job. By keeping track of students who are at risk of failure and reaching out to the students who are struggling, they can target the students who actually need help in a way that is focused on what matters for graduation, rather than trying to fix problems that are out of their realm. It centers the problem of dropout within the work of the school, rather than focusing attention on factors that teachers feel they can do little about.

Showing the relationship between ninth-grade on-track rates and eventual graduation helps change people's perception of the nature of the problem, but this knowledge alone does not help schools know what to do to improve on-track rates. Although the on-track indicator provides an easy way to forecast graduation and track the progress of cohorts, it cannot be used for intervention because it cannot be computed until the end of the year. It is also too rough to be able to develop nuanced intervention plans with students—they are either categorized as on track or off track, with a wide range of course performance within those categories. It is a summative indicator of where ninth graders end up at the end of the year, not an indicator that works well for intervention.

A second report examined why students failed classes and went off track (Allensworth & Easton, 2007). That study showed that students' behaviors—especially their course attendance—explained why students failed classes. Test scores were only modestly associated with course failure. Statistical models that tried to explain failure rates using students' eighth-grade test scores, demographic characteristics, and economic characteristics explained only 12% of the variance in failure. When student behaviors (attendance and study habits) were added to the

[2]From Allensworth and Easton (2007). Predictions were calculated through logistic regression models from which overall correct prediction and specificity (predicting nongraduates) are included. Variables included in the model were: gender, race (African American, Latino, White, Asian, American Indian), mobility measured as the number of times student switched schools in the 3 years prior to high school, eighth-grade math score on the Iowa Tests of Basic Skills (ITBS), eighth-grade reading score on the ITBS, months old-for-grade when began school, began school young for grade, began school old for grade. In addition, several indicators of socioeconomic status were derived by matching students' residential addresses to information from the US Census on the block group in which they live, including the percentage of men unemployed, the percentage of families under the poverty line, median family income, and average years of education.

model, 73% of the variance in failure rates was explained.[3] Students failed classes because they stopped attending and putting in effort, and this was true among students with both high test scores and low test scores, and students from both high-poverty neighborhoods and low-poverty neighborhoods. That suggested that schools might improve on-track rates, and later graduation rates, by paying close attention to student attendance and effort throughout ninth grade.

The 2007 report also showed that students' GPA was just as predictive as the on-track indicator and allowed for a more accurate assessment of students' risk of eventual dropout. As shown in Table 1, GPA, failure rates, and absences in ninth grade are all very predictive of graduation 4 years later. Unlike the on-track indicator, students' grades are available after the first quarter of school. Attendance is available from the first week. Schools did not have to wait until the end of the year to know if their students were likely to be on track at the end of the year.

The report further suggested that schools could have the most leverage in moving graduation rates if they targeted intervention efforts at students who showed only modest signs of failure—those with one or two semester Fs, or no Fs and D averages. These were a group that was often not seen as being in need of intervention, compared to other students, because students who were failing half or more of their classes were much more obviously in need of support. By focusing on the students with extremely high rates of failure, schools were missing the majority of eventual dropouts. Furthermore, they were putting their intervention efforts into students with less than 5% chance of graduating—a group that would need considerable support to graduate, and for whom modest efforts such as mentors or support classes would likely not be sufficient.

STUDENT ATTENDANCE AND GRADES DECLINE DRAMATICALLY IN NINTH GRADE

Although ninth-grade course performance is highly predictive of eventual graduation, a number of studies in Chicago and elsewhere have documented large declines in student engagement and grades during the high school transition (Benner, 2011; Benner & Graham, 2009; Roderick & Camburn, 1999; Seidman et al., 1996; Simmons & Blyth, 1987). One study, which followed 32 Chicago public schools (CPS) students into high school, found that GPAs dropped by 1.48 points for boys and .76 points for girls from the end of eighth grade to the end of freshman year (Roderick, 2005). Subsequent research at CCSR has examined why students' course performance declines when they move into ninth grade. Beginning in the 2008–2009 school year, we followed a cohort of eighth graders as they moved from eighth grade through ninth grade and into their second year of high school.[4] Throughout their eighth- and ninth-grade years, we interviewed a group of 52 students seven times each, interviewed their English and math teachers each year, and observed their

