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High School Graduation Rates through Two Decades of District Change

The Influence of Policies, Data Records, and
Demographic Shifts



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Executive Summary

High school graduation rates in the Chicago Public Schools (CPS) have shown remarkable improvements over the past 16 years. Students used to be about as likely to drop out as they were to graduate; now they are three times as likely to graduate as to drop out. Moreover, recent large improvements in the percentage of students on-track to graduate at the end of their ninth-grade year suggest that graduation rates will continue to improve for several years to come.¹ High school graduation is a strong indicator of a host of important life outcomes, including post-secondary and employment outcomes, health, incarceration, and life expectancy.² Thus, these trends potentially suggest a much brighter outlook for thousands of students enrolled in Chicago's schools today, compared to students in prior years.

Changes of this magnitude prompt questions about why graduation rates have improved. There are concerns that graduation rates have been increasing because of lowered expectations for students' academic performance, or because of changes in data collection, data coding errors, or differences in how the rate is calculated. There also have been changes in the characteristics of students attending CPS high schools and improvements in elementary school achievement; these factors could affect graduation rates regardless of any changes in how high schools operate. Yet, the district has also experienced changes in its high schools—many new high schools have opened, and there have been a number of changes in high school practices and policies aimed at promoting student achievement and educational attainment. To what extent are the improvements in the high school graduation rates attributable to these various factors? This report addresses this question, assessing the degree to which different factors could potentially be responsible for the changes over time in graduation rates.

Key Findings

Graduation rates have increased by 22 percentage points over the last 16 years, from 52.4 percent among students who turned 19 in 1998, to 74.8 percent in 2014.³ The most rapid rise in graduation rates has occurred over the last six years. Freshman on-track rates have also risen considerably, from 48 percent among students who were 19 years old in 1998 to 82 percent for

¹ Students are on-track to graduate at the end of the ninth grade if they have sufficient credits to be counted as a sophomore and are failing no more than one semester of a core course.

² Belfield & Levin (2007); Cutler & Lleras-Muney (2006); Sum & McLaughlin (2009); U.S. Department of Labor (2013a, 2013b); Day & Newburger (2002); Heckman & LaFontaine (2007); Muennig (2005, October 24-25).

³ This report calculates graduation rates based on students' age, rather than the year they started high school, due to cohort fluctuations that result from changes in the elementary school grade promotion standards.

students who will turn 19 in 2017.⁴ The improvements in freshman on-track rates in recent years suggest the high school graduation rates will continue to improve.

Graduation rates have improved for students of all racial, ethnic, and economic backgrounds, but racial and ethnic gaps in graduation rates increased. Graduation rates are higher than they were in the past for students of many different backgrounds, including race and ethnicity, neighborhood poverty, gender, and disability status. In addition, gaps in graduation rates by gender, neighborhood poverty, and learning disability status have all declined. However, racial and ethnic gaps increased over time, with graduation rates for African American students falling further behind the rates for white and Latino students, until the most recent years. While there have been some considerable changes in the backgrounds of students enrolling in CPS high schools—including fewer students living in high-poverty neighborhoods, more students from affluent neighborhoods, and more Latino students—these changes only explain a very small proportion of the improvements in graduation rates.

The largest improvements in graduation rates have occurred at non-selective enrollment, non-charter high schools. Some of the improvements in graduation rates could be due to changes in the types of high schools students attend; a growing proportion of students have enrolled in charter schools and selective enrollment high schools over time. Most of the changes that could be accounted for by new schools could also be accounted for by changes in the backgrounds and entering skills of students who enroll in these schools; it is hard to disentangle whether it was the school practices that made a difference or the types of students the new schools attracted. Charter schools had higher graduation rates than other non-selective enrollment schools for many years. However, graduation rates at non-charter schools are now close to those at charter schools. Most of the increase in district graduation rates has come from improvements at non-charter, non-selective enrollment high schools, which include neighborhood schools, career and military academies, and schools with selective programs.

Not only are more students graduating, but graduates have higher achievement levels and more rigorous coursework than in past years. From 2003 to 2014, CPS graduates' ACT scores rose from an average score of 16.7 to an average score of 18.6 while the number of students who made it to the end of eleventh grade and took the ACT increased considerably. The proportion of students scoring 3 or better on an AP exam has steadily increased, even as the number of students taking AP courses has increased fourfold since 2000. Students are also attending school at higher rates; over the past six years, high school attendance rates have risen from 78 to 89 percent. Thus, not only are more students graduating but graduates also have stronger academic qualifications than in the past, suggesting that the increase in graduation rates is not due to lowered expectations for student performance.

Data coding issues could have contributed to some of the increase in graduation rates, but the potential influence of data issues is small. There has been concern that the district-generated graduation rates, and trends in graduation rates, have been affected by improperly coding dropouts as transfer students, or counting alternative school and GED recipients as

⁴ Students who turned 14 years old in 2013 or later may not yet have entered high school in time to be included in this study. Therefore, this study only includes students who turned 14 years old by September 2012.

graduates. There is evidence to warrant both of these concerns. At the same time, even the most conservatively estimated rates, where all transfer students and students at alternative schools are counted as non-graduates, show large improvements in the percentage of students earning a diploma, especially in the last six years. Data coding issues could account for some of the improvements in graduation rates between 2005 and 2008, but not in subsequent years. This does not mean that data records are completely accurate in recent years—just that they could not account for the improvements in graduation rates in the most recent years.

Changes in students’ demographic background characteristics and incoming achievement account for all of the graduation rate improvements prior to 2006. Entering test scores improved for a number of years, particularly in math, and this change in entering achievement explains most of the improvements in graduation rates up to the 2006 cohort. Incoming achievement levels of subsequent cohorts (those turning 19 in 2007 or later) stopped improving, and even declined considerably. Thus, students’ incoming achievement levels do not explain the improvements in graduation rates since 2006.

While incoming test scores were flat or declining for the most recent cohorts of students to turn 19, subsequent cohorts of students entering CPS high schools have shown increasingly higher levels of prior achievement. These cohorts of students have not yet turned 19, but for each of the past four years, entering ninth-graders have had higher incoming achievement (eighth-grade test scores and course grades) than students in the preceding year. These changes in students’ incoming achievement could account for about half of the increase in on-track rates in the last four years.

Improvements in students’ performance while in high school—compared to students who started high school with similar achievement in the past—account for most of the improvements in graduation rates. Students now take more classes and earn more credits during their ninth-grade year than in the past, and high school course pass rates have improved. Increases in the number of credits earned in ninth grade, the proportion of students who are on-track in ninth grade, and the proportion of classes passed in ninth grade explain all of the improvements in graduation rates beyond those accounted for by changes in students’ backgrounds and incoming skills. In recent years, high school attendance during ninth grade has improved considerably, which explains most of the increase in on-track rates beyond that which is accounted for by changes in students’ incoming skills. Furthermore, students who get off-track for graduation in ninth grade are more likely to eventually get back on-track and graduate than in prior years. Improvements in course pass rates and attendance have been accompanied with improvements in gains on standardized tests. Thus, students are performing better in their high school classes than students entering CPS high schools with similar skills and backgrounds in the past. The improvements in ninth-grade course performance seem to account for the improvements in graduation rates in recent years. High schools in Chicago seem to be doing a better job supporting students through to graduation, and this accounts for most of the improvements in graduation rates.

Overall, the high school environment has changed considerably in the last 20 years. There are many more high schools in the district, and many of the new high schools have strong graduation rates. At the same time, high schools that have been in existence since the beginning period of this study are showing much higher graduation rates than in the past, and this is not simply a result of serving better-prepared incoming students. Schools are increasingly using early warning indicators to monitor students' performance and prevent students from failing classes, partnering with nonprofit groups to provide mentoring and support to at-risk students, and providing opportunities for students to recover the credits from classes that they have failed.

Sometimes improvements in graduation rates are dismissed as being a low-level goal, and people question the value of increasing the number of students with a diploma when many graduates do not have sufficiently high achievement to succeed in college. However, high school graduation is the strongest predictor of almost any outcome that we care about as a society. Thousands of additional students earn diplomas every year, suggesting considerably better life outcomes for Chicago's youth.

Past Consortium Research on Select CPS Policies Influencing Graduation Rates Over the Past 16 Years

CPS has enacted many different policies over the past two decades, with mixed consequences for graduation rates. Improvements are a result of the total influence of many different policies—with different factors influencing graduation rates in different years:

- **Improvements in math achievement in the elementary schools** in the 1990s were associated with higher graduation rates in the high schools through the early 2000s.^A
- **Grade promotion standards** that were initially enacted in 1995-96 for grades 3, 6, and 8 had a number of consequences for high schools in later years. By delaying the entry of low-achieving students into high school, the achievement levels of incoming ninth-graders increased. However, the policy also led more students to begin high school old-for-grade. Higher entering achievement levels were associated with higher graduation rates, but students who entered high school at older ages were less likely to graduate.^B Thus, there were contradictory effects of the policy.
- **New graduation requirements and high school curriculum standards** were enacted in 1997. Students started taking more classes in high school, which helped them earn credits towards graduation.^C But around the same time that students started taking more classes, they also were required to take more challenging (college-preparatory) classes, and graduation rates did not improve as much as they should have.^D Thus, this policy also had contradictory influences in graduation rates.
- **Decisions to open new selective enrollment schools and charter schools** were associated with slightly higher graduation rates in some years. This may be due in part to these schools attracting new students to the public schools, as well as higher graduation rates at these schools than at others. Enrollment at charter high schools has increased dramatically in recent years, but the gap in graduation rates between charter and neighborhood schools has diminished, so that changes in school enrollment account for little of the overall improvements in graduation rates.
- **The district started providing real-time early warning data reports and credit recovery reports to high schools** in 2008, and the biggest changes in graduation and on-track rates occurred in the years after schools started

getting these data. Improvements in graduation rates in the most recent years are largely explained by improvements in course pass rates in the ninth grade. In fact, graduation rates and high school test scores improved even during a period of declining and stagnant incoming achievement levels among ninth-grade students.

^A For more information on changes in students' achievement levels over time, including their eighth-grade test scores, see Luppescu, Allensworth, Moore, de la Torre, Murphy, & Jagesic (2011).

^B For more information on the effects of these policies on students' movement through school and students' likelihood of graduating, see Allensworth (2005); Roderick, Nagaoka, & Allensworth (2005); Allensworth & Miller (2002).

^C For more information on the 1997 high school redesign initiative and subsequent changes in students' coursework, see Lee (2002).

^D For more information on changes in students' graduation rates associated with the change in graduation requirements, see Montgomery & Allensworth (2010).

Introduction

Over the past 16 years, high school graduation rates in the Chicago Public Schools (CPS) have shown remarkable improvement. According to the graduation rates posted by the district, students used to be as likely to drop out as they were to graduate. In 1994, about 47 percent of students who entered ninth grade in the district graduated within five years (by 1999). In 2014, the district posted a five-year graduation rate of 69 percent, suggesting that students are now more than twice as likely to graduate as to drop out.⁵ That is a considerable change in the educational attainment of students in Chicago's high schools. CPS granted about 6,000 more diplomas in the year 2014 than in 1999. A high school diploma has become crucial for success in the labor market, and attainment of a diploma is strongly associated with a host of benefits, including better health, a higher life expectancy, and a lower chance of incarceration.⁶ Thus, these changes in graduation rates suggest substantially better life outcomes for thousands of students.

CPS is not the only district that has been showing rising graduation rates. A number of districts across the country are also seeing increases. Nationally, the high school graduation rate rose to 82 percent in 2014, after hovering between 71 and 74 percent for over a decade in the 1990s.⁷ Chicago's increases in graduation rates have outpaced the increases in most other districts, but are part of a general national trend.

The district also projects graduation rates to continue to increase over the next four years, based on districtwide freshman on-track rates.⁸ Prior research has shown that freshman on-track status is highly predictive of graduation four years later, with on-track students nearly four times more likely to graduate than those who are off-track in ninth grade.⁹ Freshman on-track rates posted by

⁵ CPS Department of Accountability. Retrieved from <http://www.cps.edu/SchoolData/Pages/SchoolData.aspx>. In fall 2015, CPS revised its graduation and freshman on-track rates down in response to concerns about the accuracy of some of the data records. However, because the revisions were only done for the most recent years, we cannot use them to show long-term trends.

⁶ Belfield & Levin (2007); Cutler & Lleras-Muney (2006); Sum & McLaughlin (2009); U.S. Department of Labor (2013a, 2013b); Day & Newburger (2002); Heckman & LaFontaine (2007); Muennig (2005, October 24-25).

⁷ The national graduation rates for 2014 are available at: https://nces.ed.gov/ccd/tables/ACGR_RE_and_characteristics_2013-14.asp. More details on national rates can be found in Balfanz et al. (2014); National Center for Education Statistics (2013); Stetser & Stillwell (2014). The methodology used to calculate the national rate changed between 2010 and 2011. Previously, an averaged freshman graduation rate (AFGR) was used; now, an adjusted cohort graduation rate (ACGR) is used. Both rates are available for 2011 and 2012; the ACGR is 1 percentage point lower than the AFGR in those years. See websites below: https://nces.ed.gov/ccd/tables/ACGR_2010-11_to_2012-13.asp and https://nces.ed.gov/programs/digest/d12/tables/dt12_124.asp.

⁸ Students are on-track to graduate at the end of the ninth grade if they have sufficient credits to be counted as a sophomore and are failing no more than one semester of a core course.

⁹ Allensworth & Easton (2005).

the district have been rising steadily since 2008, from 59 percent among students who started high school in the 2008-09 school year to 84 percent among students who started high school in 2014-15.¹⁰ As a result, Chicago’s mayor has predicted that graduation rates could exceed 80 percent within the next several years.¹¹

Thus, there is good reason to be optimistic about improving educational attainment in Chicago’s schools. At the same time, such large increases in graduation rates raise questions about why they have gone up. There have been concerns raised about whether the improvements can really be believed, or whether they are a result of inaccurate data or lower academic expectations.¹² If the increases in graduation rates do not represent real improvements in achievement, then it is important to understand what is happening so that problems in consistency over time can be addressed. If they do represent real improvements in student achievement, then it is essential to acknowledge that progress and understand why improvements have been made. New educational policies are enacted regularly; policymakers need to know what is working so that successful practices continue in the face of new reforms.

Potential Reasons for the Increases in Graduation Rates

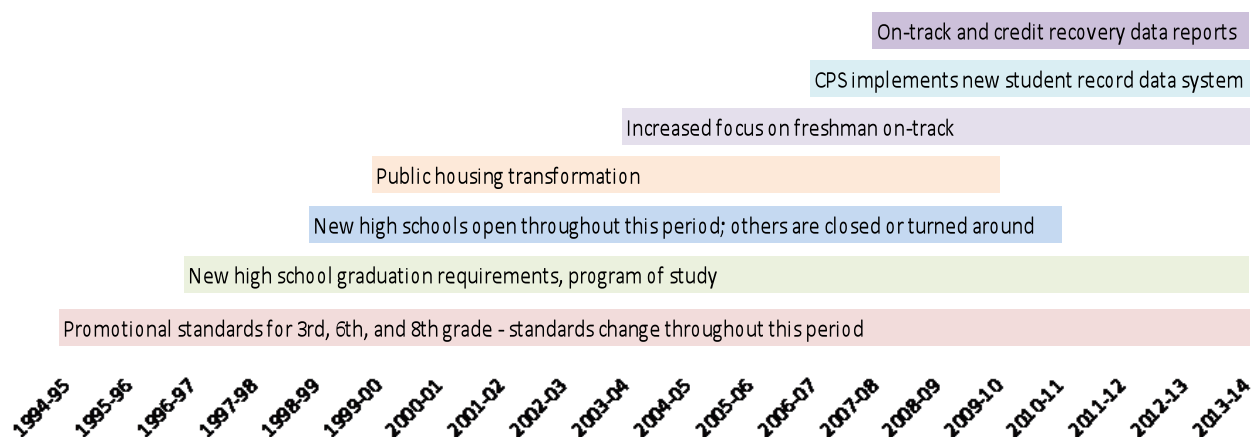
Large improvements in graduation rates naturally lead people to wonder why they have changed. One explanation is that high schools have improved their practices so that more students are graduating. Many new policies have been enacted in CPS high schools over the past two decades that were intended to improve student achievement, and these may be responsible for the changes in graduation rates. At the same time, there have been many other changes in Chicago’s schools over the past two decades, including shifting population demographics, housing policies that have affected the economic composition of students in CPS high schools, an updated student record data system (the IMPACT system), and changes to promotion and graduation requirements—all of which could affect the high school graduation rate (see Figure 1), and are discussed in more detail in subsequent sections of this report. Some of these changes might produce changes in the graduation rates without representing “real” changes in student achievement; students may receive a diploma with less effort, or data coding on students’ outcomes (e.g., reasons for leaving school) may have changed over time. Alternatively, student achievement might be improving, but not because of improvements in high schools; rather, improvements in elementary schools could lead students to enter high school better prepared for high school work.

¹⁰ CPS Department of Accountability. Retrieved from <http://www.cps.edu/SchoolData/Pages/SchoolData.aspx>

¹¹ Retrieved from http://www.cityofchicago.org/city/en/depts/mayor/press_room/press_releases/2014/apr/mayor-emanuel-announces-chicago-public-high-schools-on-track-to-.html

¹² Grossman (2015); Vevea (2015, March 31); Karp (2015, February 26).

Figure 1: Policy Changes in Chicago That Could Affect Graduation Rates



It is beyond the scope of this study to discern the degree to which specific policies influenced graduation rates. These policies were often overlapping with each other and went through different stages and forms across the years, making it very difficult to discern exactly how each policy influenced graduation rates in combination with the others. (Some of the policies have been studied in the past, and the general conclusions of those studies are described in the text on p. 9.) Instead, this study addresses questions about the degree to which the graduation rates represent real improvements in the degree to which Chicago’s high schools are educating students, and the implications for strategies moving forward. The report is organized around the following questions:

- **Have graduation rates improved for all students in Chicago, or just for students with specific backgrounds?** Chapter 1 shows trends in graduation and on-track rates for the district as a whole and for subgroups of students based on race, gender, neighborhood poverty, and identification as learning disabled. *If graduation rates have improved equitably, all of these groups should show improvements in their graduation rates and the gaps between groups should decline.*
- **Have graduation rates increased because of inaccurate record-keeping?** Graduation rates could seem to be improving if students who drop out are increasingly miscoded as transfer students, or students who transfer to alternative or GED programs are counted as graduates. *If this is the case, we should see increases in the percentage of students who transfer from the district or graduate from an alternative school that outweigh the increase in the percentage of students receiving a diploma.* Chapter 1 addresses this issue; details about data issues that could have affected graduation rates are described more thoroughly in Appendix B.
- **Are graduation rates going up because high schools have lowered the standards for obtaining a diploma?** With the rise in the percentage of students who receive diplomas comes a concern that schools may have lowered their expectations for students’ academic

performance, and be passing weaker students who previously would have failed and dropped out. Graduation rates have become part of the accountability system for high schools, and there may be pressure to give students credit for work that previously would have resulted in failure. *If this is occurring, we should see that graduates in recent years showed lower attendance, lower test scores, and less rigorous coursework than graduates in earlier years, particularly among those graduating with the lowest levels of achievement.* Chapter 2 shows the degree to which the qualifications of CPS graduates have changed over time with the increase of students who are obtaining a diploma.

- **Are graduation rates improving because high schools are serving different types of students, with higher achievement prior to high school?** Graduation rates might increase over time if Chicago's high schools started serving different types of students. There have been demographic and economic changes in Chicago over time, resulting in shifts in the racial/ethnic composition of the district, and the poverty levels of the neighborhoods where students live. The district also enacted policies that delayed or prevented students' entry into high school.¹³ There also were improvements in students' academic skills coming out of the middle grades during the mid-2000s, especially in math.¹⁴ Thus, the characteristics of students entering CPS high schools were not consistent over time. Chapter 3 shows changes in the characteristics of students entering CPS high schools over time, and the potential influence of those changes with graduation rates. *If graduation rates are improving because they are enrolling different types of students, we should see no improvements in graduation rates after statistically removing the changes that would be expected based on changes in students' background characteristics over time.*
- **Are graduation rates improving because of changes in CPS high schools?** Each of the changes discussed could affect the high school graduation rate without high schools changing their effectiveness in educating students. Often, what people really want to know is whether high schools are doing a better job educating their students. There have been a number of high school policies implemented over the last two decades that could have affected graduation rates. New graduation requirements were put in place in 1997, which other research has shown lowered graduation rates for the class of 2001.¹⁵ The number of high schools in the city has doubled during this time period, with new small schools, charter schools, selective enrollment schools, and contract schools opening, as well as opening International Baccalaureate programs in a number of neighborhood high schools; these schools and programs tend to have higher graduation rates, on average, than other schools.¹⁶ Since 2009, the district has encouraged schools to make use of early warning indicators aimed at getting more students on-track in ninth grade, and CPS has made data reports available for monitoring and intervening with students who miss classes or are beginning to show signs of failure.¹⁷ Schools that were successful in raising freshman on-track rates when these data were made available showed higher graduation

¹³ Allensworth (2005); Roderick et al. (2005); Allensworth & Miller (2002).

¹⁴ Luppescu et al. (2011).

¹⁵ Montgomery & Allensworth (2010); Allensworth, Nomi, Montgomery, & Lee (2008).

¹⁶ Sparte & de la Torre (2010); Booker, Sass, Gill, & Zimmer (2008); Coca et al. (2012).

¹⁷ Allensworth (2013).

rates four years later, when those cohorts of freshmen graduated.¹⁸ At the same time, the district also encouraged schools to get students who failed classes back on-track to graduate through credit recovery, and also provided data reports that made it easy for schools to see which students needed to make up credits.¹⁹

Along with changes in district policies, many high schools have partnered with nonprofit organizations over the last decade whose goal has been to support students in school so that they have higher grades, better attendance, fewer disciplinary problems, higher test scores, and better readiness for college. These include such organizations as City Year, OneGoal, Umoja, Gear Up, Collegiate Scholars, and Becoming a Man. Many of these groups either started during this time period, or greatly expanded to work with more schools or specifically with high schools during this time. A recent evaluation showed that OneGoal, for example, was shown to have had a significant impact on the graduation rates of its participants.²⁰

Changes in high school graduation rates that cannot be explained by diploma quality, methodological issues, or the characteristics of students entering CPS high schools could reasonably be attributed to changes in CPS high schools, and the supports that students receive from their school and the organizations partnering with their school. **Chapter 4** examines the potential influence of changes in the types of high schools students attend, the number of credits that students take in ninth grade, and improvements in ninth-grade pass rates and GPAs on graduation rates. *If schools are doing a better job educating and supporting students, we should see improvements in students' attendance, grades, and course pass rates over time that correspond with subsequent improvements in graduation rates.*

¹⁸ Roderick, Kelley-Kemple, Johnson, & Beechum (2014).

¹⁹ Allensworth (2013).

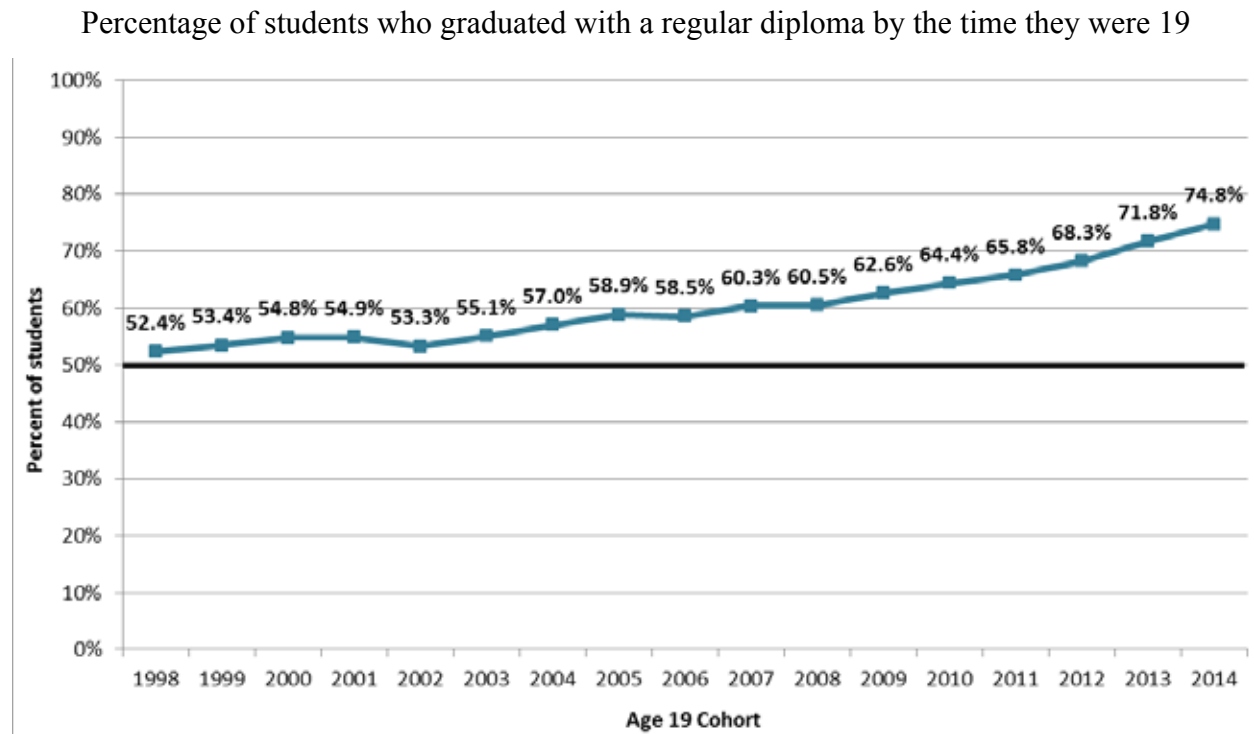
²⁰ Kautz & Zanoni (2014).

Chapter 1: How Much Have Chicago's High School Graduation and On-Track Rates Improved?

Graduation rates have increased considerably in Chicago's high schools. In this report, graduation trends are calculated based on students' age cohort, using only students who entered CPS high schools as freshmen and following them until they turn 19; this allows cohorts to be comparable over time, despite changes in grade promotion criteria (see inset box, *Age Cohorts Are More Comparable over Time than First-Time Freshman Cohorts*). Graduation rates have increased by 22.4 percentage points over the last 16 years, from 52.4 percent among students who turned 19 in 1998, to 74.8 percent in 2014 (see Figure 2).²¹

²¹ These rates are the best estimate that we can make in a way that is comparable over time. As discussed in Appendix B, data available in recent years suggests that the true 2014 rate is most likely around 73 percent but could actually be as low as 71 percent due to uncertainty about students coded as transfers out of the district. We do not have data to discern a lower bound or best estimate for most of the prior cohorts, and so cannot make these estimates for other years. As discussed further below, issues in miscoding transfer students could account for the rise in graduation rates observed from 2004 to 2008. These issues could not account for most of the improvements observed over the entire span, and do not explain the improvements observed since 2009.

Figure 2: Graduation Rates over Time by Age Cohort



Note: Cohorts include all students who attended ninth grade in CPS. This report calculates graduation rates based on students' age rather than the year they started high school to address cohort fluctuations that result from changes in the elementary school grade promotion standards. These rates may be an overestimate of the true graduation rate because of uncertainty about whether students who were coded as transferring out of CPS really did transfer. We estimate that, due to this issue, the true 2014 graduation rate is most likely around 73 percent but may be as low as 71 percent. Data are not available to calculate a lower bound for most of the prior years.

Over the last 16 years there have been regular periods of improvement in the graduation rate, interspersed with a year or two of setback or no growth. There were slight increases in graduation rates from 1998 to 2000, and then a flattening and dip in 2001 and 2002. They rose again slightly in each year from 2003 to 2005, and vacillated slightly from 2005 to 2008. The largest yearly increases occurred in the last six years; since 2009 there have been continual increases in graduation rates of at least 2 percentage points each year.

Age Cohorts Are More Comparable over Time than First-Time Freshmen Cohorts

Graduation rates are usually constructed based on cohorts of first-time ninth-graders, following students from the year they begin high school to see how many graduate four to five years later. However, ninth-grade cohorts are not comparable over time in CPS. The district has promotion requirements in grades 3, 6, and 8 that students must meet to move onto the next grade level. These requirements have changed many times over the last two decades, with the result being that large numbers of students with the lowest levels of achievement are either held back or moved ahead at different rates in different years (see Figure 17 in Chapter 3). This causes some cohorts to have higher graduation rates simply because many low-achieving students did not move on to ninth grade with their age peers, while other cohorts have lower graduation rates for the opposite reason.

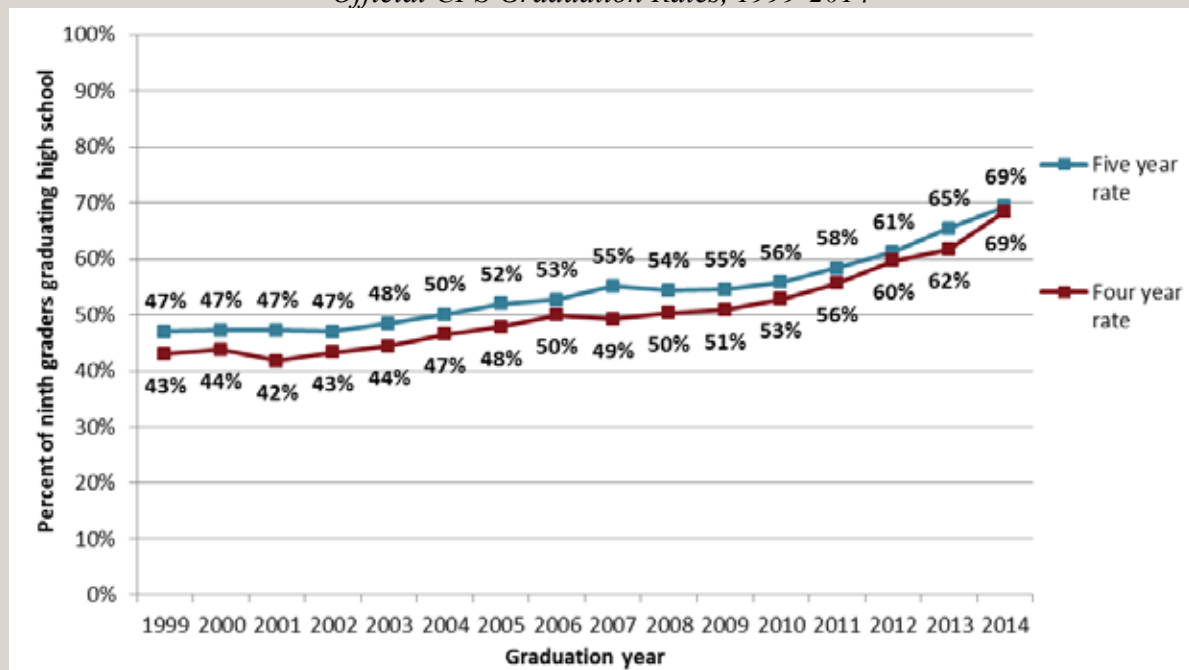
Rather than following cohorts of students who enter ninth grade for the first time together, this report groups students by age—following students who turned age 14 in the same year until they turned 19. All students who enrolled as a first-time ninth-grader in a CPS high school, including charter and selective enrollment high schools, are included in the statistics. This represents the same students that are in ninth-grade cohort graduation rates, but students are grouped with students of the same age rather than with students who began high school in the same year. Most students begin ninth grade at age 14 and graduate at age 18. However, because many elementary school students are retained in grade at some point in CPS and do not begin ninth grade until age 15 or older, we follow students until age 19 to allow students who enter high school at age 15 four years to graduate. These issues are discussed further in Chapter 3 and in Appendix B.

CPS-Calculated Graduation Rates and Why They Differ from Consortium-Calculated Rates

The district's official high school graduation rate has improved considerably over time. The five-year graduation rate reached 69 percent in 2014, an incredible rise compared to the prior year (65 percent) and a continuation of a trend that had been occurring for a number of years (see Figure A).^E Likewise, the four-year graduation rate increased from 43 percent in 1999 to 69 percent in 2014.

Figure A: Official CPS Graduation Rates Have Increased Considerably Over the Past 16 Years

Official CPS Graduation Rates, 1999-2014



Source: Chicago Public Schools. (2015, July 20). Cohort dropout and graduation rates. Retrieved from <http://www.cps.edu/SchoolData/Pages/SchoolData.aspx>. Five-year graduation rates and four-year graduation rates are based on the year of graduation; therefore, they are based on ninth-grade cohorts that are one year apart. To compare the five-year and four-year graduation rates for the same students, the five-year rate should be compared to the four-year rate from the prior year. In fall 2015, CPS revised its graduation rates down in response to concerns about the accuracy of some of the data records. However, the revisions were only done for the most recent years, so we cannot use them to show long-term trends.

As described in Appendix B, there are many ways that graduation rates can be calculated. When calculating graduation rates for this report, we used decision rules that produce the most accurate rates that are also the most comparable over time. To do this, we made some decisions that are different from the decision rules used by the district. There are differences in terms of: 1) how cohorts are defined (by age instead of grade); 2) how to count students who transfer out of the district without a validation of their transfer (we treat these students as valid transfers); 3) how to count students who receive a diploma from an alternative school (we do not count these students

as graduates). Some of these decisions may seem counter-intuitive—please read Appendix B for the rationale for these decisions. The district also includes any student who was ever in ninth grade, even if the student was enrolled for just one day. We only include students who were enrolled in ninth grade at the start of the year (by the 20th day), *or* transferred into the district after the start of the year and remained in CPS long enough to receive grades for at least one semester.

When making decisions about how to calculate graduation rates, there are always trade-offs in terms of accuracy, consistency, simplicity, and usefulness for accountability.^E For CPS, two of the most important factors are accountability and simplicity. The district needs to make sure that schools do not hide their dropouts as transfer students. They also need to use ninth-grade cohort methods so that they can calculate rates for specific schools—age cohorts are not useful for school-level statistics. In contrast, the factors that we care most about for this study are accuracy and consistency over time. Appendix B describes some of the methodological issues that influenced our decisions about which methods to use for calculating graduation rates for the purpose of examining trends over time.

^E Chicago Public Schools. (n.d.).

Graduation rates can rise because more students are earning diplomas and fewer students are dropping out of school, but not all students have one of these two outcomes. There are a number of outcomes other than graduate or drop out that students could have by the time they reach age 19, and these outcomes can also affect the resulting graduation rate statistics. Figure 3 and Table 1 show students' status at age 19 for many possible outcomes—whether they had graduated, earned an alternative diploma, dropped out, remained enrolled in school, were recorded as transferring out of the district, or had another outcome (e.g., incarceration, institutionalization, or death). Each of these trends is described below:

Students earning a regular diploma. Among the students who attended CPS for the ninth grade and turned 19 in 1998, only 43 percent had obtained a regular diploma by age 19. By 2014, that number had increased to 62 percent. There has been a large rise in the percentage and number of students earning a regular diploma over time, out of all students who enter ninth grade in CPS. Over 5,000 more students earned a regular diploma in the cohort that turned age 19 in 2014 compared with cohorts before 2003. It is important to note that this percentage is not the same as the graduation rate because students who transfer out of the district or experience another outcome (i.e., institutionalization, incarceration, or death) are removed from the denominator before calculating the graduation rate.

Dropouts. The percentage of students in each cohort recorded as dropping out of high school by age 19 has declined dramatically over the last 15 years, falling from 35 to 11 percent of students. The number of students dropping out has also declined dramatically, from over 10,000 students in the cohort that turned 19 in 1998 to just over 3,000 students in the 2014 cohort. The rise in students earning a diploma has resulted from the decline in dropout rates, rather than a decline in other outcomes.

Students still in school at age 19. Some students are still in school at the point that the graduation rate is calculated for their cohort. These students are counted as non-graduates in the graduation rate statistics. If students are moving through high school faster—with fewer students retained in grade or taking more than four years in high school—graduation rates can rise without a change in dropout rates. However, the opposite has occurred in CPS, working against graduation rates. There have been small increases in the percentage of students who are still enrolled in school at age 19, from 4 to 7 percent of students. These students might eventually graduate, but they are counted in the same way as dropouts for the graduation rate statistic.

Alternative diplomas. There are also students who do not obtain a regular diploma, but obtain a diploma from an alternative school or a GED certificate. We count these students as non-graduates, because it is not clear that the same standards apply for their diplomas as in regular schools, although valid arguments could be made to count them with other graduates.²² The percentage of students earning an alternative diploma has increased slightly, by about 2 percentage points. One reason so few students in these cohorts earn alternative diplomas is that they are only followed until age 19; students can enroll in alternative schools until age 21.

Students who transfer out of the district. Another potential outcome for students who attend ninth grade in CPS is to transfer to other school districts during high school. In graduation rate calculations, students who transfer out of the district are removed from the denominator of the statistic because their outcomes are unknown. Yet, there is often concern that schools can boost their graduation rates by miscoding dropouts as having transferred to another school district. There are a number of issues with validating transfers—ensuring that students actually did transfer to another district—and these issues are discussed and examined more thoroughly in Appendix B. By examining the trends in transfer rates, we can gauge the extent to which changes in this outcome could potentially have influenced the trends in graduation rates.

There was an increase in the percentage of students coded as transferring from the district, growing from 13 percent of students in each cohort prior to the 2003 cohort to 18 percent of the cohort in 2008. This increase could have affected the graduation rates during those years if students who transferred were more likely to drop out than other students, or if schools were misclassifying dropouts as transfer students at higher rates during these years.²³ If true, this could potentially explain all of the 3 percentage point increase in graduation rates that occurred from 2003 to 2008. This possibility is described more thoroughly in Appendix B. During the last four years, transfer rates have dropped each year, with 14 percent of students transferring from the 2014 cohort, compared to 18 percent in 2010. Thus, the most recent rise in graduation rates could not have come from coding more students as transfers than in the past.

²² CPS and the Illinois State Board of Education count students who received diplomas from alternative schools and programs as graduates.

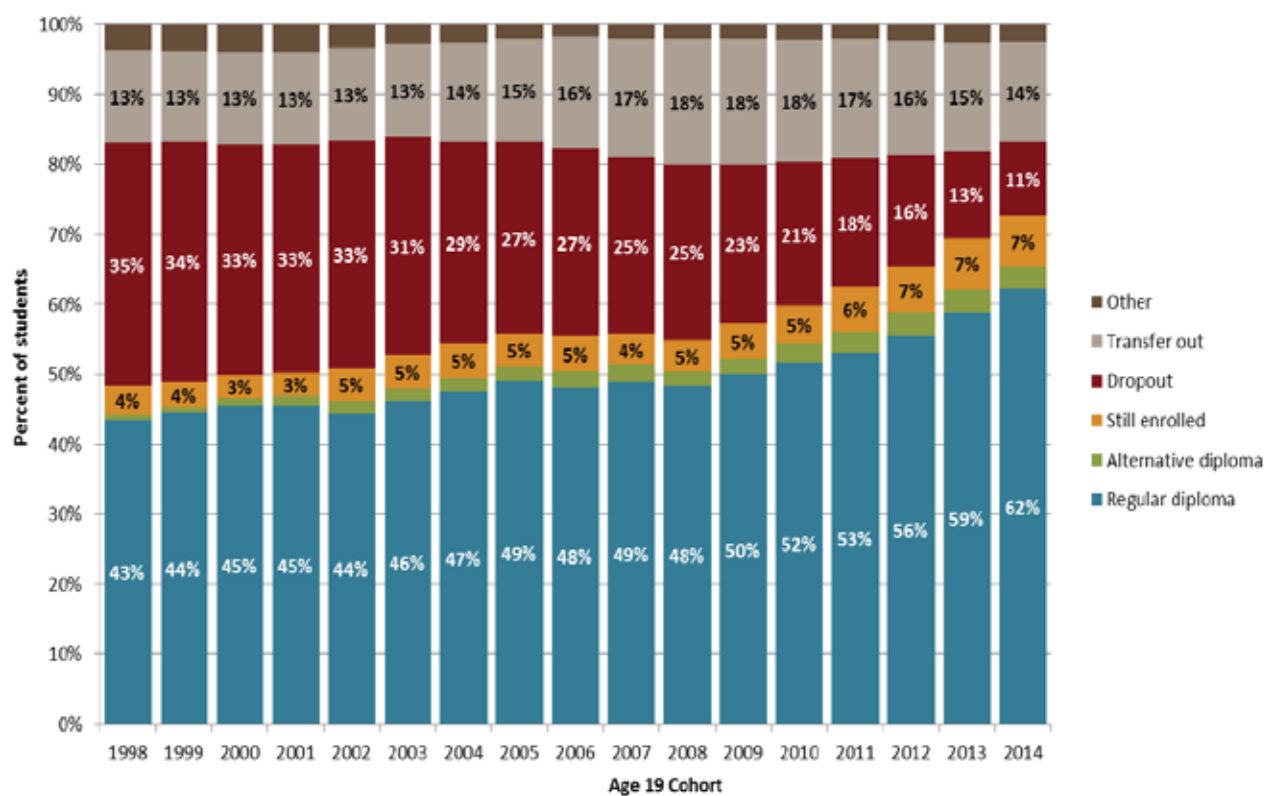
²³ Appendix B shows how the achievement of students who transferred out of the district has changed over time, an indication of whether there has been a systematic change in the type of students recorded as transferring out of the district.

Institutionalization, incarceration, or death. There are also students who cannot graduate because of institutionalization, incarceration, or death. We do not include these students when calculating graduation rates because they could not graduate.

The changes in students transferring from CPS, earning alternative school diplomas, remaining enrolled in school, and experiencing other outcomes have been fairly modest relative to the rise in the proportion of students receiving a diploma. Even if all transfer students and alternative diploma recipients are counted as non-graduates, along with students still in school, known dropouts, and students with other outcomes (e.g., institutionalization, incarceration, or death), there is still nearly a 20 percentage point increase in the percentage of students earning a diploma. Most of that increase has occurred in the last six years, and reflects real change in graduation outcomes for thousands of students.

Figure 3: A Greater Proportion of Students Are Earning Diplomas, Even if All Transfer Students Are Counted as Non-Graduates

All possible outcomes of students over time, including those who transferred to other districts



Note: The proportion of students who earn a regular diploma is not the same as the graduation rate because students who transfer out of the district or experience another outcome (i.e., institutionalization, incarceration, or death) are removed from the denominator of the graduation rate statistic. Percentages do not always sum to 100 due to rounding error. See Table 1 for the number of students with each outcome.

Table 1: The Number of Students Earning a Diploma Has Increased as the Number of Dropouts Has Decreased Dramatically

Number of students beginning ninth grade and achieving each outcome by age 14 cohort

Cohort: year in which turned age 14	Cohort: year in which turned age 19	Number of students in the cohort	Outcome at age 19					
			Earned a regular diploma	Earned an alternative diploma	Dropped out	Remained enrolled	Transferred out of CPS	Other ¹
1993	1998	29,861	12,988	220	10,363	1,234	3,984	1,072
1994	1999	30,748	13,678	250	10,569	1,101	3,975	1,175
1995	2000	29,784	13,530	369	9,835	951	3,930	1,169
1996	2001	29,585	13,454	417	9,646	1,005	3,891	1,172
1997	2002	28,895	12,840	482	9,407	1,377	3,820	969
1998	2003	28,883	13,335	526	8,959	1,390	3,885	788
1999	2004	29,294	13,909	578	8,443	1,471	4,149	744
2000	2005	29,126	14,266	644	8,005	1,319	4,295	597
2001	2006	30,030	14,449	664	8,015	1,558	4,816	528
2002	2007	31,063	15,172	786	7,832	1,354	5,305	614
2003	2008	31,590	15,292	626	7,928	1,435	5,662	647
2004	2009	32,347	16,188	688	7,311	1,677	5,852	631
2005	2010	31,594	16,336	868	6,494	1,686	5,535	675
2006	2011	31,242	16,603	936	5,722	1,982	5,349	650
2007	2012	31,969	17,751	1,047	5,120	2,087	5,227	737
2008	2013	30,307	17,833	1,003	3,791	2,223	4,688	769
2009	2014	29,473	18,341	933	3,126	2,135	4,192	746
2010	2015	28,735	Graduation data not yet available: used for on-track rate analyses					
2011	2016	28,076	Graduation data not yet available: used for on-track rate analyses					
2012	2017	28,478	Graduation data not yet available: used for on-track rate analyses					

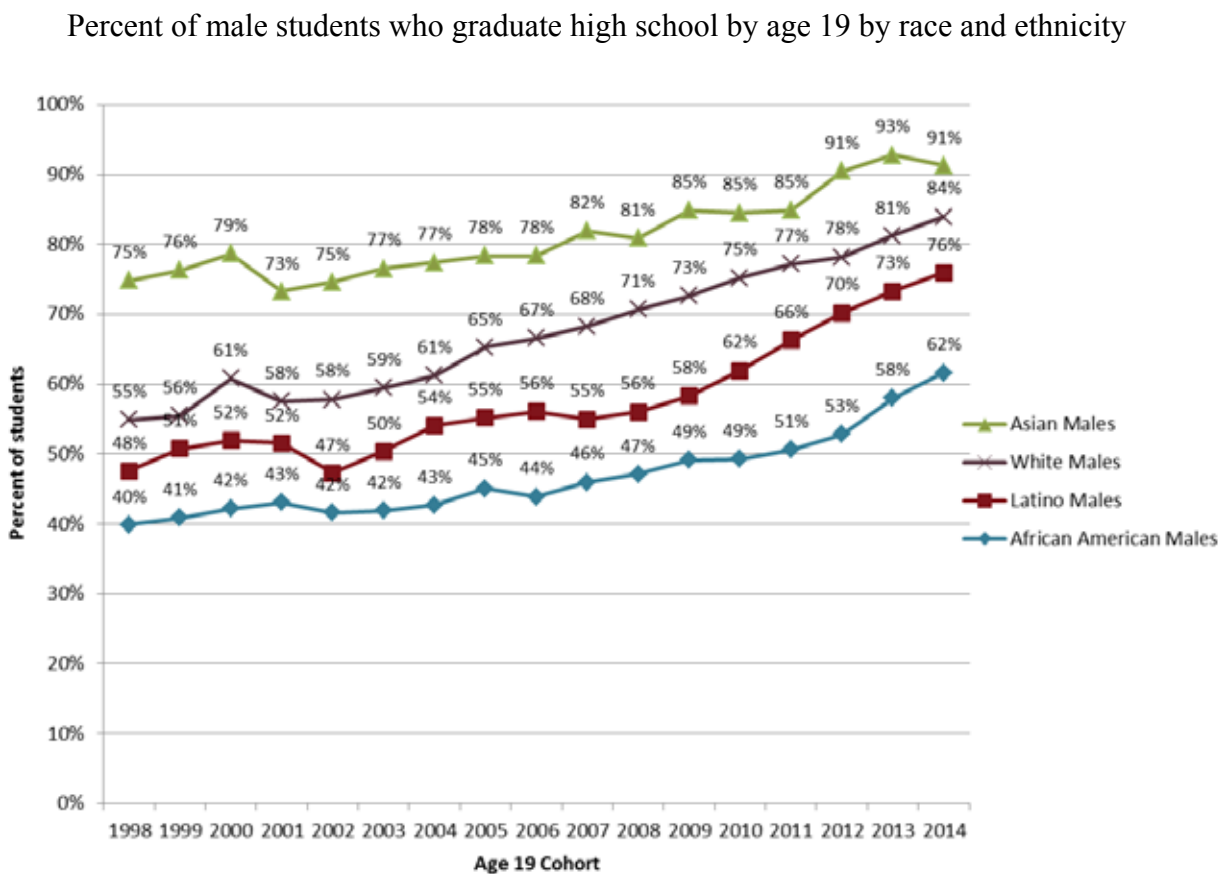
1. Other outcomes include incarceration, institutionalization, and death. The total number of students in the third column is equal to the sum of students in each of the columns to the right.

Graduation Rates by Subgroup

Graduation rates have improved over time for students of differing gender, race and ethnicity, socioeconomic status, and special education status. However, not all groups have seen improvements during the same periods of time.