[3]From Allensworth and Easton (2007). Variance explained comes from the R-square statistic from regression models predicting percentage of semester courses failed. Background variables are the same as described in note 2. Attendance is measured in days, with course cutting counted as partial days (e.g., one course missed out of seven counts as 1/7 of a day of absence). Study habits are measured through student surveys that ask: (a) *I set aside time to do my homework and study*; (b) *I try to do well on my schoolwork even when it isn't interesting to me*; (c) *If I need to study, I don't go out with my friends*; and (d) *I always study for tests*.

[4]This research is in process. The research team included David Stevens, Elaine Allensworth, Amber Stitziel Pareja, David Johnson, Marisa de la Torre, Todd Rosenkranz, Melissa Roderick, and Desmond Patton.

English and math classes twice in both eighth and ninth grade. We then used data on all students in their cohort across the entire district from administrative records and districtwide surveys to confirm the patterns that came out of the interviews and observations. We wanted to know why student performance declined so dramatically when students entered high school.

Contrary to expectations, we found that ninth-grade failures did not result from work getting harder in ninth grade. In fact, students felt that ninth grade was easier than eighth grade, and our classroom observations confirmed that the work was not more challenging. Students were asked to do almost the exact same types of tasks in their ninth-grade English and math classes that we saw them perform when we observed their eighth-grade classes. Districtwide surveys of students also found that students reported less academic pressure in their ninth grade classes than they had reported 2 years earlier when they were in seventh grade. At the same time, students put in less effort in ninth grade than they did in eighth grade. Unexcused absences quadrupled, from 4 days per year in eighth grade, on average, to 16 days in ninth grade. Counting excused and unexcused absences, students missed an average of 21 days of school in ninth grade, which is equivalent to over 4 weeks. Students' reports about their study habits declined by 0.21 standard deviations, compared to their responses when we asked the same students about their study habits two years prior.[5]

Why were they putting less effort into their courses? It seems that the decline in grades was largely a result of a dramatic decline in monitoring and support that occurred in high school, compared to middle school. In eighth grade, students could not get away with skipping class, not paying attention and getting behind in homework; in ninth grade, putting in effort became a choice left up to the student. Students failed because they stopped coming to class and doing work, and as they fell further behind it became harder to make up the work, which caused them to withdraw further. Students characterized ninth grade as being "more free" than eighth grade. Districtwide surveys of students show a decline in monitoring and support to be a trend across schools in Chicago. Students' reports about the degree to which their teachers monitor their performance and provide them support declines by 0.65 standard deviations, on average, from seventh to ninth grade.[6]

This highlights the critical need to closely monitor students' course performance and provide support before students fall too far behind to catch up. In fact, some of the high schools in the

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[5]The study measure consists of four items: (a) *I set aside time to do my homework and study*; (b) *I try to do well on my schoolwork even when it isn't interesting to me*; (c) *If I need to study, I don't go out with my friends*; and (d) *I always study for tests*. CCSR surveys are given to all CPS students in grades 6–10 and have been administered every other year since 1997. As a result, one can compare students' responses to the surveys over time. The decline of .21 standard deviations is derived from a nested model where level one is a measurement model, level two is observations, and level three is students. Variables are entered at the observation level representing students' grade (six through 12), with coefficients representing the difference from ninth grade. The model also has controls for year of survey administration at the observation level and student characteristics at the student level. Student characteristics include gender, race, old for grade, special education status, limited English proficient status, free or reduced-priced lunch, and students' eighth-grade reading score. The survey analysis was based on all respondents to the districtwide surveys, which is over 100,000 students in each survey year in grades 6–12.