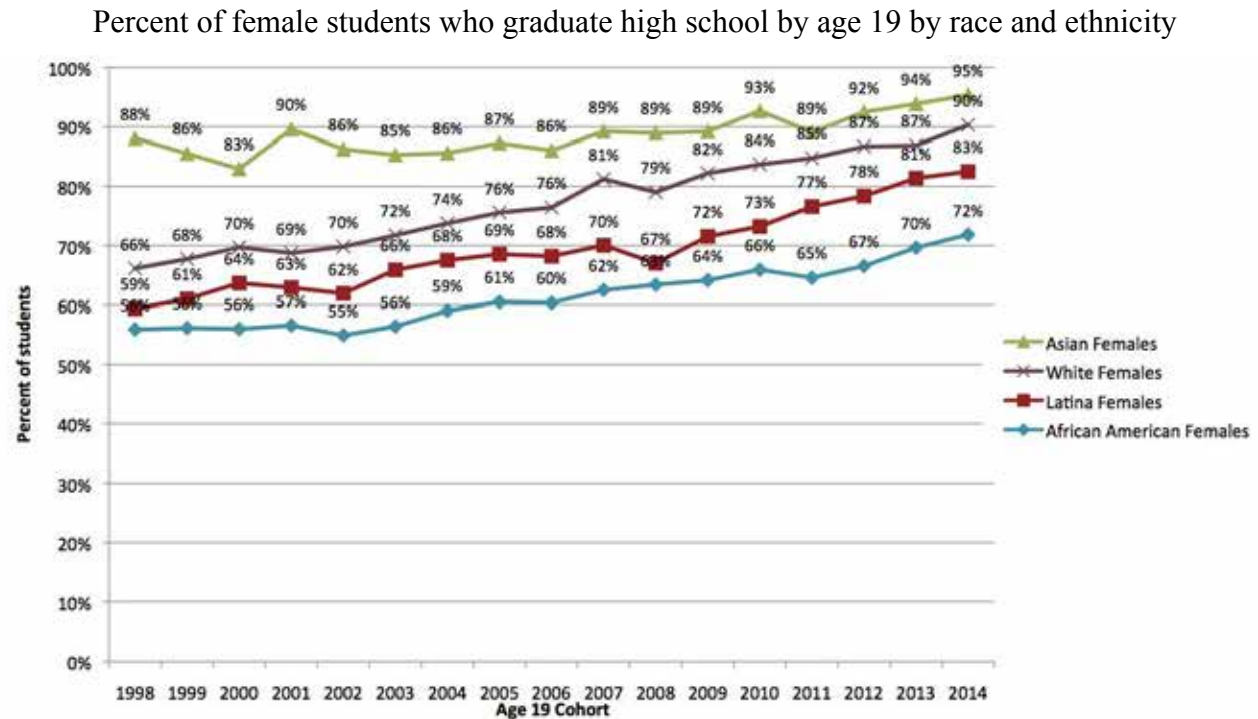
As shown in Figure 4 and Figure 5, there have been improvements in graduation rates for students of all racial/ethnic backgrounds, and for both male and female students. The improvements have been the largest for white and Latino students—the gap between their graduation rates and those of Asian students has narrowed considerably, even as graduation rates for Asian students have improved. Graduation rates for Latino students were only at 48 percent for males and 59 percent for females in the late-1990s, and now graduation rates are at 76 percent for male Latino students and 83 percent for female Latina students. African American students consistently have had the lowest graduation rates, and they showed the least improvement in graduation rates over time. In fact, graduation rates for African American males remained below 50 percent until 2011. However, since 2011 graduation rates have risen more quickly, reaching 62 percent by 2014. Graduation rates have also risen from 56 to 72 percent among African American females. Asian males nearly caught up to the graduation rates of Asian females, with both groups showing graduation rates of over 90 percent. Gender gaps persist with other racial/ethnic groups, but the gender gap has narrowed for each.

Figure 4: Graduation Rates Have Improved for Male Students of All Races and Ethnicities



Note: The proportion of students in each demographic group also changed over time; see Chapter 3.

Figure 5: Graduation Rates Have Improved for Female Students of All Races and Ethnicities



Note: The proportion of students in each demographic group also changed over time; see Chapter 3.

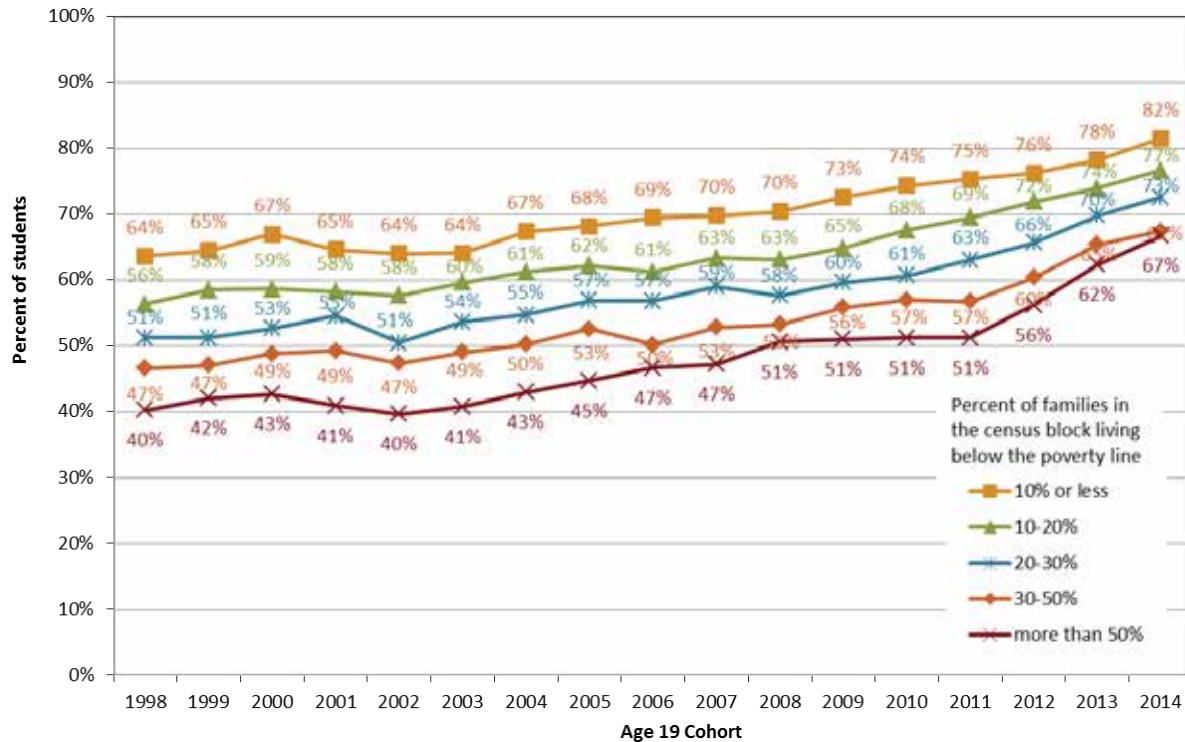
Graduation rates have improved for students from all neighborhood poverty levels

The improvements in graduation rates have not been confined to higher- or lower-income neighborhoods; students in all types of neighborhoods have shown improvements in graduation rates. Figure 6 displays graduation rates by poverty levels in the census blocks where students live.²⁴ The top line represents students who lived in census blocks where less than 10 percent of the families in that census block lived below the poverty line; these are the students who lived in the neighborhoods with the least poverty relative to other students in the district. The line at the bottom of the figure represents the students who lived in the census blocks with the highest poverty, where more than 50 percent of the families lived below the poverty line. Throughout the last 16 years, graduation rates have been higher among students who live in neighborhoods with lower concentrations of poverty. However, the gaps in graduation rates based on neighborhood poverty levels have grown smaller—particularly in the last four years. The gap between the graduation rates of students living in neighborhoods with the lowest poverty to those in neighborhoods with the highest poverty has been reduced by one-third, falling from 24 percentage points in 1998 to 15 percentage points by 2014.

²⁴ Census blocks are defined by the U.S. Census Bureau and, in large urban areas such as Chicago, typically represent a square city block. See <http://blogs.census.gov/2011/07/20/what-are-census-blocks/>

Figure 6: In Recent Years, Graduation Rates Improved the Most among Students from the Highest-Poverty Neighborhoods

Percent of students who graduate high school by age 19 by their neighborhood poverty level



Note: Students are classified into census blocks based on their residence when they first entered ninth grade. The proportion of students living in each neighborhood poverty category also changed over time (see Chapter 3).

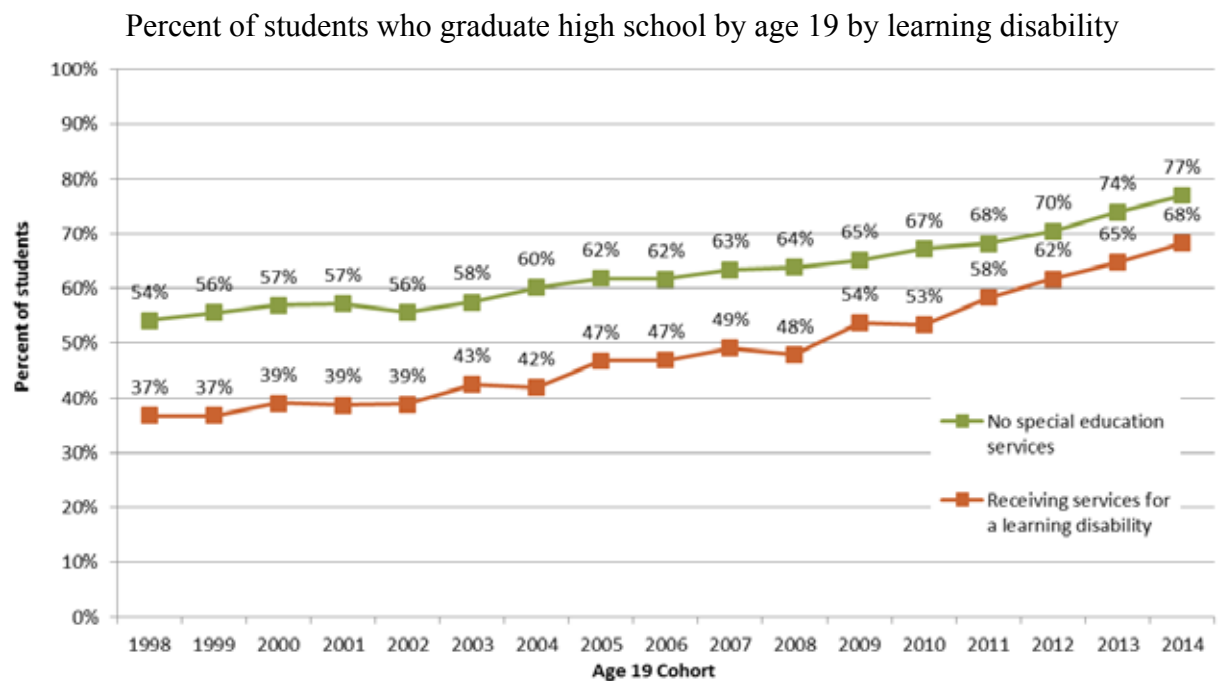
Graduation rates have improved more for students with identified learning disabilities than students without identified disabilities

Students with learning disabilities have historically had lower graduation rates than students without identified disabilities.²⁵ While graduation rates for students with identified disabilities continue to be lower than rates for other students, they have shown a 31 percentage point increase over the past 16 years, increasing from 37 percent in 1998 to 68 percent in 2014 (see Figure 7).²⁶ The gap in graduation rates between students with an identified disability and students not identified as having a disability has been cut in half during this time, from 17 percentage points in 1998 to 9 percentage points in 2014.

²⁵ See Gwynne, Resnick, Hart, & Allensworth (2009) for an analysis of the lower on-track and graduation rates among students with identified disabilities.

²⁶ There are insufficient numbers of students with disabilities other than a learning disability to display stable subgroup graduation rates over time.

Figure 7: Graduation Rates Have Improved for Students with Diagnosed Learning Disabilities



Graduation rates at non-charter schools have almost caught up to those at charter schools, while both remain far below selective enrollment schools

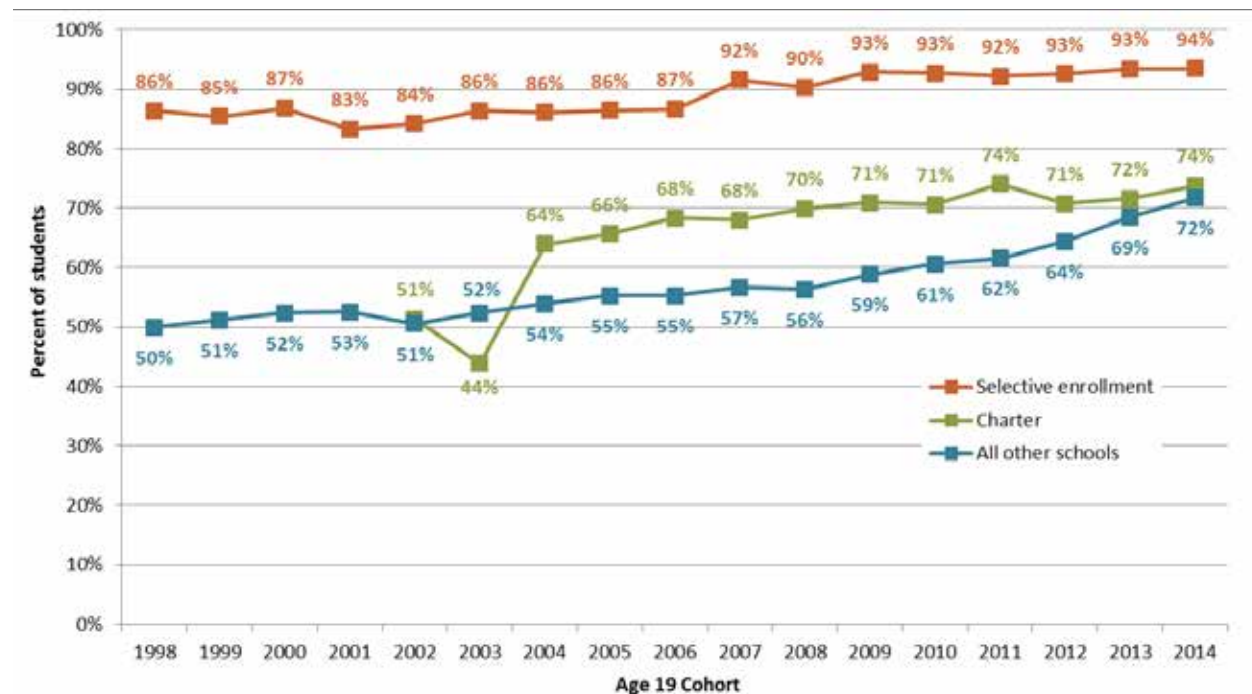
Graduation rates at selective enrollment high schools have always been much higher than those at neighborhood schools; they only admit high-achieving students, who are very likely to graduate. Still, until 2007, graduation rates among students at selective enrollment schools were less than 90 percent (see Figure 8). Graduation rates among students in selective enrollment schools have shown slight improvements off and on beginning in 2007, hovering around 93 percent in recent years.

Charter high schools did not exist in CPS during the early 1990s. Graduation rates in charter high schools first can be calculated for students who turned 19 in 2002. At that time, the graduation rate for students in charter schools was similar to the graduation rate of students in non-selective enrollment/non-charter schools. The graduation rate of students enrolled in charter high schools jumped in 2004. This increase occurred for two reasons: 1) graduation rates increased with the 2004 cohort in the few charter schools that had students in the 2002 and 2003 cohorts; and 2) new charter schools opened with higher graduation rates, and their first graduating classes are represented in the 2004 cohort. As a result, in 2004, graduation rates among students at charter schools were 10 percentage points higher than those at other non-selective enrollment schools. Graduation rates at both charter schools and other non-selective enrollment schools increased from 2004 to 2014, but they increased more at non-charter/non-selective schools than at charter schools. As a result, graduation rates at non-charter, non-selective enrollment schools were close to those at charter schools by 2014 (72 percent compared to 74 percent).²⁷

²⁷ Four-year freshman cohort graduation rates at non-charter, non-selective enrollment schools are now equivalent to those at charter schools. Charter schools' graduation rates are higher when students are followed for five years or until age 19, as shown.

Figure 8: Graduation Rates Have Improved the Most at Regular High Schools

Percent of students who graduate high school by age 19 by school type



Note: The graduation rates shown here group students with the first school they enrolled in for ninth grade, but count students as graduates if they graduate from any CPS high school, excluding alternative schools.

Ninth-Grade On-Track Rates

Because of the time it takes for students to progress through high school, the most recent group of students for whom we can calculate a graduation rate entered high school a number of years ago—most of the students who turned 19 in 2014 started high school in 2009. Given the strong relationship between ninth-grade course performance and on-time graduation, trends in recent freshman on-track rates can provide a sense of whether high school graduation rates are likely to continue to improve. A student is on-track for high school graduation if she has failed no more than one semester of a core course and earned enough credits to be promoted to tenth grade by the end of the school year (CPS requires 5 credits). Prior research showed that students who were on-track at the end of ninth grade were three and a half times more likely to graduate high school in four years than students who were off-track at the end of ninth grade.²⁸

²⁸

Roderick et al. (2014); Allensworth & Easton (2005).

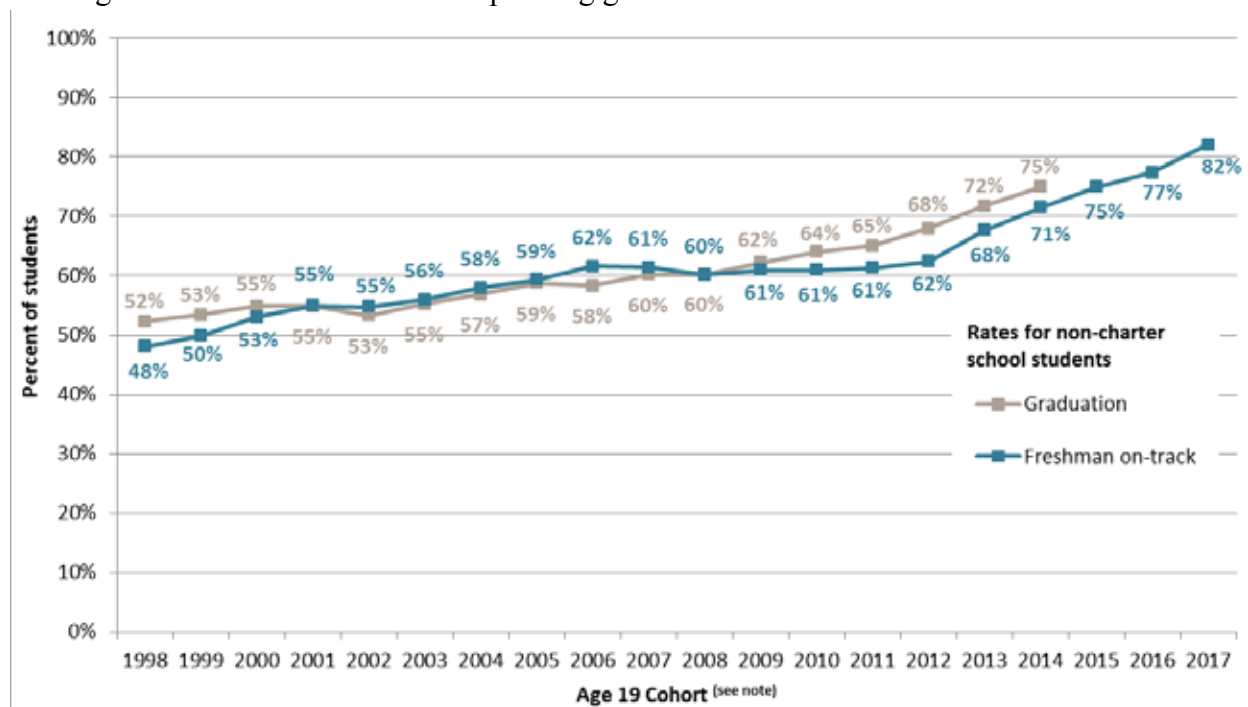
As shown in Figure 9, freshman on-track rates have risen considerably in Chicago's non-charter/non-selective schools, from 48 percent among students who eventually turned 19 in 1998 to 82 percent among students who will turn 19 in 2017. Charter schools were not required to submit course performance data to CPS, so we are unable to calculate their students' on-track rates. Among non-charter school students, there was a period of fairly sustained improvements in ninth-grade performance from the cohort of students who were 19 in 1998 through 2006, where freshman on-track rates increased by about 1-2 percentage points each year. Following this period, on-track rates showed little improvement, and even declined, with the subsequent six cohorts. But beginning with the cohort of students who turned 19 in 2013, there have been improvements in freshman on-track rates of 2-5 percentage points each year.

The on-track line on Figure 9 shows that there have been some periods in which the improvements in on-track rates were mirrored by similar improvements in graduation rates for those same students, but there have been other periods when they diverged. In the 1990s, ninth-grade on-track rates increased more so than graduation rates of the same cohorts of students. Following this period, changes in graduation rates tended to follow very closely with changes in on-track rates. Beginning with the cohort of students who were 19 in 2009, graduation rates started increasing while on-track rates remained stagnant. When on-track rates started improving with the 2013 cohort, graduation rates of the same cohorts continued to show sizable gains.

As with graduation rates, freshman on-track rates are calculated without students who transferred to other districts during the ninth-grade year. Thus, like graduation rates, they could rise if more students were miscoded as transfer students instead of dropouts. As shown in Figure 10, transfer rates during the ninth-grade year have risen slightly, but only by about 1 percentage point from the 1998 cohort to the 2017 cohort. Figure 10 also shows how dramatic the rise in on-track rates has been, by contrasting on-track rates with off-track rates. In the 1990s, students were about as likely to end the ninth-grade year off-track as on-track. By the 2010s, students were 3-4 times more likely to be on-track than off-track.

Figure 9: Freshman On-Track Rates have Increased Considerably in the Last Five Years

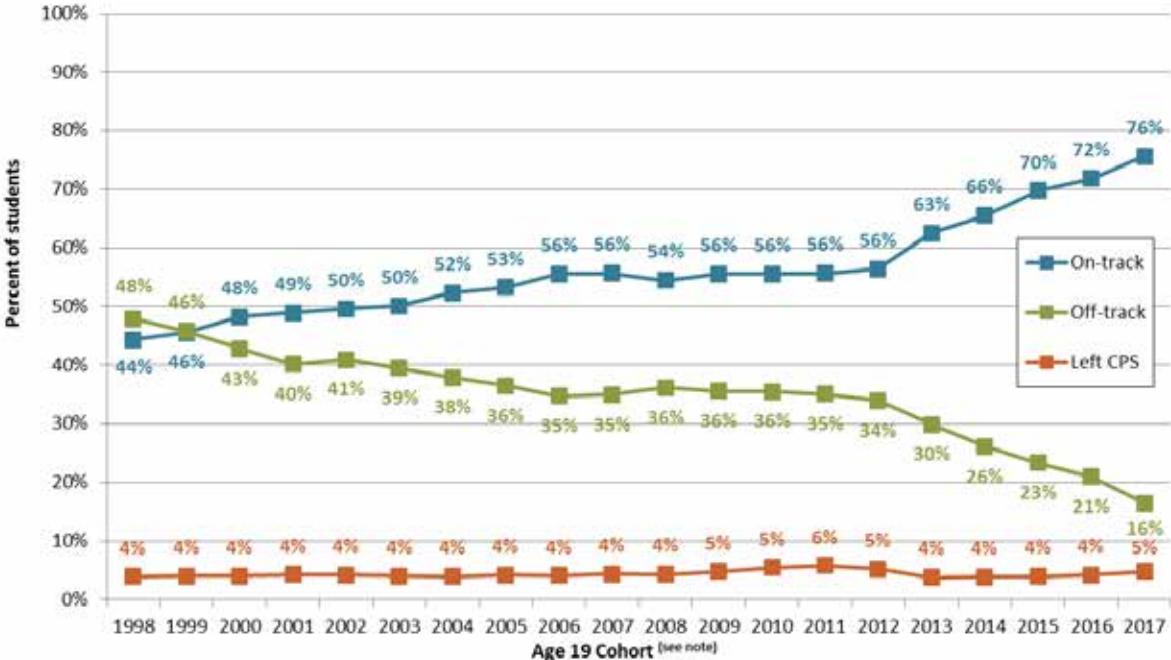
Ninth-grade on-track rates and corresponding graduation rates for *students not in charter schools*



Note: On-track status is determined in the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. On-track rates are only shown through the cohort of students who turned 19 in 2017 (who were 14 years old in 2012) because students in later cohorts would not yet have entered high school if they were two or more years old-for-grade (i.e., retained twice in elementary/middle school). Charter schools were not required to provide data on their students’ course performance to CPS, so we are unable to calculate the on-track rate including charter school students. Students who were enrolled in a charter school for ninth grade or who transferred out of CPS in ninth grade are not included in the on-track rate or the graduation rate shown in this figure. Students who transfer out of CPS after ninth grade are included in the on-track rates in this chart, but not in the graduation rates.

Figure 10: Freshman On-track Rates have Been Increasing Over Time

Percent of students enrolled in non-charter schools who were on-track, off-track, or left CPS at the end of their first year of ninth grade



Note: On-track status is determined in the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. The percentages for each year do not sum to 100 percent because there are students each year for whom course information is not available for both the fall and spring semesters. Students at charter high schools are not included in this figure because transcript data was not available from charter schools to calculate on-track rates.

Chapter 1: Summary

Both graduation and on-track rates have increased considerably in CPS over the last 20 years, with the largest increases occurring in the most recent years. Improvements have occurred for students of all racial/ethnic and economic backgrounds, and gaps in graduation rates by gender, neighborhood poverty, and learning disability status have all declined. While graduation rates have improved for students of all racial groups, improvements were less strong for African American students than for white and Latino students, until the most recent years.