[6]See note 4 for a description of the models that were used to calculate change from the middle grades to ninth grade. Questions that went into the measure of monitoring and support include: *My teacher: Notices if I have trouble learning something*; *Teacher really listens to what I have to say*; *Helps me catch up if I am behind*; *Will help me improve my work if I do poorly on an assignment*; *Gives me specific suggestions about how I can improve my work in this class*; *Explains things in a different way if I do not understand something in class*; *Is willing to give extra help on schoolwork if I need it.*

study had systems set up to monitor students based around the early warning indicators. In these schools, grades and attendance were higher than in other schools serving similar students.[7]

HOW STRATEGIC USE OF NINTH-GRADE INDICATORS CAN BE USED TO IMPROVE GRADUATION RATES

Chicago Public Schools (CPS) have been ahead of much of the country in the use of ninth-grade indicators of dropout. Catalyzed by the development of the freshman on-track indicator and the research supporting it, Chicago school administrators, central office personnel, and external partners developed a number of mechanisms to use ninth-grade indicators to stimulate school improvement. The indicators were first used by CCSR to provide feedback to middle schools on how their eighth-grade graduates performed when they moved on to high school. In 2003, the district picked up the indicator for its high school accountability system, basing their decision on a CCSR study that noted a strong correlation between the indicator and whether students eventually graduated (Miller & Allensworth, 2002). More recently, schools have used the early warning indicators examined in the 2007 CCSR report to develop strategies for improving student performance.

Schools in Chicago use the indicators to lead more students to make progress toward graduation in three general ways. First, research around the indicators is used to focus conversations and effort among staff, and with students and parents, on actionable problems. Second, schools use the indicators to identify students for intervention. Although teachers can monitor and intervene with students who are withdrawing without centralized data systems, schools need not rely on the efforts of individual teachers if they set up systems based on student-level data reports. Easy-to-interpret data reports that flag students who are showing signs of failure and withdrawal make it easy to see who needs help. Finally, staff can examine patterns in the indicators to address low student performance in a strategic way, based on the particular problems observed in their school.

FOCUSING CONVERSATIONS AND EFFORTS ON ACTIONABLE PROBLEMS

Before research on the ninth-grade indicators was available, conversations in schools about issues around dropout often focused on factors other than student course performance. School staff considered dropout and course failure to be problems that were outside of their control, a problem that stemmed from problems in students' lives outside of the school. Often, during meetings

[7]We compared average student grades across schools, controlling for students' entering characteristics. Hierarchical models predicting ninth-grade grades were run with students nested in classrooms, nested in schools. At the student level, controls were included for students' eighth-grade test scores in reading and math, and their English and math scores on the EXPLORE test taken in the fall of ninth grade, race, gender, socioeconomic status, age, and mobility. At the classroom level, control variables were included for whether the class was in the fall or the spring semester, average incoming test scores of students in the class, and type of class. In one school with better-than-expected attendance and grades (significantly positive school residuals), an on-track lab coordinator closely monitored students' grades and called them in for conferences. This school also made use of the data reports in ninth-grade teacher teams. At another school with better-than-expected performance, course attendance was tightly enforced by all staff in the school, with teachers calling home every day that a student missed their class.

about dropout issues, people voiced concerns about students coming back from incarceration, or pregnant and parenting teens. Although these students were certainly at high risk for dropout, they represented a very small percentage of dropouts. By showing that students were at risk based on their grades and attendance, the on-track research helped move attention away from students with obvious challenges to all students who were at risk. It also kept conversations focused on how students were performing, and what school staff and parents could do to support better performance, rather than trying to fix problems that are much harder for schools to address, such as crime and teenage pregnancy.

We have heard from school staff that data from the research reports help them have productive conversations with students and their families. When parents or students are called in to discuss student performance, data on the relationship between attendance or grades and eventual graduation can drive home the importance of attendance and homework completion. By keeping the focus on data, conversations can move away from finger pointing about who is to blame for problems at school (the student, the parent, the teacher) to making plans for improving the indicator.

Simple graphs, such as a graph that shows the relationship between absence in ninth grade and eventual graduation, can make explicit the critical nature of course attendance for making progress in high school (see Figure 2). Figure 2 shows that it is not just high absence rates that lead students to fail—even 1 week of absence per semester is associated with a decline in graduation rates of 20 percentage points. When talking to parents, counselors can show where their student falls on the graph and what happens to the likelihood of graduating if he or she misses more days of school—a powerful message in a district where it is typical for high school students to miss 4

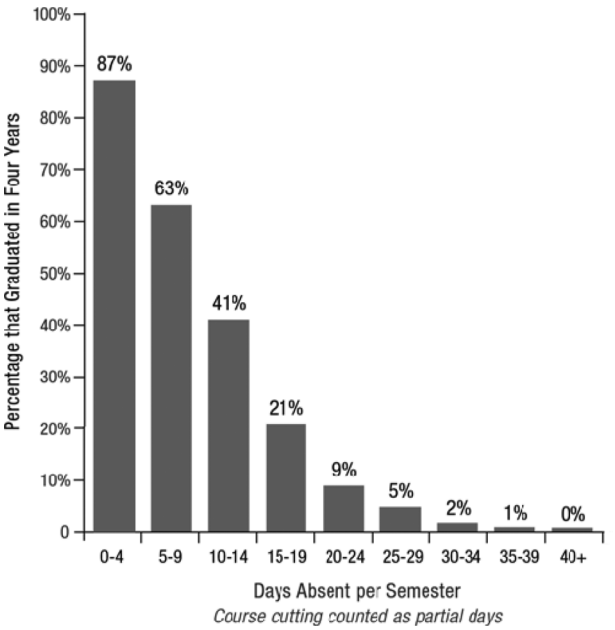

FIGURE 2 Four-Year Graduation Rates by Ninth-Grade Absences. From Allensworth and Easton (2007).

weeks of school a year. This makes it more likely that the parent will interpret the counselor's concern about the student's attendance to mean that she cares about the student and her later outcomes, instead of feeling like she is being blamed for bad behavior. Likewise, when school teams consider discipline strategies or enrichment programs that may take students out of class, a chart such as Figure 2 can help them weigh the benefits of that strategy or program versus the costs of students falling behind from missing class. One administrator in CPS, for example, considers that figure when a student comes to her office in need of discipline; she asks herself whether it is worth lowering that student's probability of graduating by giving a week's suspension.

To help parents, students, and teachers think about these issues, CCSR issued one-page flyers targeted to each group.[8] School staff members use these flyers to talk about the importance of attendance, effort, and on-track rates for graduation. One year, the district sent the parent flyers to the homes of all entering ninth graders. Some counselors keep the flyers in their office to give to parents when students start to show signs of disengagement to start a discussion about how to help students get back on track.

IDENTIFYING STUDENTS FOR INTERVENTION

When the 2007 report came out about what matters for staying on-track and graduating, the CPS Department of Graduation Pathways responded by developing an early warning reporting system with hot data designed to support data use in high schools. They developed three key data tools. One tool was designed for prevention—to identify students who would need support before they even started high school. Another was designed for early intervention—to identify students as they showed signs of failure or withdrawal during the ninth-grade year. The third was designed for recovery—to get students back on track after they failed.

The district also recognized that schools needed to develop strategies about how to use the data tools. Through the Bill and Melinda Gates Foundation, they were able to get funding to support the development of strategies around using these tools in six high schools through the city, designating the schools as *on track labs*. Each school gained two extra staff members whose job was to help the schools figure out ways to use the data tools to get more ninth graders on track. These on-track lab coordinators approached their jobs in different ways in different schools, and in the end the district wrote a guide for schools based on the coordinators' experiences (Ali et al., 2010). This guide provides information about how schools used the data reports, what worked, and what they found valuable with the data tools.