While graduation rates have improved, a quarter of students who begin high school in CPS are not graduating by the time they are 19 years old. Only Asian students have graduation rates above 90 percent, and only 62 percent of African American males graduate by the time they are 19. The district has made extraordinary progress with graduation rates, but CPS is still far from graduating all of its students.

As shown in this chapter, most of the improvements in graduation rates could not have resulted from greater numbers of dropouts being miscoded as transfer students, except between 2006-08.²⁹ There are many potential factors other than improvements in high school performance that could produce rising graduation rates. The following three chapters examine some of these potential explanations. The first looks to see whether the value of a CPS diploma has changed over time in terms of the types of qualifications with which students are graduating.

²⁹ This does not mean that students are not miscoded, but that the problem does not explain the change in graduation rates over time (except between 2005-08).

Chapter 2: Are CPS Students Graduating with the Same Qualifications as in the Past?

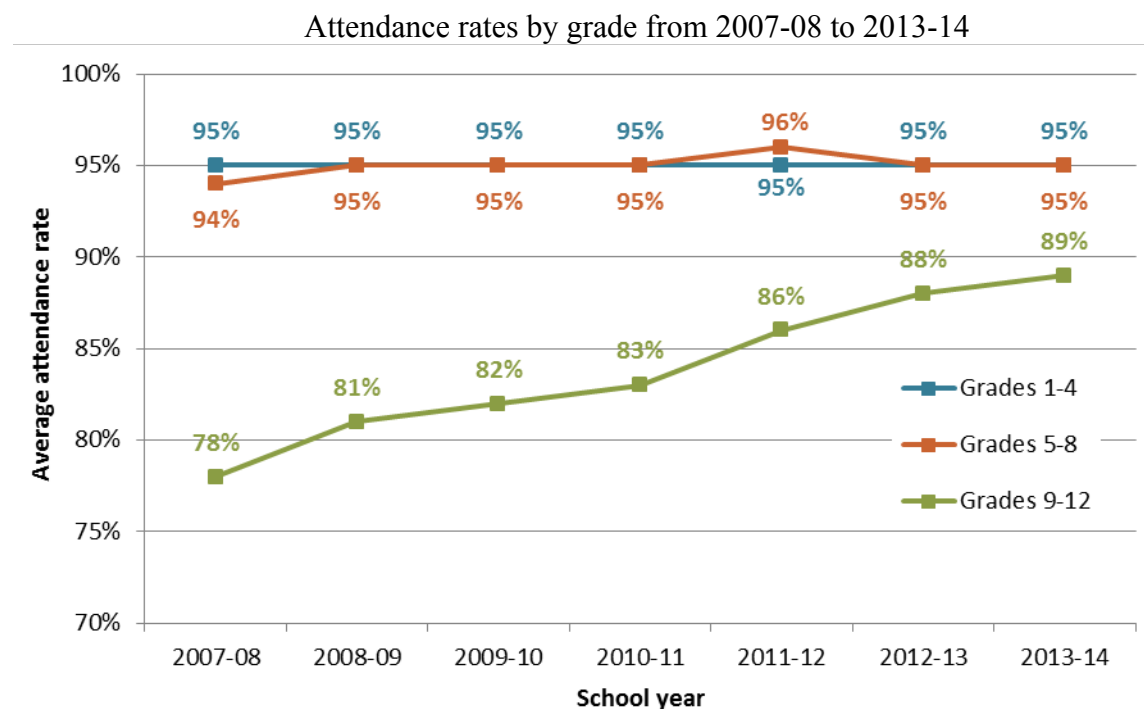
More CPS students are obtaining a diploma over time, but the improvements in diploma receipt could be questioned based on the quality of the education that the diploma represents. It is possible that schools lowered their standards to get more students to graduate, encouraging teachers to pass students in their classes despite weak performance. If schools were passing weaker students on to higher grades, without improving their performance, later cohorts of students should have had a larger proportion of students with weak academic skills and academic behaviors, graduating with easier coursework, over time. However, this is not the case. Not only are many more students graduating each year, but they are doing so with higher achievement levels and more rigorous coursework than graduates in past years.

Attendance rates at CPS high schools have risen considerably over the last five years

Prior research in Chicago has shown that students who drop out tend to have high absence rates.³⁰ If schools were simply keeping low-performing students in school, we would expect to see declines in schools' average attendance as low-achieving students stayed in school longer. However, attendance rates have improved considerably in high schools over the last seven years, even while they remained constant in the earlier grades (see Figure 11). (Because of the change in the student record-keeping system in 2007, attendance rates prior to 2007 are not comparable to later years.) In the 2007-08 school year, the first year that attendance information is available for all students, the average high school student's attendance rate was only 78 percent, equivalent to 40 days of school missed. In other words, a typical high school student missed more than one-fifth of their classes over the course of the year. By the 2013-14 school year, attendance rates had improved considerably, to 89 percent—a great improvement, although it still represents about 19 days of school missed. Attendance rates in high school are much lower than in the earlier grades, but high school students were attending school much more frequently in the 2013-14 school year than six years prior.

³⁰ Allensworth & Easton (2007).

Figure 11: Attendance Rates have Increased in CPS High Schools



ACT scores among graduates have increased

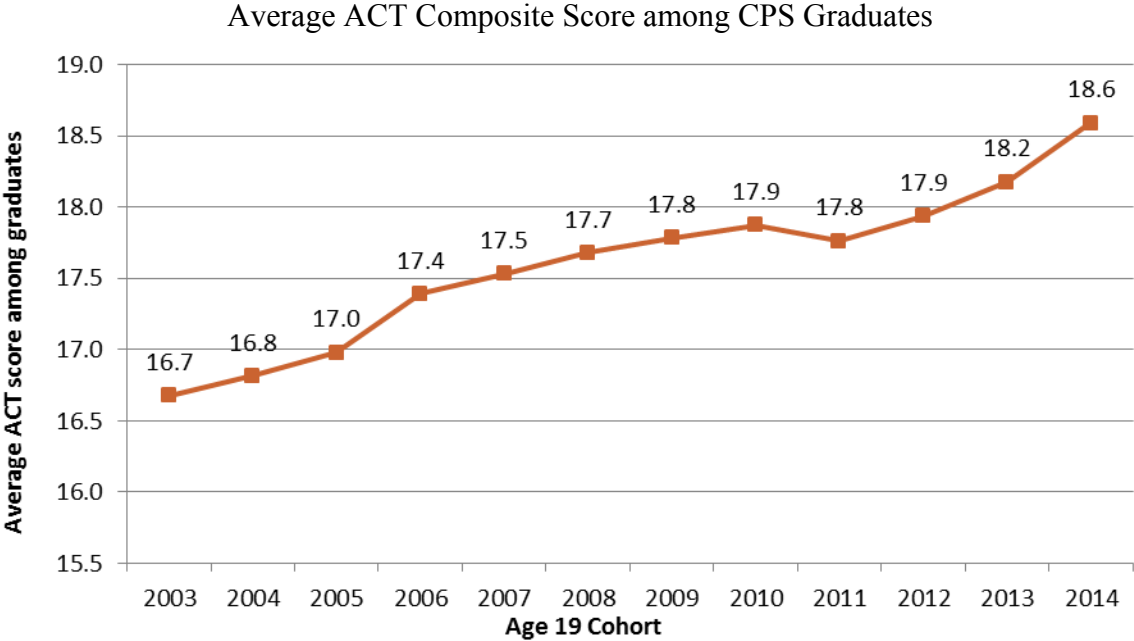
If schools were simply passing students through to graduation, we would expect that the tested achievement levels of students would decline. Schools would be keeping academically weaker students in school longer; if these weaker students stayed in school until the end of the junior year that should depress the average ACT scores. However, that is not the case. The state of Illinois first started requiring all students to take the ACT in 2001.³¹ Among students who turned 19 in 2003, the average ACT score was 16.7 (see Figure 12). In that cohort, only about 12,500 juniors took the ACT, of about 23,500 students in that cohort (see Figure 13). Many more students in the 2014 cohort took the ACT—almost 21,000 of the 24,500 in the cohort. While more students stayed in school through the eleventh grade to take the ACT, average ACT scores did not decline. In fact, they were much higher, with an average composite score of 18.6 (see Figure 12). On average, students’ scores on ACT’s EPAS system tend to improve by just over 1 point per year.³² Thus, average scores rose by the equivalent of almost two years of learning,

³¹ Retrieved from http://articles.chicagotribune.com/2000-06-20/news/0006200270_1_illinois-learning-standards-test-days-students-transcripts

³² ACT’s EPAS system is a series of three standardized tests (Explore, PLAN, ACT) that are designed to assess students’ high school and college readiness. CPS students take the Explore test in eighth or ninth grade, the PLAN in tenth grade and the ACT in eleventh grade.

while testing a larger proportion of students.³³ Furthermore, it was not simply the case that ACT scores rose among high-performing students. A smaller percentage of students scored below an 18 on the ACT in recent cohorts than in earlier cohorts, while more students scored above a 21 on the exam.³⁴

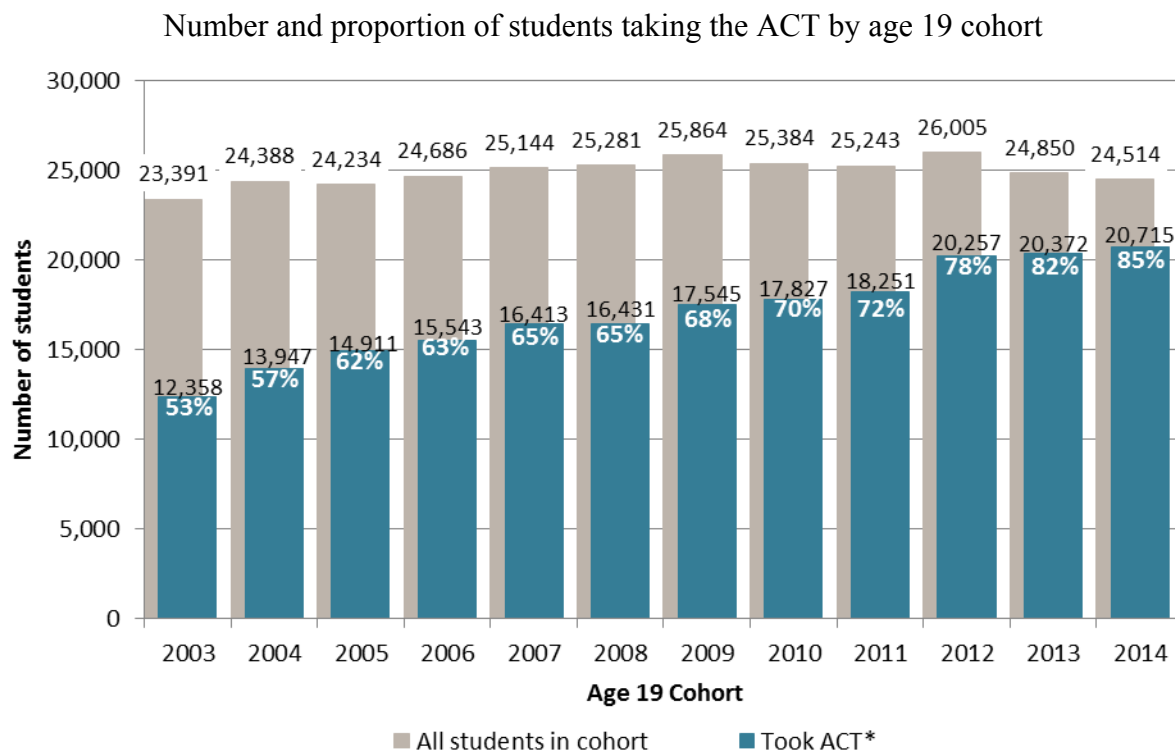
Figure 12: ACT Scores of CPS Graduates Have Improved over Time



³³ For a more rigorous analysis of changes in ACT scores over time, with adjustments for students’ entering skills and an analysis of trends in gains, see Luppescu et al. (2011).

³⁴ A previous Consortium study showed that in the CPS graduating class of 2006, 56 percent of graduates scored below an 18 on the ACT; that had decreased to 49 percent with the class of 2013. Twenty-three percent of graduates in the class of 2006 scored at or above a 21 on the ACT, while 30 percent of graduates scored at or above a 21 (Healey, Nagaoka, & Michelman, 2014).

Figure 13: A Greater Proportion of Students Stay in School Long Enough to Take the ACT



*The white text within the bar represents the *percent* of students in the cohort who took the ACT; the black text above the bar represents the *number* of students from the cohort who took the ACT. Students who permanently transferred out of CPS are not included in this figure.

More students are taking advanced coursework than in the past

CPS requires more rigorous coursework than is required by the state of Illinois. In 1997, the district required all students to begin high school taking a college-preparatory curriculum. This includes four credits of college-preparatory English; three credits of math that include algebra, geometry, and algebra II, or higher-level courses in the math sequence; and three credits of laboratory science. Remedial courses were discontinued. A dramatic change in coursework accompanied the change in graduation requirements in 1997, when the district began requiring all students to take a college-preparatory curriculum. A prior study showed that 90 percent of the students in this cohort took a full college-preparatory curriculum, compared to just over 60 percent in prior years.³⁵ However, this policy did not lead all students to take more rigorous classes. The percentage of students who took advanced math (e.g., statistics, pre-calculus, solid geometry) and advanced science courses initially dropped when the new graduation requirements were instituted. However, the decline in advanced math and science course-taking that accompanied the new graduation requirements did not last. As of the class of 2008, a larger

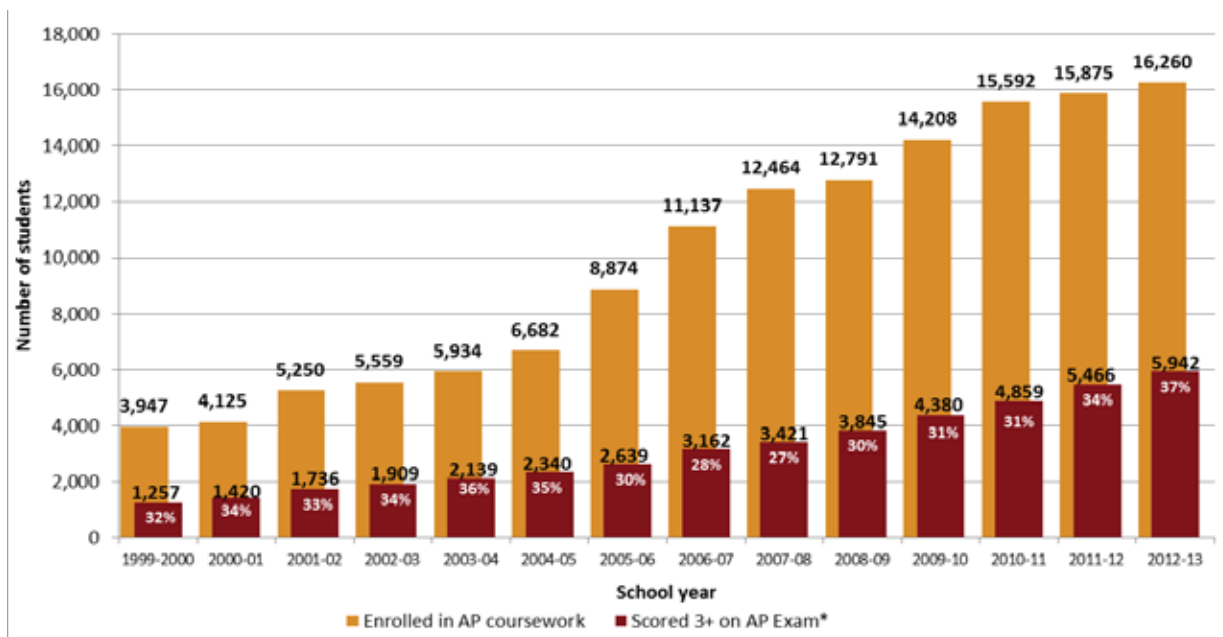
³⁵ Luppescu et al. (2011); Montgomery & Allensworth (2010).

percentage of students were taking advanced math classes than before the 1997 change in graduation requirements. Furthermore, the percentage of students that take calculus has continuously increased through time. The percentage of students taking both chemistry and physics has risen somewhat with more recent cohorts, and there has been a continual increase over time in the percentage of students taking advanced and AP (Advanced Placement) science classes.³⁶

Data posted by CPS (see Figure 14) also show that more students have been enrolling in AP coursework and more have scored 3 or better on the exams, potentially qualifying them for college credit. The number of students enrolled in AP coursework has increased fourfold since 2000. While the largest increases in AP course-taking (in 2006 and 2007) were associated with a decline in the *proportion* of students scoring 3 or better, the *number* of students scoring a 3 or better on an AP exam continued to increase since so many more students were taking AP courses. In subsequent years, the *proportion* scoring 3 or better also steadily increased, even as the number of students taking AP courses also continued to increase.

Figure 14: More Students Are Enrolled in AP Coursework, and the Proportion That Score 3 or Higher on an AP Exam Has Increased in Recent Years

Number of students in grades 9-12 enrolled in AP coursework and scoring 3 or better on the AP exam



Source: AP. (2015, July 24). 2013_citywide_scorecard_by_school_20130807.xlsx. Retrieved from <http://cps.edu/SchoolData/Pages/SchoolData.aspx>

*The white text within the red bar represents the *percent* of students getting a 3 or better among those who took an AP exam; the black text above the red bar represents the *number* of students obtaining a 3 or higher on an AP exam.

³⁶ Details on all of these trends can be found in Lupescu (2011).

Chapter 2: Summary

It does not appear that CPS schools are lowering their standards to get more students to graduate. Instead, it appears that CPS students are attending class more often and learning more than in the past, as well as being more likely to graduate. Thus, improvements have been twofold; more students are graduating, *and* graduates have higher achievement. Still, this does not necessarily mean that CPS high schools are doing a better job educating the students that they received—high schools could be enrolling better-qualified students, or students from more affluent neighborhoods. Chapter 3 looks into these explanations for the improvement of graduation rates.

Chapter 3: Are Graduation and On-Track Rates Improving because of Changes in Students' Backgrounds and Prior Achievement?

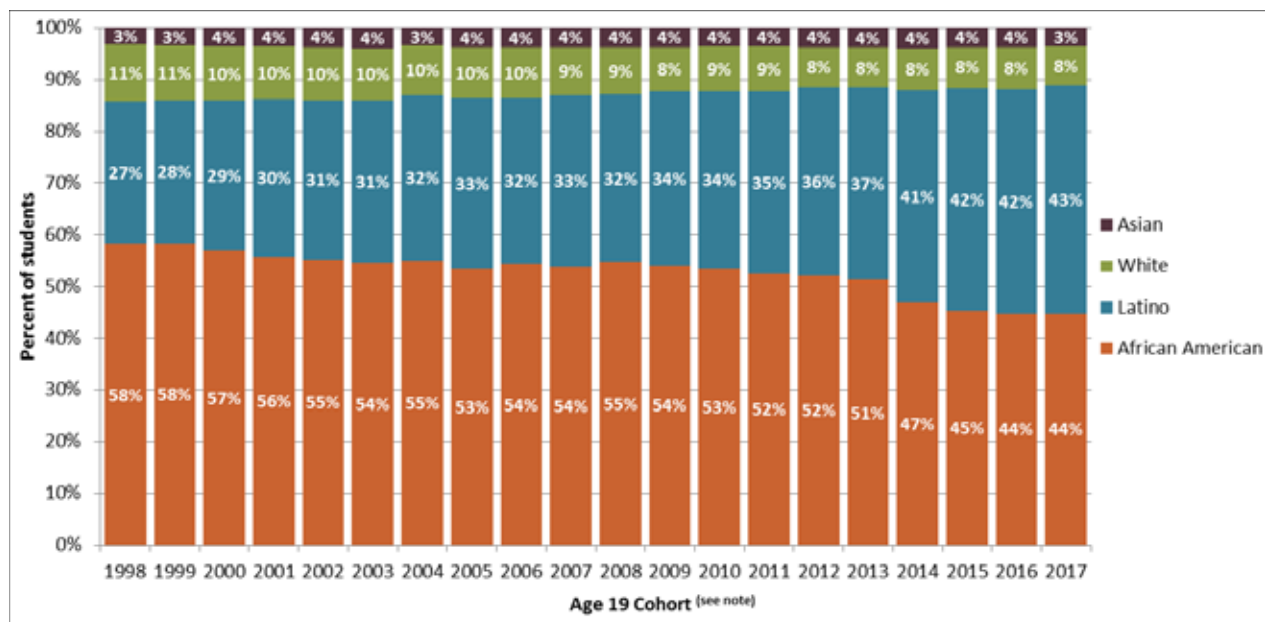
The previous chapters showed that greater proportions of CPS students are graduating high school and doing so with higher achievement levels and more rigorous coursework than graduates in past years. These improvements could have been influenced by changes in the characteristics of students entering CPS high schools, which have changed considerably over the last two decades. Latino students now make up a much larger proportion of students enrolled in CPS than ever before, and fewer students are living in high-poverty neighborhoods. In addition, students are entering high school with higher levels of incoming achievement. The degree to which these changes in background characteristics and incoming achievement could affect graduation and on-track rates depends on two things: 1) how much each of these have changed over time; and 2) how strongly each of these is related to high school graduation and ninth-grade on-track status. This chapter first shows the changes in the background characteristics and incoming achievement of students entering ninth grade over time, and then assesses the degree to which these changes may explain increases in graduation and on-track rates, given how strongly they are related to each outcome and how much they have changed.

The racial composition of incoming ninth-graders and the poverty levels in the neighborhoods where they live have both changed over time

The racial composition of students enrolled in CPS high schools has changed substantially over time. Among ninth-grade students, the proportion of Latino students has increased from 27 percent of the 1998 cohort to 43 percent of the 2017 cohort (see Figure 15). African American students made up 58 percent of the 1998 cohort, but only 44 percent of the most recent cohort. In addition, the proportion of white students has decreased slightly over time, dropping from 11 percent in 1998 to 8 percent in 2017. The percent of Asian students has remained fairly stable, which is 3-4 percent of students.

Figure 15: Racial Composition Has Changed Over Time

Racial composition of cohorts of students who attended a CPS high school for ninth grade



Note: We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Students who permanently transferred out of CPS are not included in this figure, since they are not included in the graduation rate.

The economic context of Chicago’s students has also changed during the last two decades, with fewer CPS students living in neighborhoods with extremely concentrated poverty. Between the 1998 and 2013 cohorts, the percent of students who lived in high-poverty neighborhoods (where about a third or more of the residents were below the poverty) line dropped from 37 to 27 percent (see Figure 16). Since the 2013 cohort, the percent of students living in neighborhoods with very high poverty rates has crept up somewhat, to 32 percent; but remains below the 1998 level.

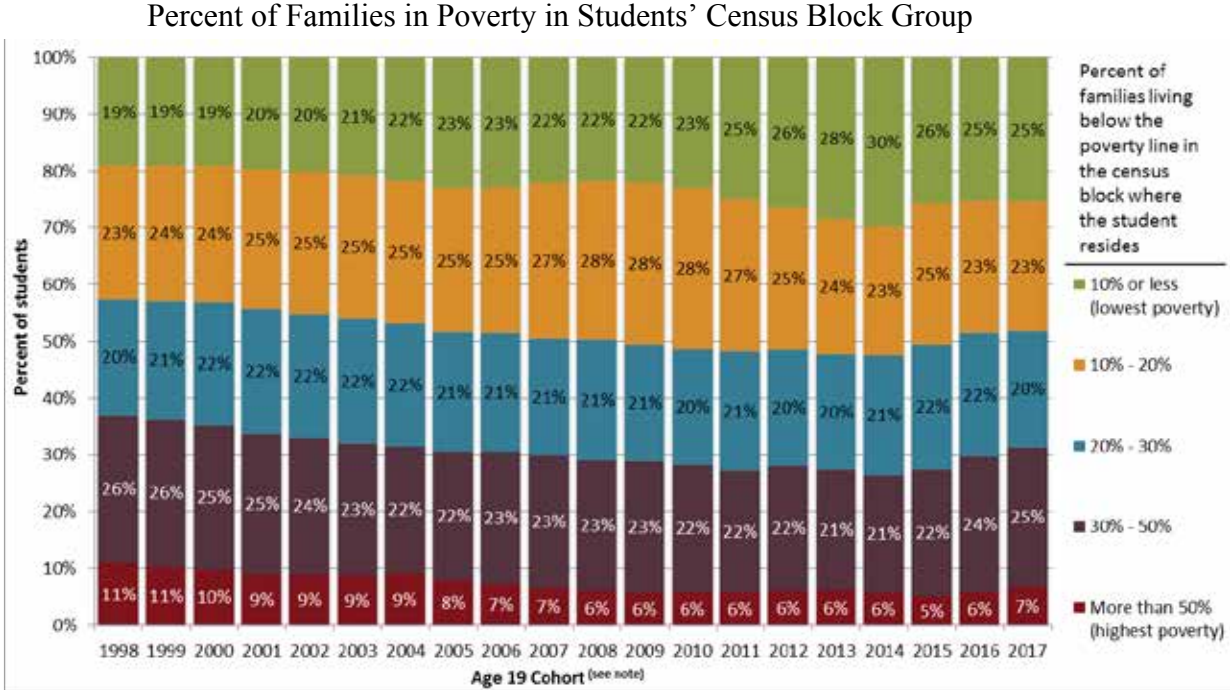
Improvements in the economic status of communities that CPS students live in may be due to a number of different factors, including a decrease in the level of poverty within Chicago neighborhoods, migration of CPS families out of high-poverty neighborhoods, or an increase in the number of families from low-poverty neighborhoods who choose public school over private school. Some of the changes in CPS students’ neighborhood poverty seem to be the result of decreases in poverty across the city. Census data on Chicago confirm that between 1990 and 2000 there was a decrease, from 34 to 29 percent, in the percent of children aged 18 or younger who were living below the poverty line in the city; students in the 1998 to 2005 cohorts of 19 year olds would have been starting high school during this time. Since then, the percentage of children living below the poverty line in the city has risen, and was estimated at 33 percent in 2013 (which is the year the majority of the 2018 cohort would have started high school).³⁷ Other changes in neighborhood poverty are due to fewer neighborhoods having concentrated poverty. From 2000 to 2003, the city of Chicago began tearing down many of its large public housing

³⁷ This is the five-year average (from 2009 to 2013), calculated from the American Community Survey.

projects, which provided housing to the city’s poorest residents. Some residents of these housing projects relocated outside of the city, while others moved to mixed income public housing within the city.³⁸ This resulted in fewer neighborhoods with very high concentrations of poverty.