The *Freshmen Watchlist* was a report designed to alert high schools to which of their incoming ninth graders were at risk of failure, so that schools could reach out to them in the summer and through the first quarter of the school year. The watch list provided high schools with a list of students who were scheduled to enroll in the school as first-time ninth graders, color coded by risk for failure based on students' performance in eighth grade—their grades in reading and math, attendance, and test scores. The district also sponsored a summer transition program for high schools, called *Freshman Connection*, designed to ease the transition into their new school.

[8]These are available at http://ccsr.uchicago.edu/publications/what-matters-staying-track-and-graduating-chicago-public-schools.

School staff could use the watch lists to reach out to targeted students during the summer before the school year began, including efforts to get students to enroll in a summer course and start the school year with a credit already in hand. The on-track lab coordinators at some schools used this time to establish relationships with students; this made it easier for them to reach out during the school year to students whose attendance or grades were flagged for intervention.

After the first quarter of the year, schools received similar reports, but based on students' ninth-grade performance, called the *Freshmen Success Report*. This report again listed each student by name, but flagged students based on whether they had high absences, low course grades (Ds), or course failures. The reports also showed their grades in each one of their core courses. Updated weekly, these reports allowed schools to intervene immediately with students whose attendance was lagging. They allowed counselors to easily know which students were failing or close to failing their classes throughout the year, and this allowed them develop targeted intervention strategies based on how many courses a student was failing, his or her attendance, and his or her test scores. The reports allowed teams of teachers to get together and talk about specific students, examining in which classes students were struggling across the teacher teams. They could then develop coherent messages and plans for working with the same student across multiple classes, and could share information about how to reach students who might be succeeding in some classes and failing in others.

After each semester ended, the district put out a *credit recovery* report that showed the school how many and which students were in need of making up failed credits, across all grades. Although schools could have produced such information from digging through their files to see who had failed each semester and who had not yet made up the credits, the reports made it easy to know who needed to make up credits, and which credits needed to be recovered, across all students in the school. This information is needed for school administrators to know which types of classes should be offered and scheduled. A comprehensive list of who needs to make up which credit also helps schools reach out to all students who need a particular credit to make sure that every student is working to recover needed credits.

This system of data tools allowed schools to develop systematic practices around identifying students for intervention. Having a system that identified students in need of intervention, and showing why they were at risk, made it much harder for students to fall through the cracks. In schools where teacher teams got together around the success reports, teachers had to confront questions about why students were failing their classes and make plans to reach out to those students. In schools that designated a counselor or an on-track coordinator to monitor success and recovery reports, students with poor attendance and grades no longer went unnoticed. The reports moved the problem of course failure from something that was happening in individual classrooms to something that was a shared responsibility among teachers and school staff.

In the *Focus on Freshman* study, students at on-track lab schools talked to interviewers about the messages they were getting from their counselors and teachers about needing to "get back on track." Students talked about receiving a first quarter F and being called into conferences with their on-track coordinator, teacher, and parent to develop plans for passing the class. They talked about how their on-track coordinator would be on them if they were absent. These tools forced school staff to start talking to students about their performance, and the research backing helped them talk to students about their performance in a way that was viewed as supportive, rather than critical—students needed to come to class and bring up their grades so that they would graduate.

Staff members were showing concern about their futures by working to keep them on track, not just complaining that students were putting in too little effort.

USING INDICATOR PATTERNS TO ADDRESS LOW STUDENT PERFORMANCE IN A STRATEGIC WAY

Data tools, based on individual students, are useful for developing intervention strategies and reaching all students who need help. Ultimately, though, schools need to identify structural issues that are leading to low performance among large groups of students if they are to make substantial progress in getting more students on track to graduate. A third type of data report that can be used to improve on-track rates summarizes student performance in a school over time and breaks down the indicators by subgroups within the school and patterns of course failure across time and classes.

Researchers at CCSR, particularly Melissa Roderick, collaborated with a network of high school leadership teams, called the Network for College Success, to develop reports that schools could use to diagnose their on-track rates (Montgomery, Roderick, & Bolz, 2009).[9] These reports showed how each CPS high school was doing on the indicators related to freshman year performance—student on-track rate, course failures, grades, and attendance, broken down by students' gender, incoming test scores, and disability status. They also showed how schools were doing with their subgroups relative to other schools in the system. The reports allowed schools to compare the performance of their students with top test scores to students with similar test scores at other schools, or their students with weak scores to students with similar achievement levels elsewhere. In discussions among schools in the Network for College Success, such comparisons led to questions about variation in students' experiences and the ways in which schools supported students with different academic needs. Conversations across school leadership teams were particularly instrumental in helping schools make use of the data reports, because they could ask questions about why their school had different patterns than the others, and learn about the strategies being used in different places.

Figure 3 demonstrates how these types of reports can lead to thoughtful conversations among teams of school leaders. This chart shows data from a real school, their on-track rates broken down by students' gender and their incoming test scores. This school does not serve many students with very high test scores, as indicated by the lack of bars among students with a score of 17 or higher on the ACT Explore[10] exam. Among students with scores of 14–16, however, on-track rates are better than the system average; the bars for students in this group are higher than the diamonds that represent the system average. This school seems to do a good job with students who are relatively high-achieving, compared to their peers. However, among students with the lowest test scores, on-track rates are substantially lower than the system average. In the absence of a comparison to the system average, the principal from this school might look at these data and

[9]These reports are available at http://ccsr.uchicago.edu/school, under Getting On-Track: How Your School is Doing with the Freshman Year. CCSR director Melissa Roderick worked with schools in the Network, and with researchers at CCSR, in an iterative process of report development and refinement.

[10]As the first in a three-part series of exams culminating in the ACT, the ACT Explore exam is designed to be administered to eighth and ninth graders (followed by the PLAN in tenth grade) to assess their academic skills in English, reading, math, and science.

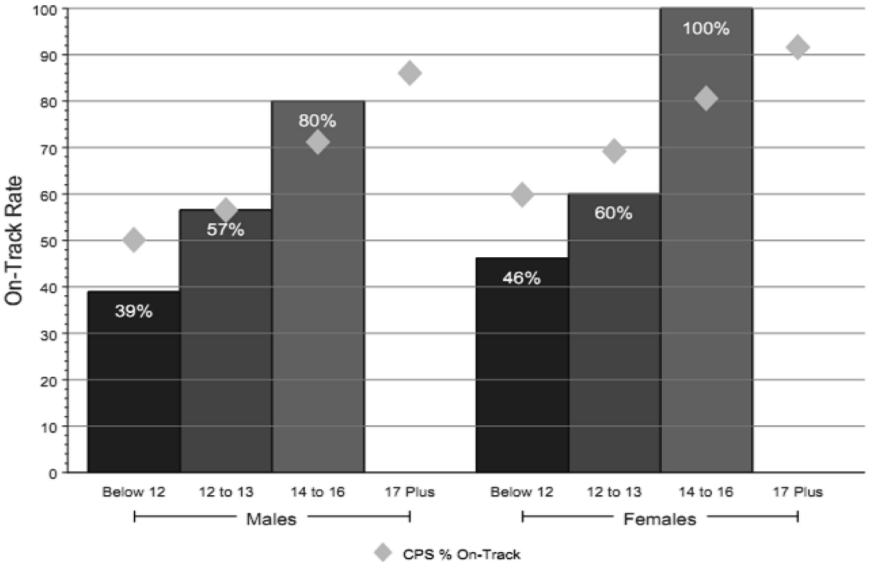

FIGURE 3 On-track rates in 2009–2010 by gender and ninth-grade EXPLORE scores at example school. From Montgomery, Roderick, and Bolz (2009).

see nothing of interest. After all, it is not surprising that the students with high test scores are more likely to be on track than the students with low test scores. However, seeing that students at that school with low test scores perform worse than students with similar test scores at other schools suggests that the school is not serving low-achieving students as well as other schools; the problem is not just that they come in with low achievement. At the same time, the school is having high success with its high-achieving students, and other schools might benefit from knowing what it is that they do differently with students coming in with high scores.