There have also been changes in the degree to which families in low-poverty neighborhoods enroll their children in CPS high schools. CPS has opened a number of new selective enrollment high schools and opened and expanded International Baccalaureate programs in neighborhood high schools. A prior study showed that the percentage of high-achieving students leaving CPS for other schools and districts between middle school and high school declined during the time when more selective schools opened, while the number of students entering CPS high schools from private elementary schools increased.³⁹ Thus, more affluent families may have chosen to enroll their children in CPS high schools than in the past because of the availability of selective high schools. There were also larger increases in the percentage of students enrolled in CPS high schools from neighborhoods with the lowest poverty rates in the 2013 and 2014 cohorts; students in these cohorts would have entered high school in the years of economic downturn (2008 and 2009). Families may have been more likely to attend free public schools rather than private schools during these years. In 2010, once the recession was over, they may have been more likely to again choose private schools, as the percentage of students enrolling in CPS from these neighborhoods returned to pre-recession levels with the 2015 cohort.

Figure 16: Students Are Coming from Neighborhoods with Less Dense Poverty Levels



Note: Poverty levels are calculated based on a student’s home address in the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Students who permanently transferred out of CPS are not included in this figure, since they are not included in the graduation rate.

³⁸ Goerge, Dilts, Yang, Wasserman, & Clary (2007).

³⁹ Allensworth & Rosenkranz (2000).

Fewer students in the most recent cohorts enter ninth grade older than age 14

There is a great deal of research showing that students who begin ninth grade when they are older than age 14 are less likely to graduate.⁴⁰ For students who are 15 or 16 years old when they enter high school, graduating in four years means staying in school until age 19 or 20—when many of their same-age peers have already left high school. Changes in promotion standards at different time points affect students’ timely progression in school.⁴¹ This is a notable issue in CPS, which has used promotion standards in eighth grade since 1995, and in third and sixth grades since 1996, to restrict students’ movement into the subsequent grade. These promotion standards have changed repeatedly over the last 20 years—alternately getting easier and more stringent—and have been based on students’ performance on standardized tests, and sometimes also by their course grades and attendance. As shown in Figure , there has been substantial variation over time in the percentage of students who were held back in elementary school.

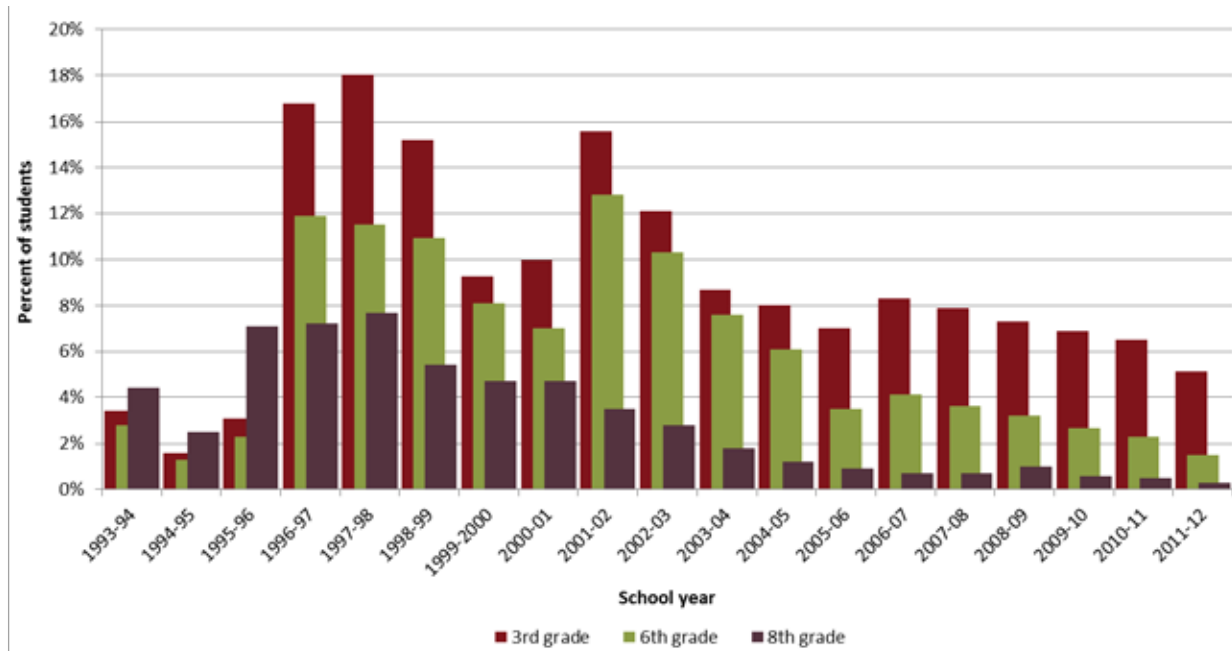
Changes in promotion standards lead to corresponding changes in the proportion of CPS students who begin ninth grade older than age 14. This can be seen in the degree to which students in different cohorts for this study began high school at older ages. The percent of students entering ninth grade at age 15 or older declined among the first three cohorts in the study—these cohorts of students were not subject to promotion standards when they were in elementary school, then began an upward trend starting with the 2002 and 2003 cohorts—the first cohorts subject to the eighth-grade promotion standards in 1996 and 1997 (see Figure 18). In subsequent years the district made the promotion standards stricter at various points in time, and more students began high school at age 15 or older. There was also fluctuation as cohorts of students who were held back in earlier grades with promotion standards (third and sixth grades) became old enough to enter high school. Among more recent cohorts, fewer and fewer students have been entering high school at age 15 or older.

⁴⁰ Alexander, Entwisle, & Kabbani (2001); Allensworth (2005); Roderick (1994).

⁴¹ Allensworth & Nagaoka (2010); Roderick, Bryk, Jacob, Easton, & Allensworth (1999).

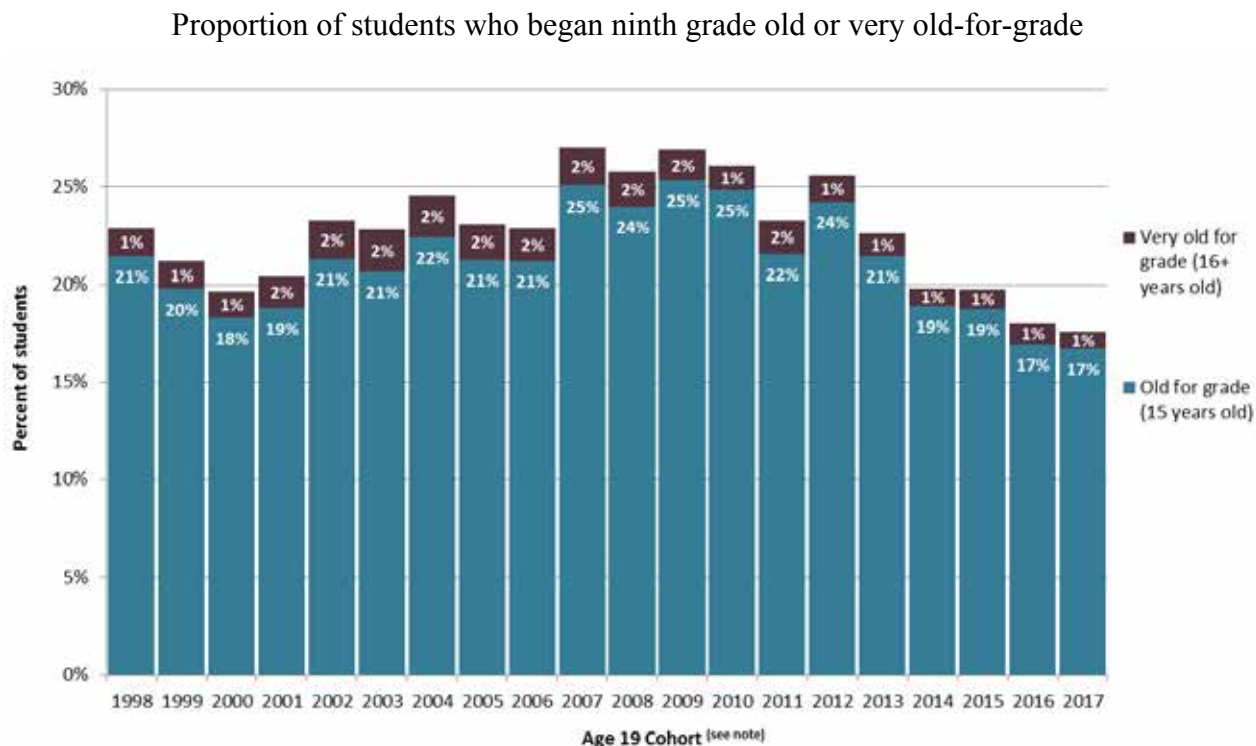
Figure 17: The Proportion of Students Held Back in Elementary School Have Fluctuated as Promotion Standards in Grades 3, 6, and 8 Have Changed over Time

Retention rates in grades 3, 6, and 8 over time



Source: Chicago Public Schools. (2014, April 21). CitywideElementaryPromotion.pdf. Retrieved from <http://cps.edu/SchoolData/Pages/SchoolData.aspx>

Figure 18: The Proportion of Students Who Begin Ninth Grade Older than Age 14 Has Varied over Time



Note: Age is as of September 1 in the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Students who permanently transferred out of CPS are not included in this figure, since they are not included in the graduation rate.

While there have been changes in the demographic background characteristics of students entering CPS high schools, these changes do not account for the improvements in graduation rates

The degree to which changes in the demographic backgrounds of students may have led to a change in graduation rates depends on how much these factors have changed over time, and the strength of their relationship with graduation rates. Background characteristics (e.g., race, gender, and neighborhood poverty) have modest relationships with graduation, ranging from about 0.1 to 0.2 (see Figure A.1 in Appendix A for correlations over time). This may seem surprising given the differences in graduation rates we see among students of different race and ethnicity, gender, and neighborhood poverty levels. There are much larger differences in the achievement levels of students within any racial/ethnic group or type of neighborhood than there are differences in average achievement between them, with considerable overlap across groups.

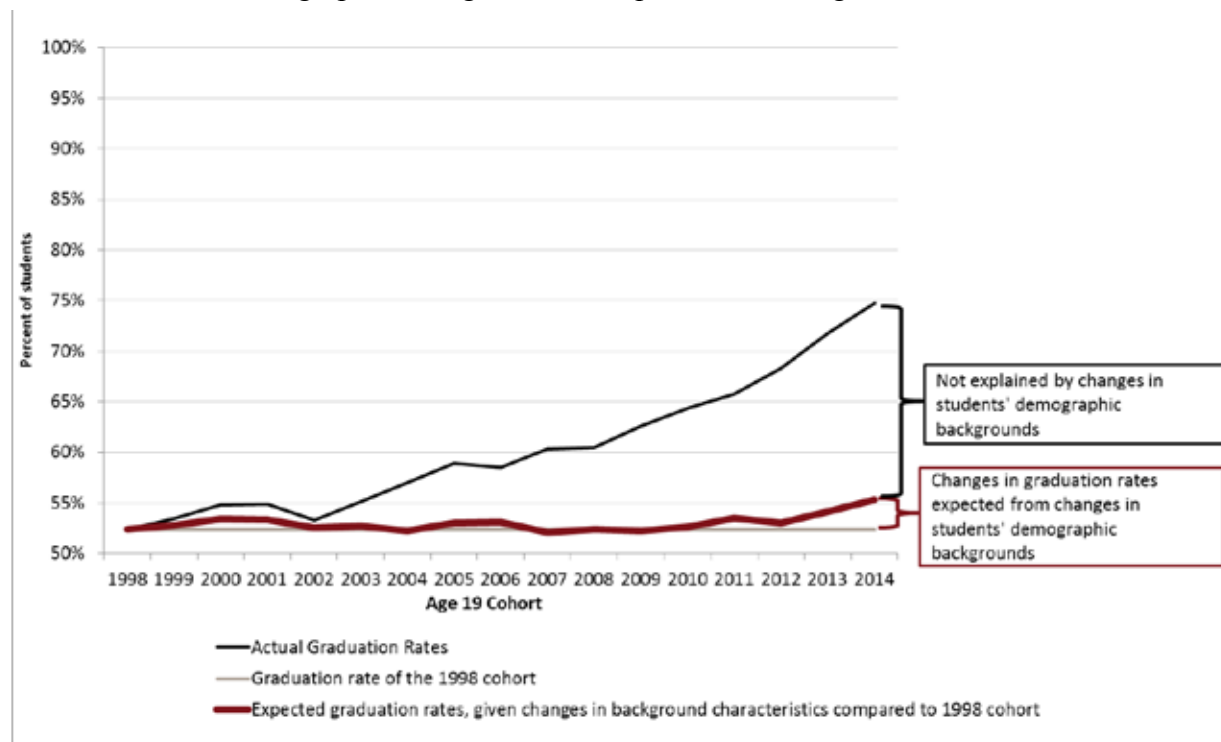
In addition, the demographic trends that have occurred have countervailing relationships with graduation rates. Students' age at starting high school has the largest relationship of any demographic factor with graduation rates, and the increases in the percentage of students entering high school at older ages should have had a negative influence on graduation rates in

many years. Yet, this negative influence was countered-balanced by a decrease in students coming from high-poverty neighborhoods, which is associated with higher graduation rates. Racial/ethnic changes in student body composition were considerable. However, the largest change was the increase in Latino students, who tend to graduate at rates that are between those of white and African American students.

Thus, demographic changes account for very little of the change in graduation rates over time. To assess how changes in students' backgrounds and incoming achievement are related to improvements in graduation rates over time, we estimated the changes in graduation rates that would be expected given the changes that occurred in students' background characteristics, compared to the baseline cohort (students who turned 19 in 1998). The models are described in Appendix A, which also provides a table that shows the potential influence of each of the demographic factors by itself. As shown in Figure 19, almost none of the changes in graduation rates can be attributed to differences in the high school student body composition, based on students' race and ethnicity, gender, age, or neighborhood poverty. Only in the most recent two years (cohorts that turned 19 in 2013 and 2014), when there was a decrease in the percentage of students starting high school old for grade, and in the degree of poverty in students' neighborhoods, could we attribute any improvements in graduation rates to changes in these background characteristics.

Figure 19: Changes in Students' Demographic Characteristics Explain Little of the Improvements in Graduation Rates

Graduation rates expected from differences in students' demographic backgrounds, compared to actual graduation rates



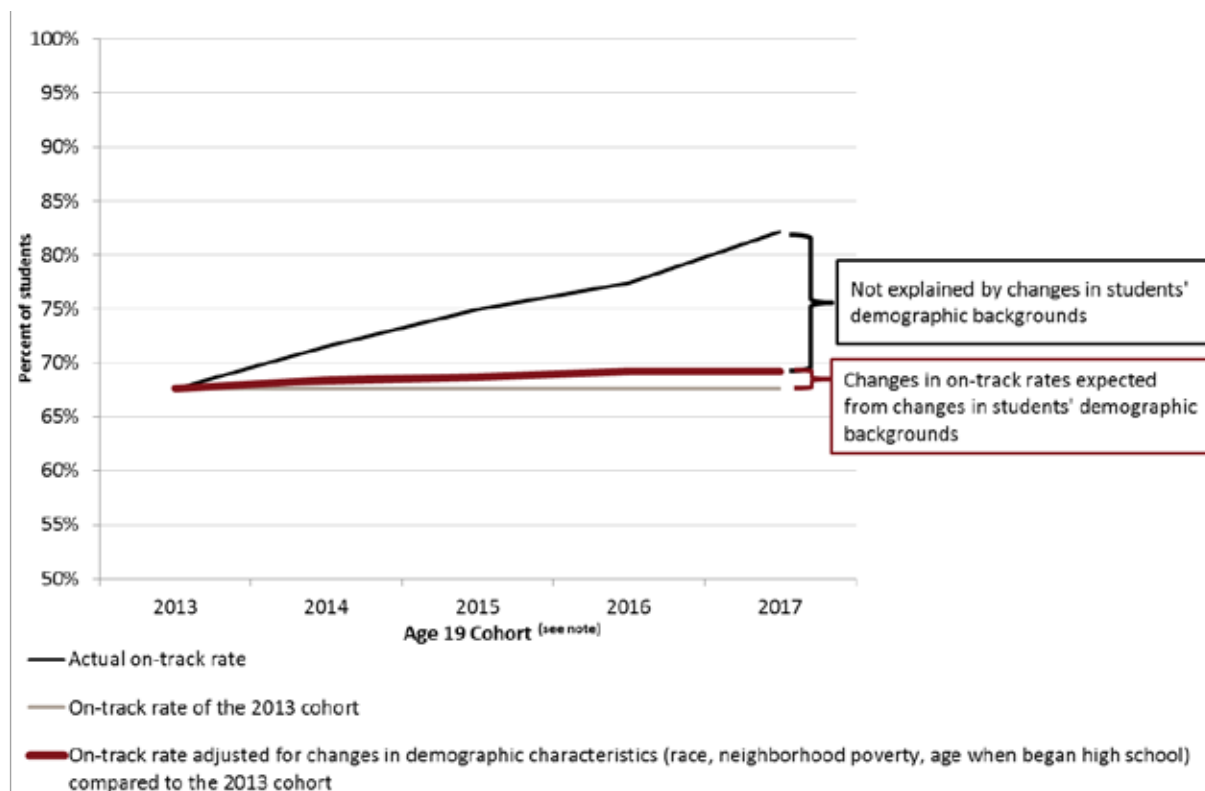
Recent increases in on-track rates also are not explained by changes in the backgrounds of students entering ninth grade

Students' demographic characteristics (e.g., race and ethnicity, gender, neighborhood poverty, and whether they are older than age 14 when they begin ninth grade) each have a modest relationship with their on-track status, with no correlation exceeding 0.2.. Because their relationships with on-track status are fairly small, none of the demographic changes that have occurred in the last four ninth-grade cohorts would be expected to produce a substantial increase in freshman on-track rates (see Table A.2 in Appendix A). The decline in students' age when beginning high school shows the largest potential impact, and would be expected to lead to an increase in on-track rates from 67.6 percent with the cohort of students who turned 19 in 2013 to 68.8 percent for those that turn 19 in 2017—far short of the actual increase to 82.1 percent. Combined, changes in these characteristics would be expected to produce an increase in on-track rates of just 2 percentage points. Thus, they account for very little of the increase in the freshman on-track rate (see Figure 20).

Unlike the analyses of graduation rates, these analyses do not include students who attend charter schools in ninth grade. Charter schools were not required to provide data on their students' course performance to CPS, and so we are unable to determine their students' on-track status. Instead, an analysis of changes in promotion rates to tenth grade in charter schools is provided in the inset box, "Charter Schools and Ninth- to Tenth-Grade Promotion Rates."

Figure 20: Changes in Students' Demographic Background Characteristics Do Not Explain the Improvements in On-Track Rates

On-track rates expected from differences in students' demographic backgrounds, compared to actual on-track rates



Note: On-track status is determined in the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. See Appendix A for the models used to produce the data shown in this figure

Students' entering test scores improved before 2003, then declined, and then rose again

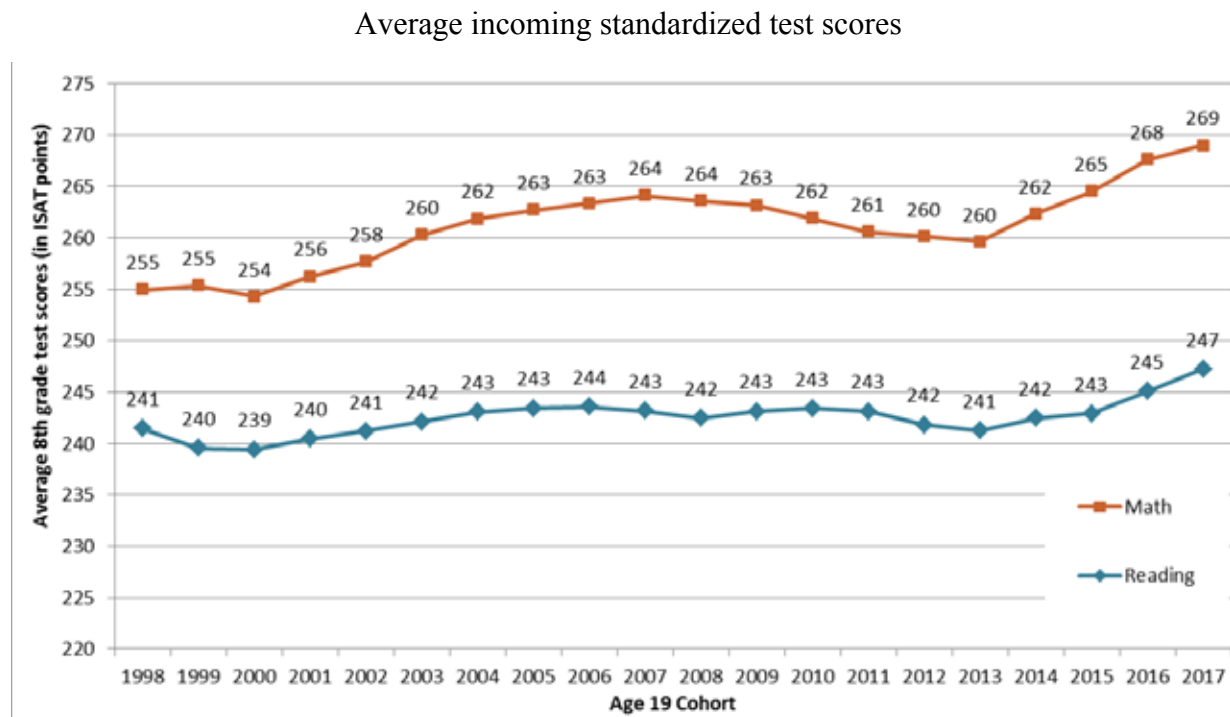
There have been a number of initiatives to improve students' reading and math skills in the primary and middle grades over the last 20 years. A prior study showed that average math scores in the elementary grades increased at a number of points of time—from 1990 to 1993, again from 1996 to 2000, and again from 2007 to 2009, which was the last year of that study (Luppescu et al., 2011). In addition, the district's changes in test-based promotion standards led students with low test scores to repeat grades 3, 6, and 8, sometimes for multiple years in a row.⁴² Consequently, these students received additional years of instruction before entering high school. Some students with low test scores never entered ninth grade, as they left the district or dropped out of school after failing to pass the promotional standard to get into high school.⁴³ As a result, ninth-grade cohorts had higher levels of incoming achievement.

⁴² Allensworth & Nagaoka (2010); Roderick et al. (1999).

⁴³ Allensworth (2004).

Changes in ninth-graders’ entering achievement levels are shown in Figure 21. Prior math test scores improved each year with the 2001 to 2007 19-year-old cohorts, after which point they declined somewhat for a number of years. Recent cohorts, from 2014 on, have shown considerably stronger entering math test scores. Reading test scores improved modestly between the 2000 and 2004 cohorts, before stagnating for several years. Recent improvements, from the 2013 cohort on, have been more substantial, and the last two cohorts have had higher entering reading and math scores than any prior years.