The reports also show how performance for subgroups has changed over time, allowing schools to evaluate whether the changes they have made to address on-track rates have had success with the intended students, and if other groups are in need of special efforts. Charts showing on-track rates over time revealed that the school that showed better on-track rates for its relatively high-achieving students has made substantial progress with those students over time. Its on-track rates for high-achieving students moved from around 70% for a number of years to around 90% for the last 3 school years. At the same time, they made no progress in on-track rates among students with the lowest test scores. These reports suggest a different approach is needed for students entering this school with very low achievement.

Another type of analysis that was recommended in the 2007 report (Allensworth & Easton, 2007) was to examine failure rates and student attendance across periods in the day, subjects, and across the school year. It is very common, for example, for attendance and pass rates to be much lower in first period classes than in others. In some schools, ninth period is problematic. In some schools, attendance declines dramatically over the school year; in others, it is relatively steady. Some schools have high failure rates in English but not math; in others it is reversed. Analysis of these patterns can point to structural issues for school staff to address.

HAS ATTENTION TO INDICATORS MADE A DIFFERENCE FOR STUDENT ACHIEVEMENT?

At a minimum, we hope to see that on-track rates have been improving since all of these data reports have been made available to Chicago's schools. Figure 4 shows on-track rates in Chicago from 2001 through 2011. Beginning in 2003, the ninth-grade on-track metric became part of the district accountability system for high schools. That year saw a 1-year increase in on-track rates, up to 62%. With the exception of that one year, on-track rates hovered between 57% and 59% from 2001 to 2007. The first research report, which showed the importance of ninth-grade on-track rates, came out in 2005. There was no discernible change in on-track rates with the release of that report, with on-track rates holding fairly steady at around 59% for the next several years. Although that report showed the importance of on-track rates, it did not give much information that would help schools work on the problem. The second research report which broke down the factors underlying on-track rates came out in spring 2007. There was a slight upturn in on-track rates the following year, in spring 2008, but it was not noticeably different from some of the prior years. In the 2008–2009 school year, the district started issuing its individual student data reports that schools could use to monitor students and develop intervention plans that targeted specific students. In that year, there was a large increase in on-track rates, up to 64%, much higher than any of the previous 8 years. In the following year, on-track rates rose again to 69%, and in the following year, to 73%.

Without a systematic investigation, examining changes in student outcomes, together with changes in practice around data, we cannot know for sure that the improvements resulted from data use. All we can say is that a dramatic change in student performance occurred at the same time when schools started getting individualized data about their students. These changes were

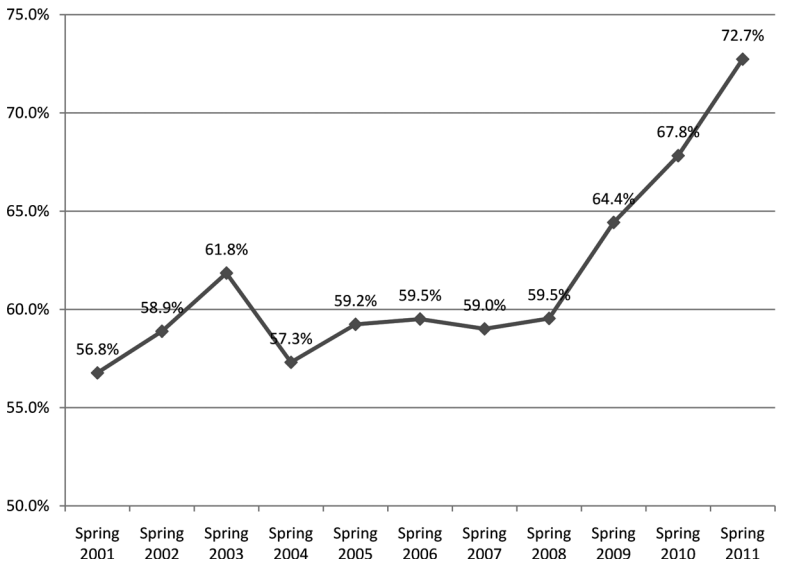

FIGURE 4 On-track rates in Chicago 2001–2011.

larger than the change that accompanied the entrance of the metric into the district accountability system, and were sustained. Furthermore, they were not a result of students entering high school with stronger academic performance. Students' entering test scores on the exam given at the end of the eighth grade (the Illinois Standards Achievement Test, or ISAT[11]) and the exam given at the beginning of ninth grade (the ACT Explore) have been flat (Luppescu et al., 2011). The trends are promising, but future research should rigorously examine the degree to which data use practices at high schools are associated with improvements in student performance.

NINTH-GRADE INDICATORS HOLD PROMISE FOR IMPROVING GRADUATION RATES

Low rates of high school graduation have been a difficult problem for many years. Chicago's efforts around using early warning indicators hold promise for leading many more students to make progress towards obtaining a diploma. The data tools, together with clear research evidence on why the indicators matter, provide a way to work on the issue of dropout that makes sense to school practitioners and that can be incorporated into their daily work.

One benefit of the indicators is that they help practitioners focus on the factors that directly affect graduation—whether students are coming to class and earning credits—rather than blaming the myriad factors that may be affecting attendance and effort in those classes. Students may be missing class and putting in low effort for many reasons, and these external factors should not be dismissed. Schools cannot hope to address all of them, however, and most educators will see them as outside the scope of their work. But it is within the scope of their job to try to help students succeed in their classes. It moves the focus from blaming students and their families to a problem that teachers and school staff can, and should, address. It provides a concrete way to reach out to students and families, as everyone works toward the shared goal of helping students make progress toward graduation. It allows more productive relationships between teachers and students and teachers and parents.

Data reports on the indicators help schools to be more systematic about their practices around graduation and dropout. The monitoring reports make it much more likely that students will not fall through the cracks when they start to disengage. They make it easier for schools to intervene before students fall so far behind in their classes that they cannot catch up. The school-level reports make it more likely that school will notice subgroups of students that are not being served well. As they compare their students' performances to those of similar students in other schools or in early cohorts, the reports can lead school teams to ask what other schools are doing differently, or how their practices have changed over the years. The data can lead to difficult but important conversations among school staff about where the school could be doing a better job in supporting its students to make progress towards graduation.

Continuing research is now examining the school and classroom conditions that seem to promote on-track rates. There is a great need to study how schools use the data reports and to determine which specific practices are associated with better outcomes. There is also a need to validate the improvements in on-track rates as mattering for later outcomes—discerning whether

[11]ISAT is the state test that measures reading and mathematics achievement in grades 3 through 8 and science achievement in grades 4 and 7.

efforts to improve ninth-grade outcomes have long-term effects, or if they fade out after the first year of high school. A number of different elements came together to support the use of early warning indicators in schools in Chicago. There was pressure to improve on-track rates through district accountability structures that considered on track as one of many high school indicators. There was research that showed clear and strong associations between the indicators and eventual graduation. There were data tools that provided real-time information on which students needed support. There were data reports that school leaders could use to diagnose larger problems in the school and evaluate the success of past efforts. On-track rates improved when all of these elements were in place. Future work is needed to see which practices are most beneficial to schools as they work towards helping more students get on track and graduate.

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