Figure 21: Average Incoming Math Test Scores Improved before 2008, Then Declined, Then Rose again Beginning in 2014

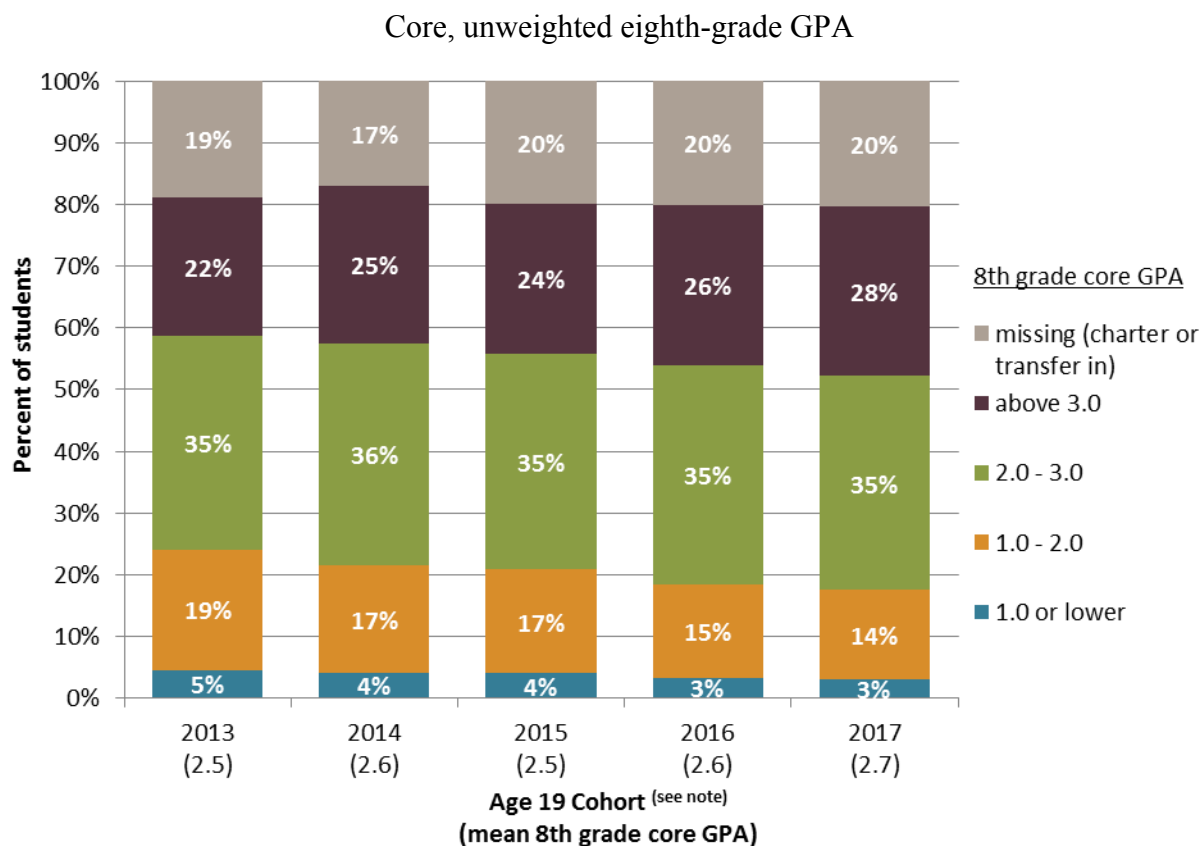


Note: Incoming test scores are determined in the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Test scores are calculated using all available scores for each student from third through eighth grade. These scores can be thought of as capturing students’ underlying achievement level as of eighth grade (Miller, Allensworth, & Kochanek, 2002; Miller & Allensworth, 2002). The standard deviation of math test scores for the 1998 cohort was 18.3 points which means that the 14 point increase in math scores from the 1998 to the 2017 cohort is more than three-quarters of a standard deviation. The standard deviation of reading test scores for the 1998 cohort was 13.0 points, which means the 6 point increase in reading scores from the 1998 to the 2017 cohort is nearly half a standard deviation. Students who permanently transferred out of CPS are not included in this figure, since they are not included in the graduation rate calculation.

In recent years, students are beginning high school with slightly better eighth-grade school performance (GPAs and attendance)

Students’ GPAs and attendance in eighth grade are more predictive than their test scores of whether they will be on-track at the end of ninth grade, and whether they ultimately graduate.⁴⁴ If students are earning higher grades and attending school more frequently in elementary school, high school on-track rates should have increased, even if high schools did not change their practices. Students’ grades in elementary school are only available since 2007, so the first cohort of high school students we can examine turned 19 years old in 2013 (see Figure 22). Subsequent to that cohort, a greater proportion of students have been entering ninth grade after having earned a 3.0 or better GPA (mostly As and Bs) in eighth grade, and a smaller portion are entering ninth grade after earning between a 1.0 and 2.0 GPA (mostly Cs and Ds) in eighth grade. From the 2013 to the 2017 cohort, the average eighth-grade GPA of incoming ninth-graders increased from 2.5 to 2.7.

Figure 22: Students Are Entering High School with Slightly Stronger Eighth-Grade GPAs

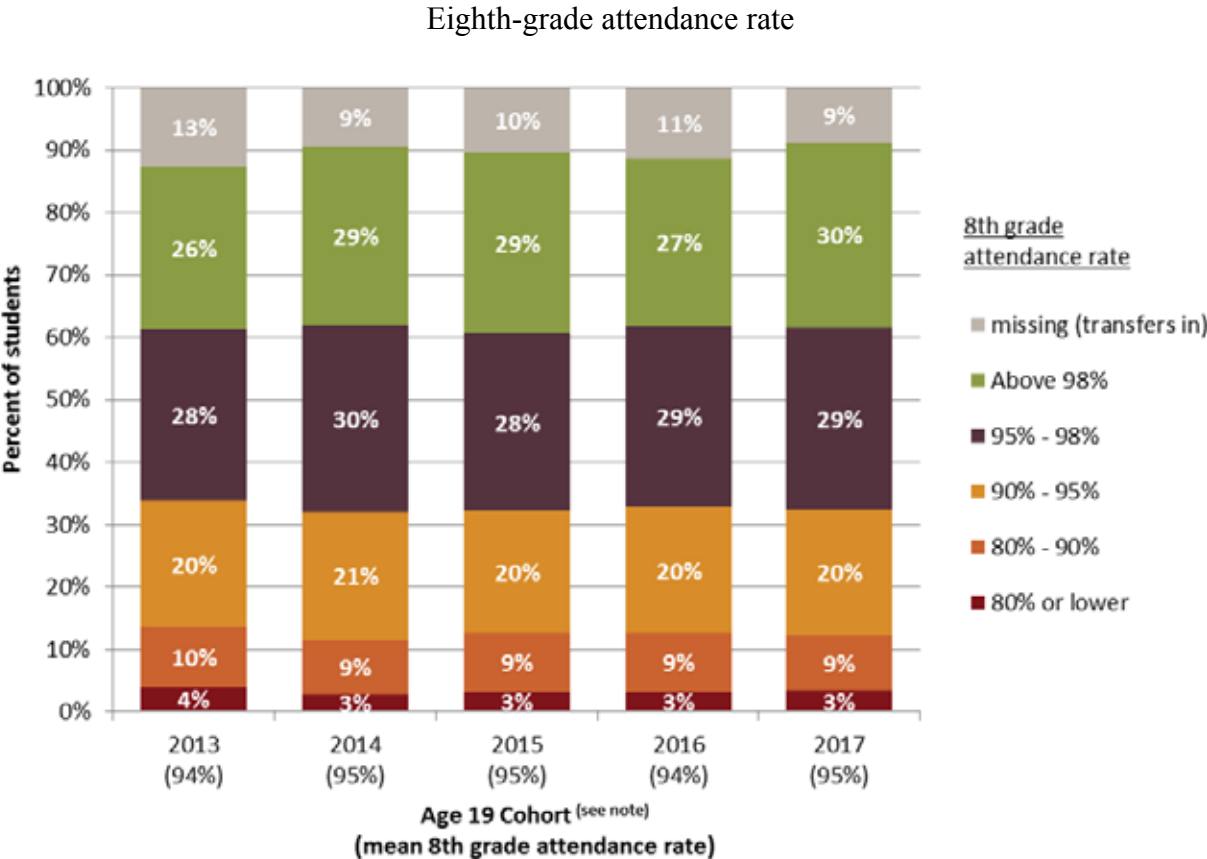


Note: Eighth-grade GPAs are based on the year before the student first entered ninth grade. For most students, this is when they are 13-years-old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Elementary school grades are not available for cohorts prior to 2013. Students who permanently transferred out of CPS are not included in this figure, since they are not included in the graduation rate. We do not have course grades for students who attended charter schools or schools outside of CPS for eighth grade.

⁴⁴ Allensworth, Gwynne, Moore, & de la Torre (2014); Neild & Balfanz (2006); Keiffer & Marinell (2012); Baltimore Education Research Consortium (2011).

The proportion of students entering ninth grade with strong attendance in eighth grade increased slightly from the 2013 to the 2017 cohort (see Figure 23). As with students’ grades, we can only compare elementary grade attendance rates back to 2007 (when most of the 2013 cohort was in eighth grade). Students who had 98 percent attendance or better (missing fewer than four days of school) in eighth grade accounted for 26 percent of the 2013 cohort and 30 percent of the 2017 cohort. During the same time period, the proportion of students who were chronically absent in eighth grade—with attendance rates below 90 percent which translates to 18 or more days of school missed—decreased slightly, from 14 percent to 12 percent.

Figure 23: Students Are Beginning High School with Very Slightly Better Eighth-Grade Attendance Compared to Prior Ninth-Grade Cohorts



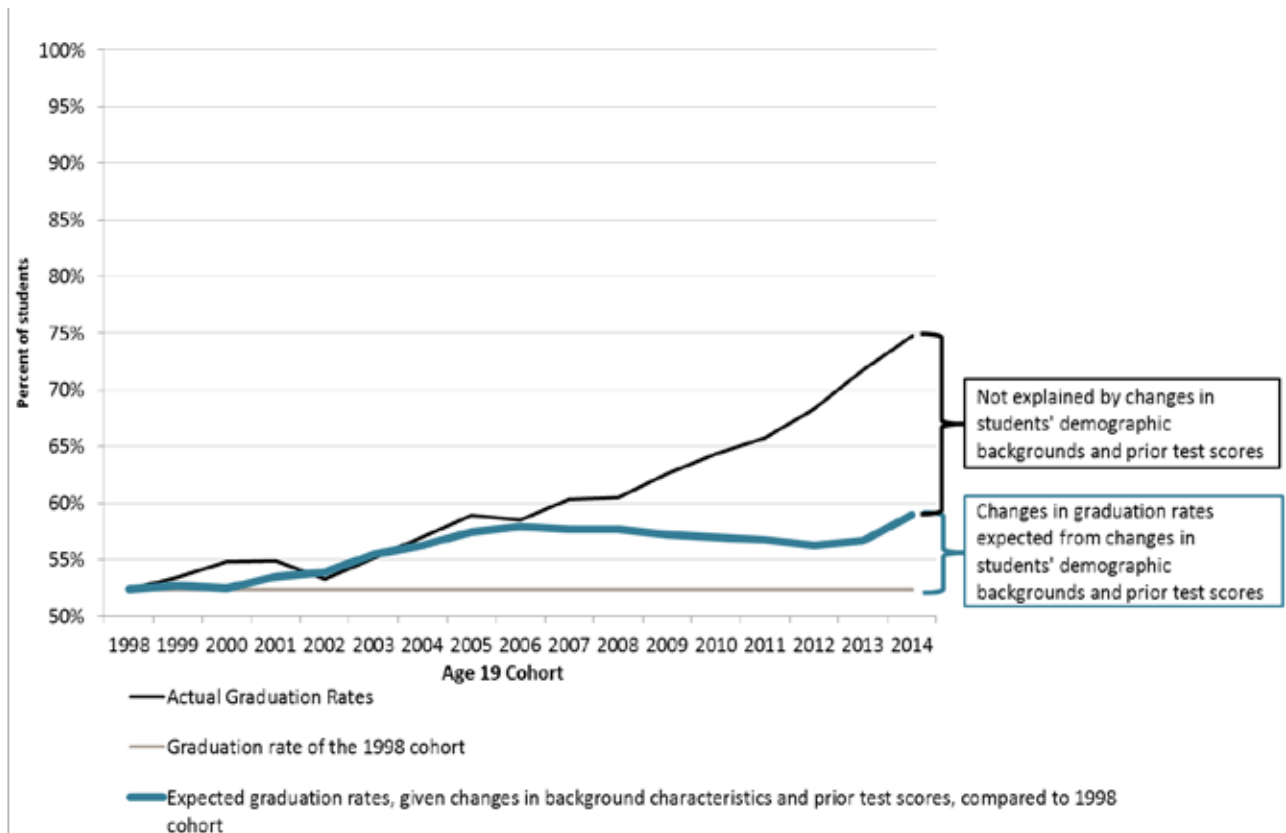
Note: Eighth-grade attendance rates are based on the year before the student first entered ninth grade. For most students, this is when they are 13 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Elementary school attendance is not available for cohorts who were in the elementary/middle grades prior to 2008. Students who permanently transferred out of CPS are not included in this figure, since they are not included in the graduation rate.

Improvements in students' prior achievement can explain all of the improvements in graduation rates through 2006, but not in subsequent years

Students' prior test scores have somewhat stronger relationships with graduating than their demographic backgrounds, with correlations of about 0.3 on a scale from zero to 1 (see Appendix A). As shown in Figure 9, the improvements observed in graduation rates are almost exactly what would have been expected due to changes in students' incoming test scores among cohorts of students who turned 19 between 2000 and 2006. Among cohorts who turned 19 in 2007 and beyond, entering math scores declined while graduation rates continued to increase. Thus, incoming achievement, as measured by test scores, does not explain improvements in graduation rates after 2007. Unfortunately, middle grade GPAs and attendance were not available to study for cohorts that entered high school prior to 2007, and could not be used as measures of prior achievement when studying graduation rates.

Figure 24: Rising Levels of Students' Incoming Achievement Should Have Led to Improvements in Graduation Rates through 2006

Graduation rates expected from differences in students' prior test scores and backgrounds, compared to actual graduation rates

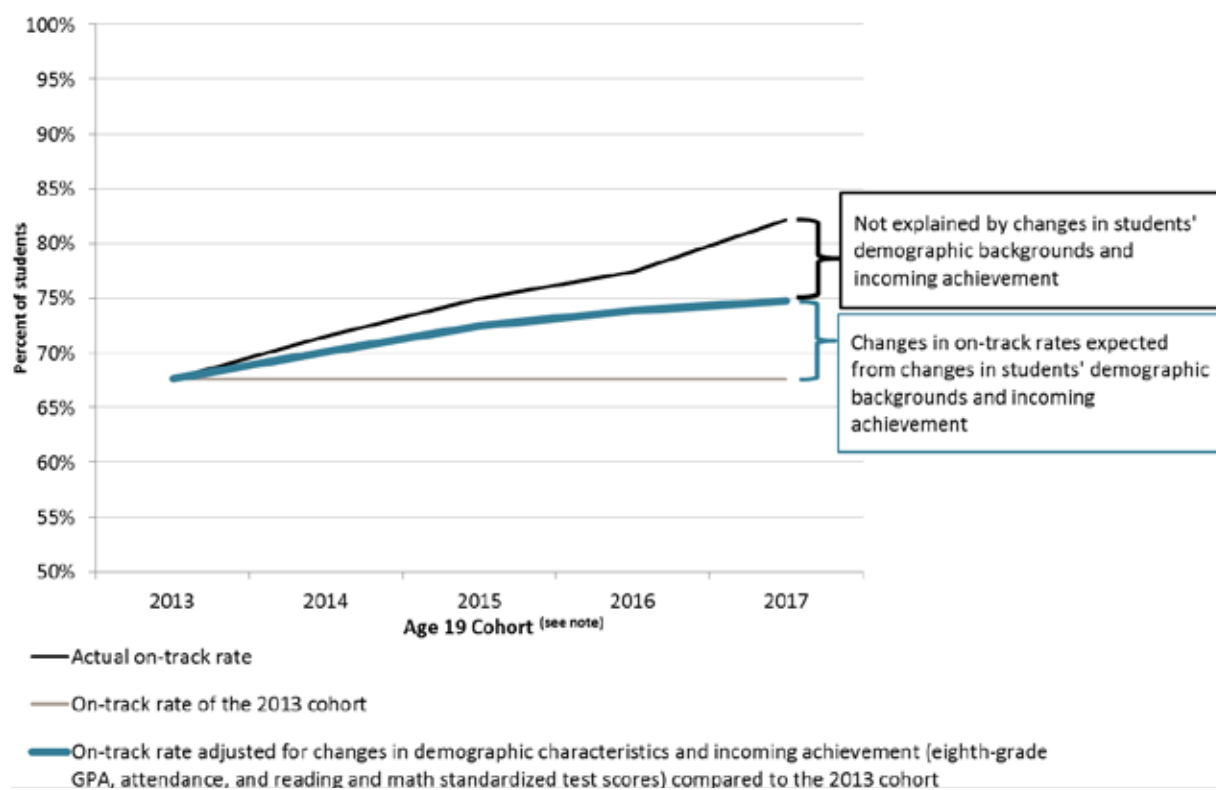


About half of the increase in the freshman on-track rate in recent years can be attributed to improvements in students' incoming achievement

As with high school graduation, students' prior achievement, particularly their incoming math scores, are more strongly related to on-track status than their demographic characteristics. Furthermore, when studying the rise in on-track rates, data are available to examine measures of prior achievement other than just test scores; grades and attendance in middle school are also available. Figure 10 shows that changes in prior achievement, including eighth-grade GPA and attendance and incoming math and reading test scores, combined with changes in demographic backgrounds, account for over half of the increases in on-track rates among the 2013 to 2016 cohorts, and just under half of the increase in on-track rates by the 2017 cohort.

Figure 25: Changes in Students' Incoming Achievement Account for about Half of the Improvements in the Freshman On-Track Rate

On-track rates expected from changes in students' prior achievement and demographic backgrounds, compared to actual on-track rates



Note: On-track status is determined in the year the student first entered ninth grade. For most students, this is when they are 14-years-old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. See Appendix A for the models used to produce the data shown in this figure.

Charter Schools and Ninth- to Tenth-Grade Promotion Rates

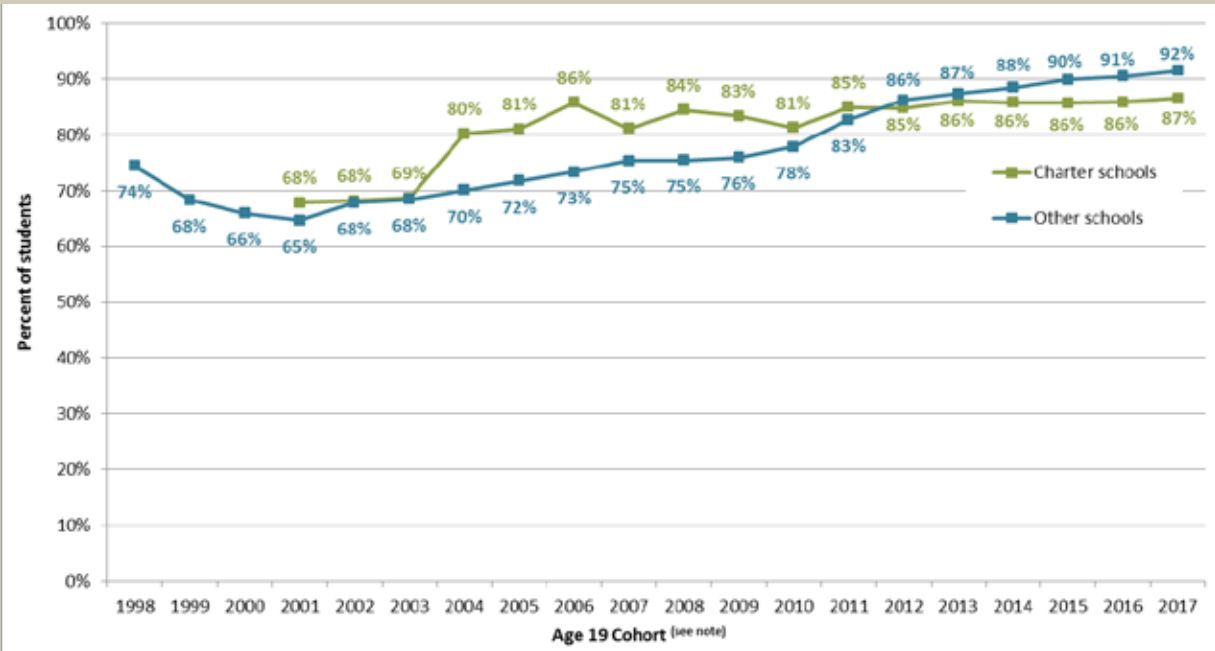
Until recently, students who attended charter high schools were not included in the district's on-track calculation because charter schools were not required to provide data on their students' course performance to CPS. As a greater proportion of ninth-graders attend charter schools, the on-track rate represents a smaller proportion of all ninth-graders.

To examine how the exclusion of charter school students affects the on-track rate, we created a promotion indicator of whether or not the student was promoted to the tenth grade in the fall following ninth grade. This indicator is available for students at charter schools, as well as students at non-charter schools. As with freshman on-track, this indicator shows a strong relationship with high school graduation: 70 percent of ninth-graders in 2008-10 who were promoted to tenth grade graduated high school in four years compared to 30 percent of ninth-graders who were retained in ninth grade.

Figure B shows how the promotion rate in charter high schools compares to the promotion rate in other CPS high schools. These rates do not include students who transferred out of CPS during their ninth-grade year. The top line shows that when the first charter high schools opened in Chicago, the promotion rate among charter school ninth-graders was very similar to the promotion rate for students in other CPS high schools. The promotion rate improved dramatically with the opening of new charter schools in the early 2000's. The charter school promotion rate has remained fairly similar since that time. The bottom line in the figure shows that the promotion rate among ninth-graders in other CPS high schools has been increasing since its low with the 2002 cohort, catching up and surpassing the charter school promotion rate beginning with the 2012 cohort. For the most recent cohorts, promotion rates for charter school students have hovered around 86 percent while promotion rates for students at other CPS schools have continued to increase and now exceed 90 percent.

Figure B: Promotion rates at non-charter schools have increased to be similar to those at charter schools

Ninth-grade promotion rates by type of school attended



Note: Ninth-grade promotion status is determined at the end of the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same as in those figures.

Chapter 3: Summary

There have been changes in the demographic composition of CPS high school students since 1993. The proportion of Latino students has increased, as the proportions of African American and white students have decreased. Students are less likely to come from neighborhoods with highly concentrated poverty than in earlier years. Despite these differences, changes in students' background characteristics account for very little of the increases in either graduation rates or on-track rates.

Prior standardized test scores among incoming ninth-graders have fluctuated over time, rising for many years, then declining, and improving among the most recent cohorts of ninth-graders. Similarly, eighth-grade attendance rates and GPAs for students in the most recent cohorts have improved slightly. Improvements in test scores account for all of the increase in graduation rates for students who turned 19 before 2006. For students who turned 19 between 2008 and 2013, test scores decreased and account for little to none of the increase in graduation rates that occurred during these years. For more recent cohorts, those who turn 19 between 2013 and 2017, incoming test scores have been on the rise again. These most recent cohorts have not yet been in school long enough to have graduation rates, but improvements in incoming test scores and eighth-grade GPAs and attendance account for about half of the increase in freshman on-track rates in the most recent cohorts of students.

Chapter 4: Are Graduation and On-Track Rates Improving because of Changes in CPS High Schools?

The previous chapter showed that changes in students' background characteristics and prior achievement only account for a small portion of the increase in high school graduation rates for recent cohorts of graduates and just under half of the recent increases in the freshman on-track rates. If the characteristics of incoming students do not explain the improvements in graduation rates, it suggests that high schools might have been doing a better job over time getting students to graduate. CPS opened a number of new schools during this period, and these new schools could have had more success graduating students. Traditional high schools also could have improved over time, particularly since they started getting early warning indicator reports from the district in 2008-09. In addition, many nonprofit organizations initiated or expanded their work with Chicago high schools to support student achievement in high school. We can't separate out all of the potential sources of improvement in Chicago high schools. However, we can examine the degree to which changes in the types of schools students attended, as well as changes in students' course performance, help to explain the improvements in graduation rates. We focus on the ninth-grade year when examining changes in students' course performance, since only students who stay in school can enroll in courses in later years. We examine whether students were more likely to attend and pass their ninth-grade classes in more recent years, compared to students with similar incoming skills and backgrounds who attended the same high schools in prior cohorts. We then examine whether differences in ninth-grade course performance could explain the improvements in graduation rates, and whether differences in attendance rates explain the improvements in on-track rates in recent cohorts of students.

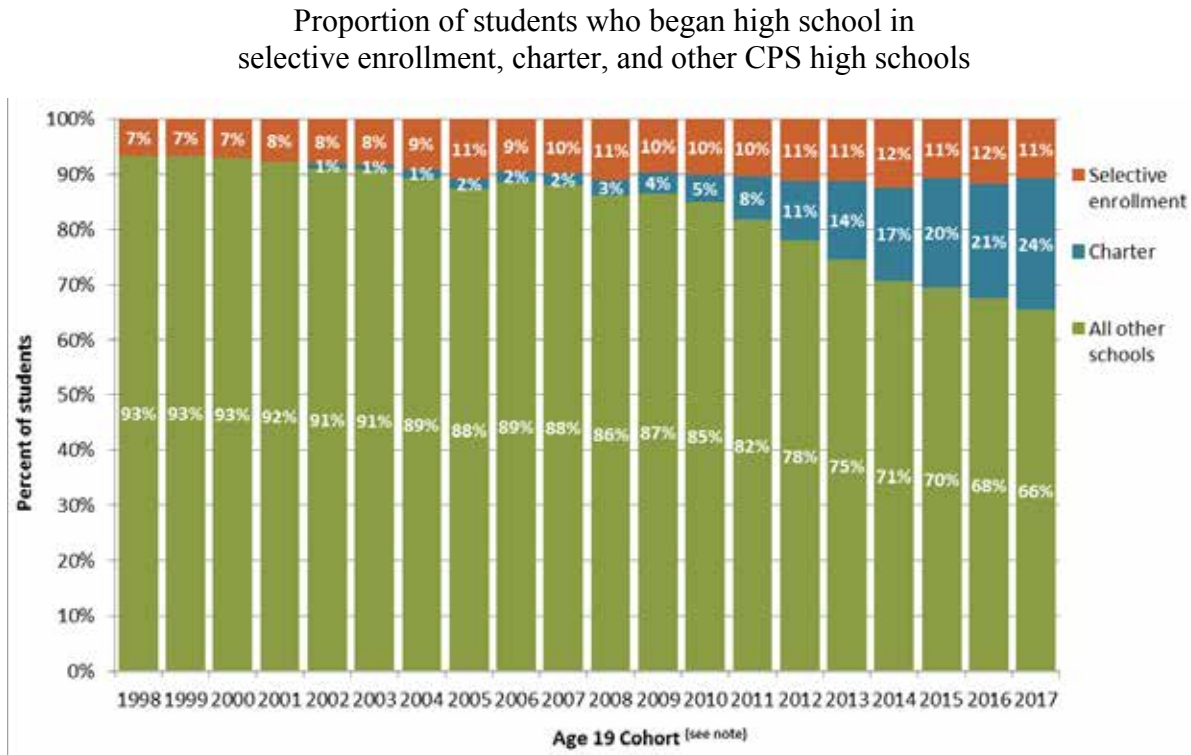
The district opened many new schools and closed or turned around underperforming high schools over the last 20 years

Many new high schools have opened in CPS over the last 20 years, including new selective enrollment high schools, charter high schools, and high schools with specialized focus areas. In fact, the number of high schools more than doubled, from 66 in 1993 to 138 in 2012.⁴⁵ The proportion of students attending a selective enrollment high school in ninth grade increased

⁴⁵ These numbers include specialized schools for students with disabilities, but not alternative schools for dropouts or schools for students who did not pass the eighth-grade promotion standards (transition centers and APCs).

from 7 percent in the 1998 cohort to 11 percent in the 2017 cohort (see Figure 26). Charter high schools did not exist in CPS until the early 1990s. Before the 2010 cohort, just 5 percent or fewer students per cohort attended a charter school for ninth grade. After the 2010 cohort, the proportion of students attending charter high schools increased each year; nearly a quarter of the 2017 cohort attended a charter school for ninth grade.

Figure 26: A Greater Proportion of Students Enroll in Charter and Selective Enrollment High Schools



Note: School type is based on the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Students who permanently transferred out of CPS during high school are not included in this figure, since they are not included in the graduation rate calculations.

Despite substantial changes in recent years in the kinds of schools students attend, with many more students enrolled in charter and selective enrollment schools than before, these changes do not account for much more of the increase in graduation rates beyond demographics and

incoming achievement (see Figure 27).⁴⁶ New schools only explain a small proportion of the increase in graduation rates since 2006, and none of the improvements prior to 2006. This does not mean that the new schools did not matter for district graduation rates. The new schools could have attracted higher-performing students to enroll in public high schools than would have occurred if those schools did not exist; there is evidence that more students entered CPS high schools from private elementary schools during the period when many new selective enrollment schools opened.⁴⁷ However, changes in the types schools students attended did not account for improvements in graduation rates above and beyond what would be expected with the changes in the background characteristics of students. In the most recent years, the expansion of enrollment into new schools could account for just under 2 percentage points of the increase in graduation rates.

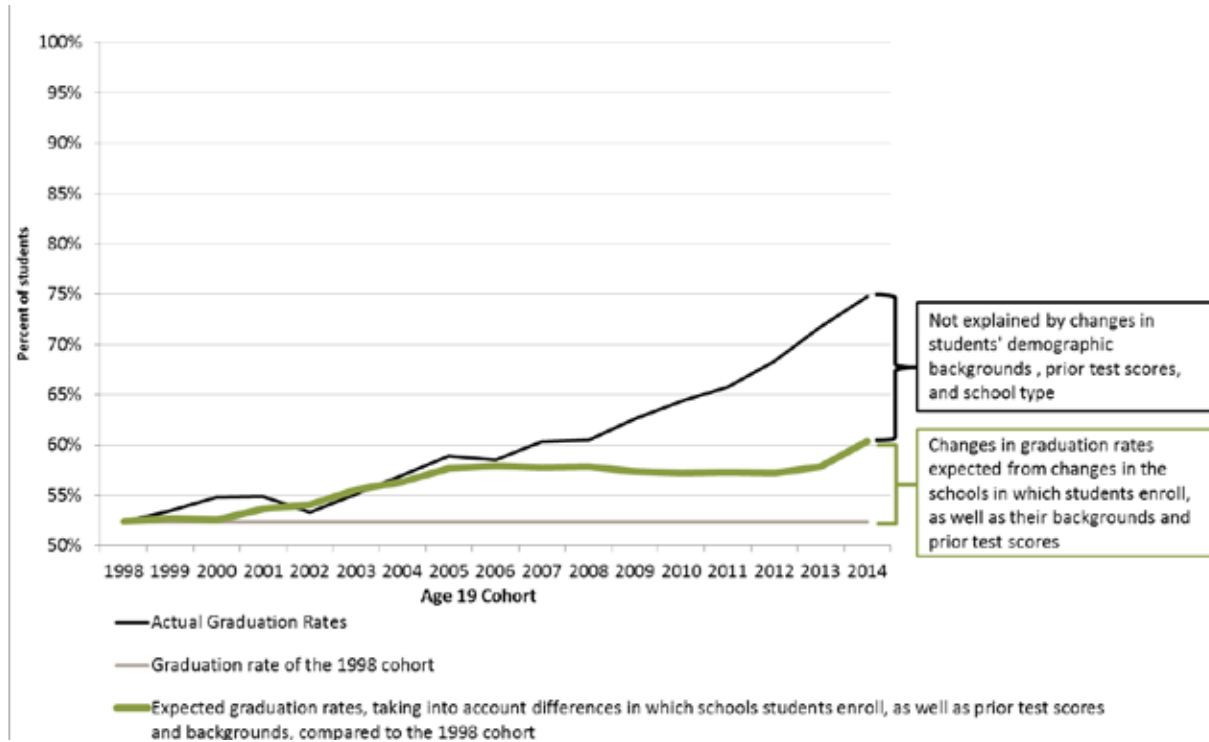
Charter schools do not provide information on course grades and credits to the district, so we cannot examine whether changes in the schools in which students enroll account for improvements in on-track rates in recent years. Exclusive of charter schools, changes in the types of school attended by students in ninth grade do not explain any of the increase in freshman on-track rates beyond what is explained by changes in students' demographic backgrounds and prior achievement.

⁴⁶ The potential influence of school differences is similar regardless of whether they are estimated by controlling for the types of schools students attend (charter, selective enrollment, other), or if the models include school fixed effects which control for the average graduation rates of particular schools and simply adjust for shifts in which schools students attend.

⁴⁷ Allensworth & Rosenkranz (2000).

Figure 27: Changes in the Kinds of Schools Students Attend Do Not Account for Much More of the Increase in Graduation Rates beyond Demographic Characteristics and Incoming Achievement

Graduation rates expected from differences in the proportions of students enrolling in charter and selective enrollment high schools, and students' prior test scores and backgrounds, compared to actual graduation rates



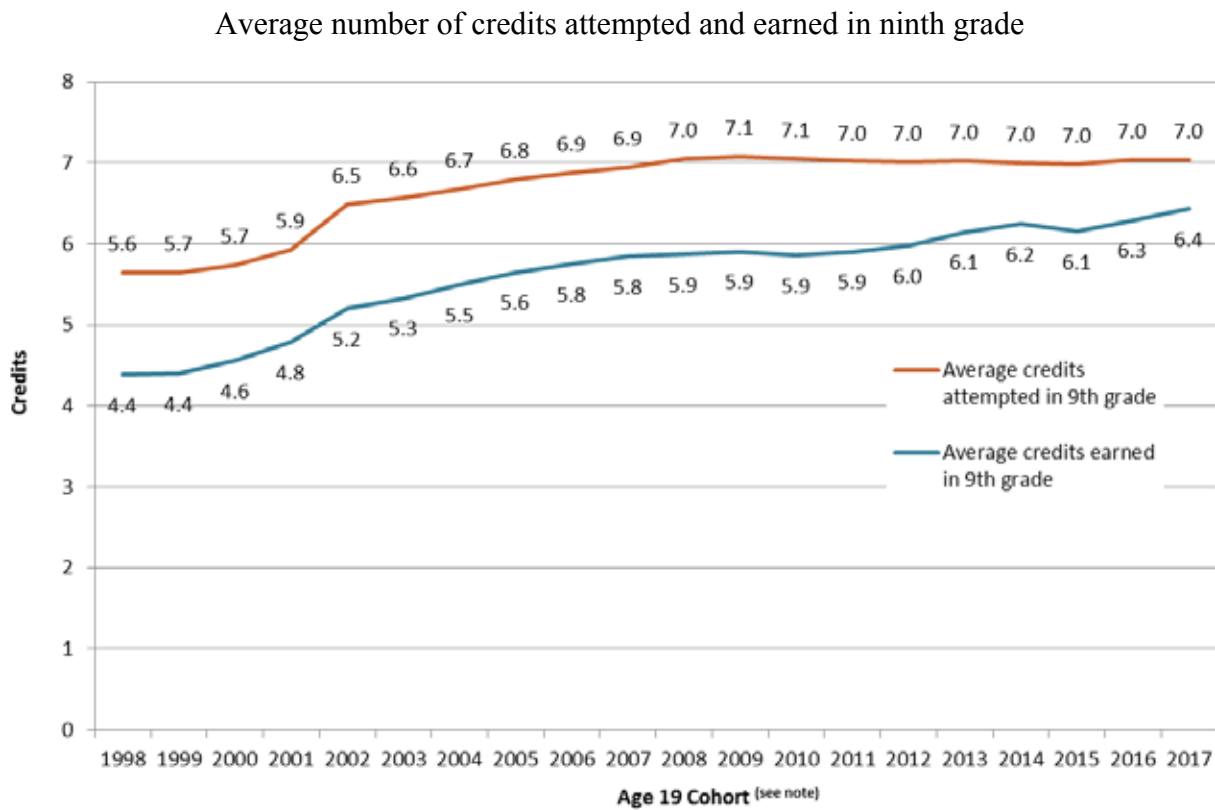
Students are attempting and earning more credits in ninth grade

In the early 1990s, most students attempted only five or six course credits in their first year of high school, so the cohorts that turned 19 prior to 2002 earned less than five credits a year, on average, in their first year of high school (see Figure 28). Because students needed 20 credits to graduate in those cohorts (five credits per year), many students attempted to earn just barely enough credits so that they could graduate if they passed all of their courses. On average, students failed almost a quarter of their courses in their ninth-grade year during those years (see Figure 28), resulting in about half of students being off-track to graduate four years later.

In 1997, the district changed the high school course of study to a college-preparatory curriculum for all students. It also increased the number of credits needed to graduate to 24. This change led the graduation requirements in CPS to exceed those required by the Illinois State Board of Education. The district also encouraged schools to enroll all students in at least six classes during ninth grade, which would allow them to reach the required 24 credits needed for graduation in four years if they passed all of their classes. The average course load of ninth-grade students

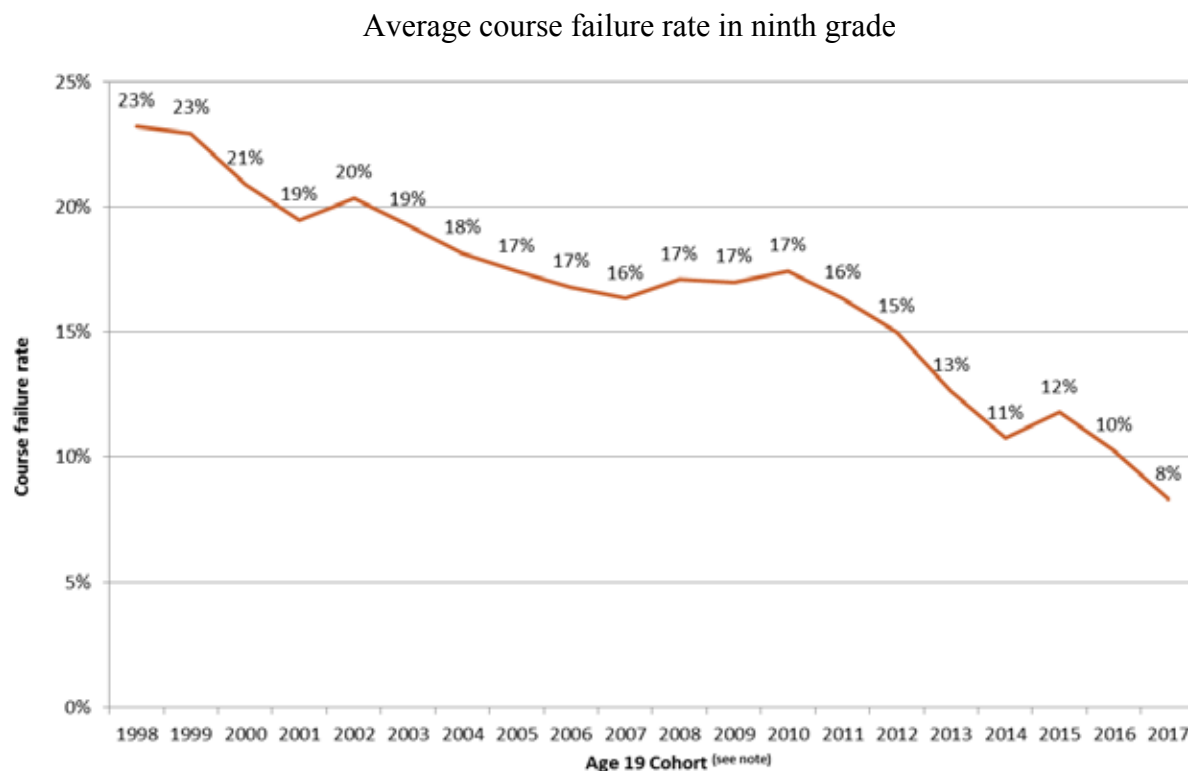
increased from under six classes prior to 6.5 classes with the 2002 cohort (see Figure 28), and continued to increase until it was typical for students to take seven classes during their ninth-grade year. In 2003, the district introduced the ninth-grade on-track indicator as a school accountability metric, which encouraged schools to pay attention to credit accumulation and pass rates in the ninth-grade year. The district provided further support in 2008, with real-time data tools that identified students at risk of failing classes before the start of high school, and monthly during the school year, so that educators could design support systems for students that were falling off-track to graduation. Accompanying these policy changes and supports, ninth-grade pass rates and credit accumulation increased further (see Figure 28 and Figure 29).

Figure 28: Students Attempted and Earned More Credits in Ninth Grade over Time



Note: Credits attempted and earned are calculated for the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Students who permanently transferred out of CPS during high school are not included in this figure, since they are not included in the graduation rate calculations.

Figure 29: The Average Ninth-Grade Course Failure Rate Has Fallen over the Years



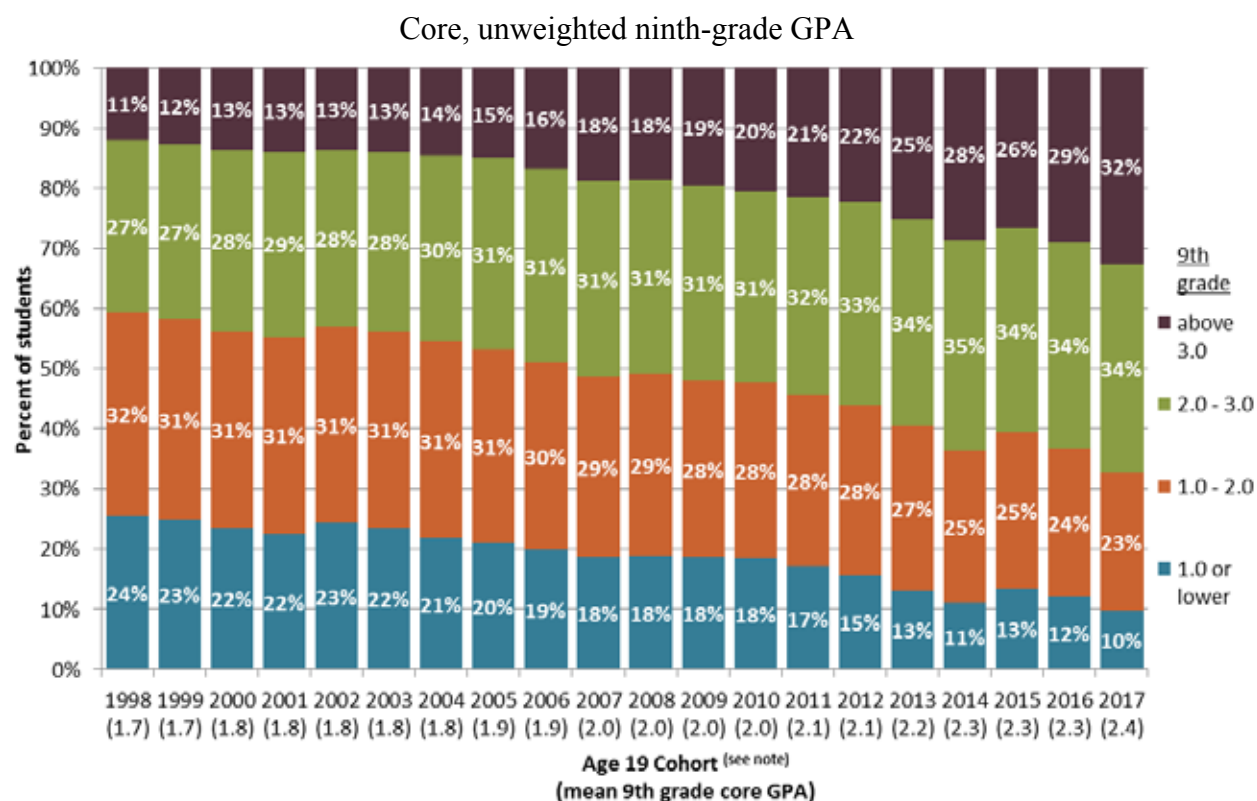
Note: Failure rate is calculated for the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Students who permanently transferred out of CPS are not included in this figure, since they are not included in graduation rates.

Students are earning higher grades in ninth grade than in the past

Given the decreases in course failure rates, it is not surprising that students’ ninth-grade GPAs have been improving over time. The average core, unweighted ninth-grade GPA for non-charter school students increased from 1.7 for the 1998 cohort to 2.4 for the 2017 cohort (see Figure 30).⁴⁸ During the same time period, the proportion of students earning above a 3.0 GPA (mostly As and Bs) in ninth grade increased from just 11 percent to 32 percent, while the proportion earning extremely poor grades, below a 1.0 GPA, decreased from 24 percent to 10 percent.

⁴⁸ Charter schools were not required to provide their students’ course grades to CPS, so we are unable to examine changes in charter school students’ GPAs. The figures on course grades and pass rates only include students who were not enrolled in charter schools.

Figure 30: Ninth-Grade GPAs Have Increased over Time



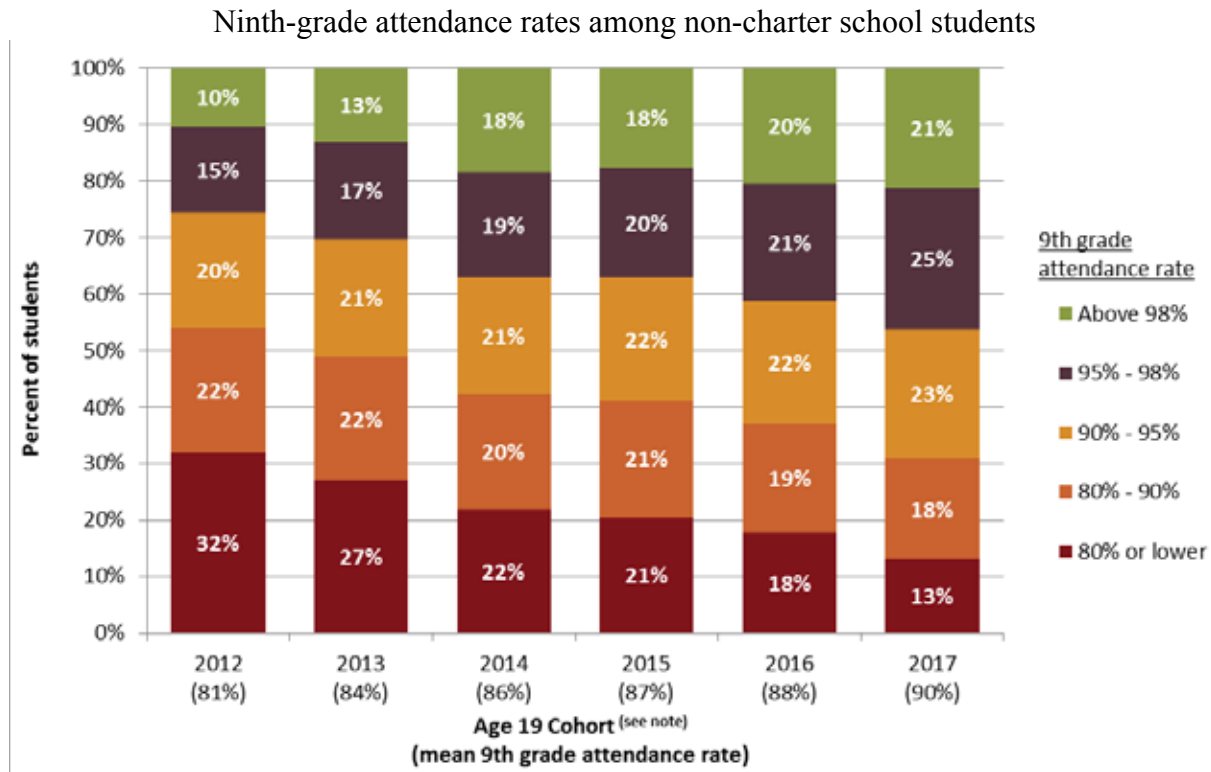
Note: GPA is calculated for the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Students who permanently transferred out of CPS during high school are not included in this figure because they are not included in the graduation rate. Students who attended a charter school or whose course grades were missing are not included in this figure.

Attendance in ninth grade has been improving

Attendance is, by far, the strongest predictor of course failure in the ninth grade.⁴⁹ Students need to be in school in order to participate in instruction and complete assignments, both of which contribute to passing classes and accumulating credits. The proportion of chronically absent ninth-graders (with attendance rates below 90 percent) has decreased substantially, at the same time that the proportion of ninth-graders with very good attendance (above 98 percent) has increased (see Figure 31). However, absenteeism remains a critical issue in high schools. Even in the most recent cohort of students for which we have data, 31 percent of students were chronically absent in their ninth grade year, missing 10 percent or more of their class time.

⁴⁹ Allensworth & Easton (2007); Rosenkranz et al. (2014).

Figure 31: Attendance Rates among First-Time Ninth-Graders Have Improved Considerably



Note: Attendance rate is calculated for the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Attendance rates are only shown for 2012 and later cohorts because of a change in the way attendance data were recorded that makes the data prior to 2007 (when most of the students in the cohorts prior to 2012 would have entered ninth grade) inconsistent with later years. Attendance data for charter school students have been inconsistently provided to CPS, so charter school students are not included in this figure. Students whose attendance data are missing (less than 1 percent of students) are not included in this figure. Students who permanently transferred out of CPS during ninth grade are not included in this figure, since they are not included in on-track rates.

Improvements in course performance account for most of the increase in graduation rates among recent cohorts

Students’ ninth-grade course performance has changed substantially since the early 1990s. Students are enrolling in more classes, failing fewer of them, and earning more credits as a result. They are also coming to class more often and more likely to earn As and Bs than ever before. Figure 32 shows that improvements in the number of credits attempted and earned in the ninth grade, and also improvements in ninth-grade GPA, account for most of the remaining increase in graduation rates that had not been previously accounted for by changes in students’ background characteristics or by incoming achievement.⁵⁰ However, graduation rates should

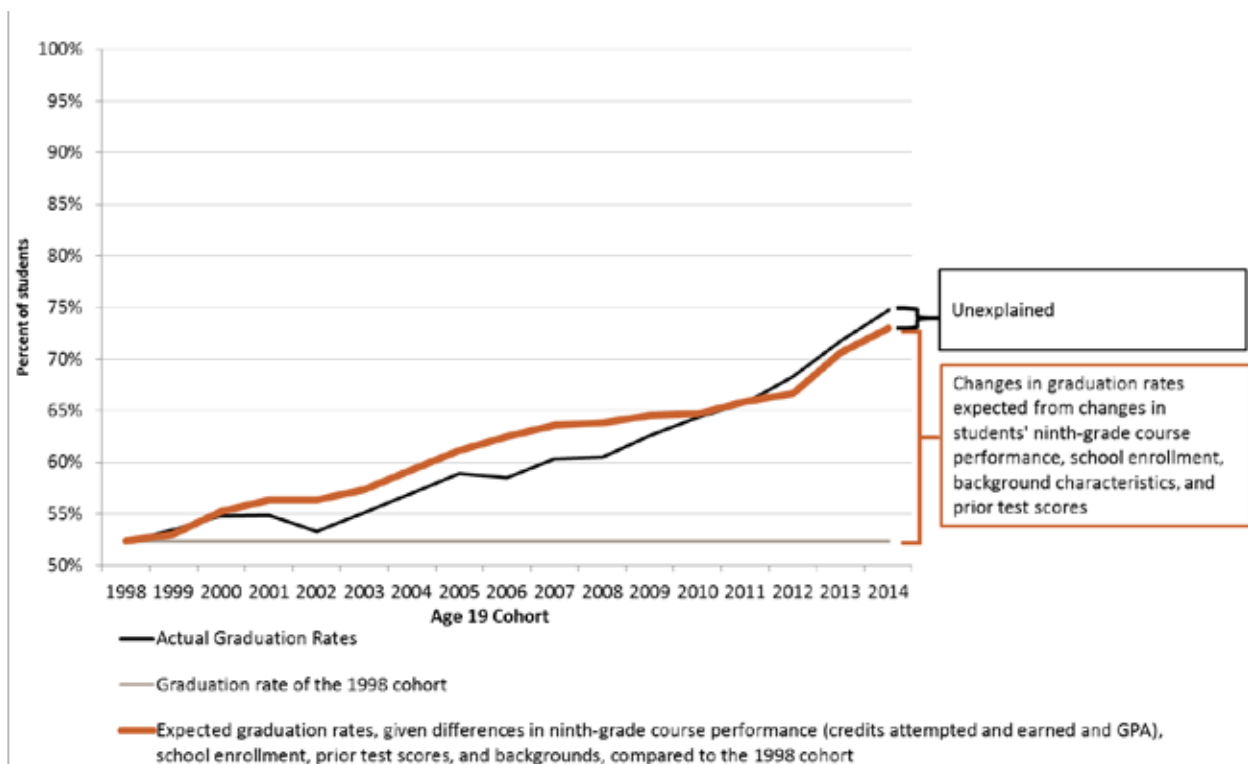
⁵⁰ Once changes in credits attempted and earned and changes in GPA have been taken into account, changes in the on-track rate and changes in the failure rate do not explain any substantial increase in the graduation rate. Most likely this is because these are strongly related to the number of credits earned.

have improved more than they did from 2001 to 2009, given the strength of students' ninth-grade course performance. The 2002 cohort was the first cohort that was subject to the new graduation requirements that were put in place in 1997. Students might have found it more difficult to attain the 24 credits that were required, or struggled in the advanced courses that were not previously required of tenth- and eleventh-graders.⁵¹

Credits earned during the ninth-grade year were the most important of the ninth-grade factors for explaining increases in graduation rates (see Table A.1 in Appendix A). Students need to earn at least five full year course credits during their ninth-grade year to be promoted to tenth grade and be on-track to graduate within four years. Earning fewer than six full year credits during their first year in high school means that students must take a higher load in subsequent years or else enroll in summer school in order to graduate, neither of which may be feasible or appealing.

Figure 32: Improvements in Graduation Rates Are Mostly Explained by Improvements in Ninth-Grade Course Performance

Graduation rates expected from differences in students' ninth-grade course performance, school enrollment, prior test scores, and backgrounds, compared to actual graduation rates



Note: See Appendix A for the models used to produce the data in this table. Including ninth-grade GPA in the model fully explains the remaining increase in graduation rates and in fact over-explains the increase in graduation rates in many years, as indicated by the adjusted graduation rate line going below the line showing the graduation rate of the first cohort.

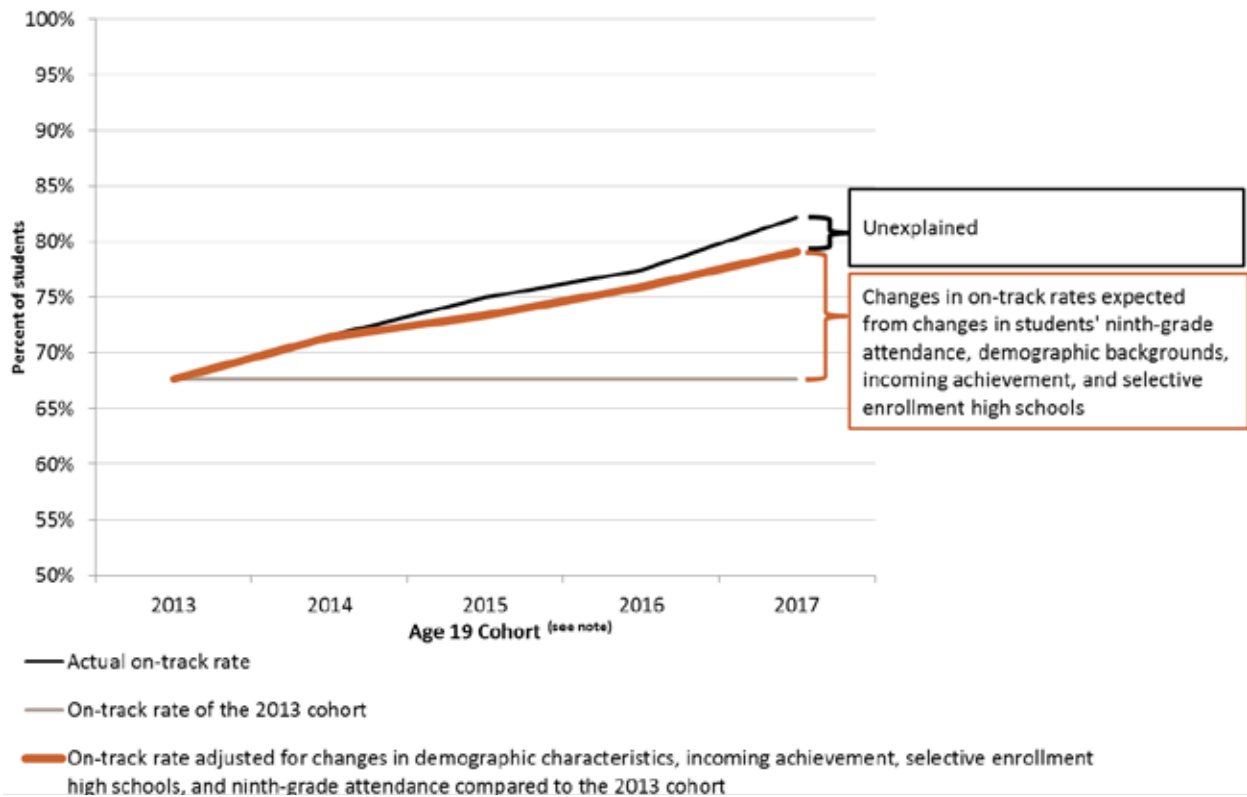
⁵¹ Montgomery & Allensworth (2010).

Changes in students' ninth-grade attendance account for most of the improvements in on-track rates left unexplained by incoming achievement

Chapter 3 showed that changes in students' background characteristics and incoming skills, especially their math scores and eighth-grade GPAs, could explain most of the increases in on-track rates from the 2013 cohort to the 2016 cohort, but only about half of the increase with the 2017 cohort. Ninth-grade attendance is strongly related to students' on-track status and has increased substantially over the last five cohorts. Adding ninth-grade attendance to the model predicting on-track rates accounts for almost all of the increase through 2017 (see Figure 33). The remaining increase could be explained by other changes in students' experiences in ninth grade, such as better academic behaviors or additional supports from their schools or nonprofit organizations intended to improve grades and pass rates that we do not account for in our models. We do not include credits earned, course grades, or failures to predict on-track rates, since these variables are largely measuring the same thing—students' course performance.

Figure 33: Changes in Ninth-Grade Attendance Explain a Large Proportion of the Improvements in On-Track Rates

On-track rates expected from differences in students' ninth-grade attendance rates, school enrollment, prior test scores and backgrounds, compared to actual on-track rates



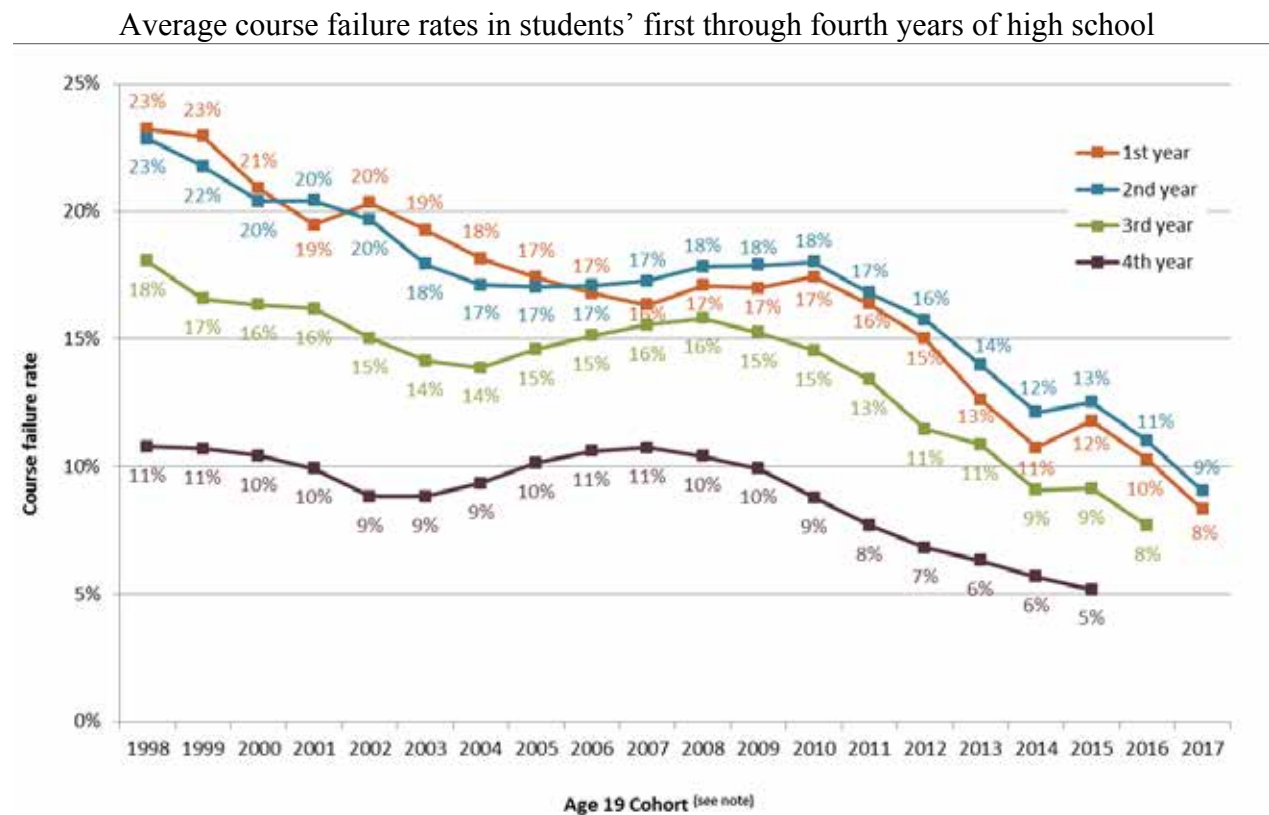
Note: On-track status is determined in the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. See Appendix A for the model used to produce the data shown in this figure, and see Table A.2 for a summary of the potential influence of each factor on its own.

Course performance has improved in grades 10-12, as well as ninth grade

As shown above, improvements in students' ninth-grade course performance could explain the increases in the high school graduation rate over the last two decades. While students' ninth-grade performance is highly predictive of whether they eventually graduate, students who are on-track at the end of ninth grade still must pass their classes in subsequent grades in order to graduate. Students who are off-track must figure out how to recover the credits that were lost due to course failure, as well as pass classes in tenth through twelfth grades.

Figure 34 shows that course failure rates have been decreasing over time for high school students in all grades, not just ninth grade. Cohorts that showed lower failure rates in the ninth grade also showed lower failure rates in subsequent years. In addition, pass rates in students' third and fourth years of high school improved slightly for earlier cohorts. Some of the improvements in graduation rates from the 2008 cohort on may have resulted from improvements in pass rates in later grades, as well as improvements in pass rates among ninth-graders. We cannot estimate the potential influence of course performance on improvements in graduation rates, however, because the relationships become tautological; students must remain in school in order to have pass/fail rates in their third and fourth years.

Figure 34: Course Failure Rates Have Been Decreasing in Later Grades of High School, as well as the Ninth-Grade Year

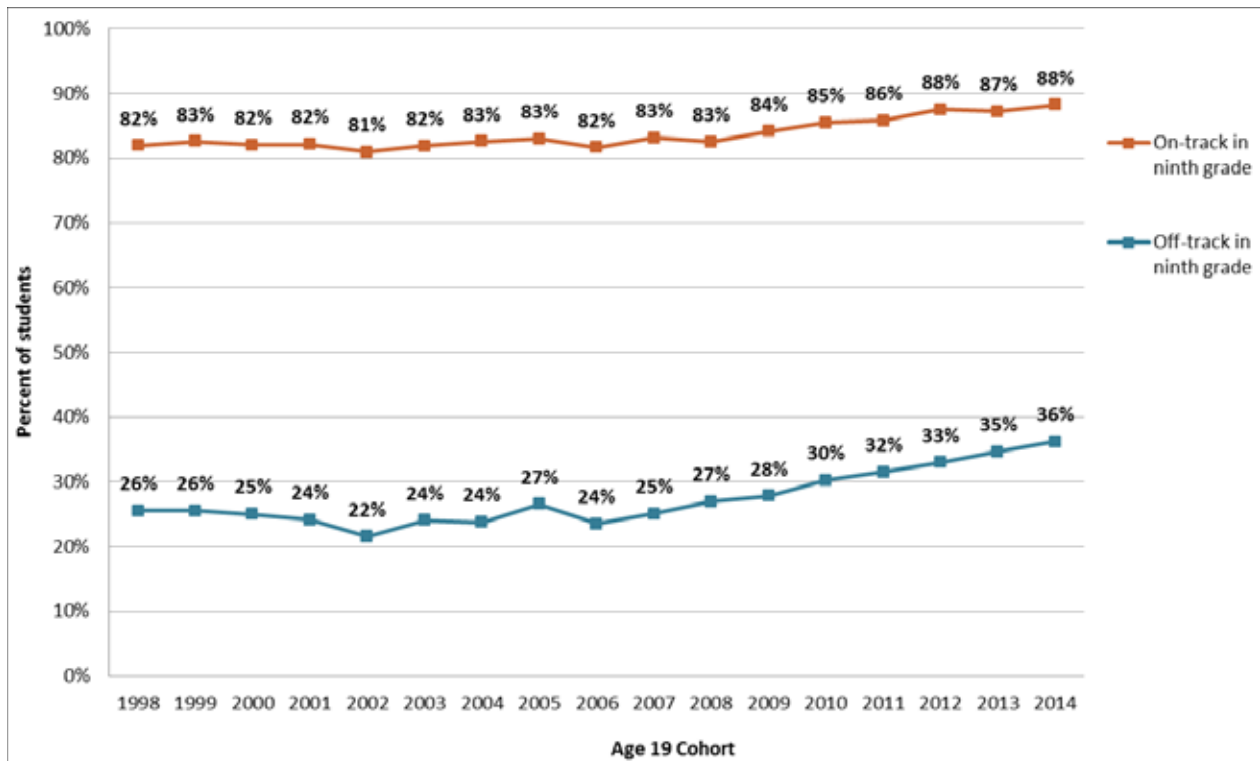


Note: First year course failure rates are calculated for the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same. Students who permanently transferred out of CPS during the high school years are not included in this figure, since they are not included in the graduation rate statistics. Students are only included in a given year’s statistic if we have course grades for both spring and fall semesters. Course failure rates are much lower for students in their third and fourth years of high school than in their first or second years because many students with worse performance have already dropped out of high school. On average, students’ pass rates do not improve the longer they are in school. Charter school students are not included in this figure, since their grades and credits are not reported to the district.

Not only have pass rates improved at all grade levels, but students who do fall off-track for graduation in ninth grade are also graduating from high school at increasingly higher rates over time (see Figure 35). This suggests that students in more recent cohorts were more likely than prior cohorts to recover the credits lost when they failed classes in ninth grade in later grades. Graduation rates for off-track students hovered between 24-26 percent until the cohort that turned 19 in the 2008 school year, after which they started to rise. That is the first year that schools began receiving credit recovery data reports from the district as part of their early warning indicator system. These credit recovery reports included students in all grades, not just first-time freshmen. We cannot say whether credit recovery rates improved because of the availability of those credit recovery data reports, or for other reasons, but the improvements did begin at the same time.

Figure 35: A Growing Proportion of Off-Track Students Are Graduating from High School

Percentage of students who graduated with a regular diploma by the time they were 19, by ninth-grade on-track status



Note: Charter school students are not included in this figure, since we are unable to determine their on-track status.

Chapter 4: Summary

Students’ experiences in high schools have changed substantially over the past two decades. More students enroll in selective enrollment and charter high schools and fewer students enroll in traditional high schools than in the past. We cannot assess charter school students’ course performance; but in other types of schools, students’ course performance has also changed over time. Students now take more classes and earn more credits during their ninth-grade year. Credit accumulation has also risen because students are failing fewer classes during ninth grade. In recent years, attendance during ninth grade has improved considerably, which has likely contributed to higher pass rates.

While students are attending many more and different types of high schools than 20 years ago, changes in the kinds of schools students attend explains only a small portion of the increase in on-track or graduation rates over time. Instead, improvements in students’ ninth-grade course performance, especially the number of credits students earn in ninth grade, account for most of the improvements in graduation rates. Better course performance and more students getting back on-track in later grades also likely contributed to higher graduation rates. Improved ninth-grade attendance helps to explain the most recent increase in on-track rates.

Chapter 5: Interpretive Summary

There have been substantial changes in CPS high school performance over the last two decades. Graduation rates have improved considerably, at the same time that the quality of a CPS diploma has gone up—with students taking more rigorous classes and showing better performance on standardized tests. In fact, graduates are higher-achieving now—when about three-fourths of students graduate—than when only half of students graduated. The improvements are not simply a result of serving students with higher incoming skill levels or different backgrounds, or because of tricks or errors in data—although these factors affected the trends in graduation rates to a varying extent across the years. Students entering CPS high schools are enrolling in more classes, showing higher attendance and higher pass rates than students with similar incoming skills and backgrounds who enrolled in the same schools in prior years. They are much more likely to be on-track for graduation at the end of ninth grade, to stay on-track, and to recover and eventually graduate if they do fall off-track. CPS high schools seem to be doing a much better job supporting and educating students than in the past.

Students are also entering CPS high schools with higher achievement levels than in the past. Improvements in students' entering skills contributed to improving graduation rates prior to 2008, and also to the improvements in on-track rates in the most recent cohorts. Many new high schools have opened over the past 20 years, and a number of the new charter and selective enrollment high schools had higher graduation rates when they started than other schools in the district. These new schools may have attracted higher-achieving students to attend high school in CPS, which could account for some of the improvements in graduation rates. However, most of the improvements in district graduation rates have come from higher course pass rates in non-charter non-selective enrollment high schools.

There has been a tremendous amount of activity over the last two decades aimed at getting more students to graduate high school and to be prepared for college. High schools have been monitoring students' grades, attendance, and test scores through data systems and reports, and developing strategies to reach out to help students who fall behind. Many schools have on-track coordinators and teacher teams that use data to identify students who need support. The district has emphasized the importance of students' grades and attendance through messaging and by including on-track and attendance metrics, as well as test scores, on district accountability scorecards. In addition, CPS schools are working with a number of organizations that are explicitly supporting students' grades, attendance, behavior and learning, such as OneGoal, City Year, Umoja, and Gear Up. Over the past 10 years these organizations have expanded their efforts and are now working with thousands of students in schools across the city. All of these efforts within schools across the district seem to have paid off—students are much more likely

to pass their classes than ever before, and those who do fail are more likely to recover sufficient credits to eventually graduate.

Chicago is a district where 88 percent of students qualify for free and reduced price lunch—the average school has more than twice the poverty rate of schools the federal government considers to be low-income schools (i.e., qualifying for Title I funds). Furthermore, the level of poverty in some schools is extreme, with many students not just living in “working poor” neighborhoods, but in neighborhoods where over 60 percent of males are unemployed and most families live under the poverty line. Low graduation rates are one symptom of concentrated poverty in schools.⁵² The improvements in Chicago’s graduation rates suggest that sustained efforts can make a considerable difference for improving high schools, even when they serve the most disadvantaged communities. However, this means working against the many forces that make it difficult to show strong outcomes in low-income schools. It takes substantial and coordinated work to make this happen.

Yet as graduation rates and course pass rates have gone up, there have been concerns about schools trying to “game” the system—by miscoding student records (by accident or on purpose), encouraging students to transfer to schools with easier graduation requirements, or giving students passing grades when they have not fulfilled course requirements. These problems are likely occurring in some schools. Particularly from 2006 to 2008, more students were coded as transferring out of CPS, and this increase in transfer rates could account for the increase in graduation rates during those years. Such trends are troubling. It is extremely important for the district to work to have clean student records through training, verification, and audits, so that everyone can be certain of the resulting statistics and fairly judge district progress. Even though the level of uncertainty is much smaller than the size of the gains in graduation rates, doubt about the quality of the data lead the public to dismiss the improvements, rather than recognize the gains that have been made.

Another caveat to the good news about increasing graduation rates is that there are still low levels of academic engagement in many schools and thousands of students who fail to earn a diploma. Improvements have been made in comparison to a time when half of students failed to graduate and the typical high school student missed almost two months of school. A quarter of students still do not earn a diploma by age 19. Given the dire prospects for students who do not graduate from high school, this is far too many students failing high school. High school students still miss about a month of class time, on average, and fail over 10 percent of their courses. African American students and male students graduate at particularly low rates.

High school graduation efforts are now more focused on prevention and recovery than they were in the past. Previously, dropout prevention efforts were aimed at students who were already halfway out the door—students failing half of their classes or rarely coming to school. There is increasing recognition that even one course failure is bad for students; it leads them to withdraw effort—rather than motivating them to work harder.⁵³ Instead of waiting until students are close to dropping out to intervene, schools and school partners are working to prevent students from

⁵² For example, see Harding (2003); Wodtke, Harding, & Elwert (2011); South, Baumer, & Lutz (2003).

⁵³ Allensworth & Easton (2005); Rosenkranz et al. (2014).

failing in the first place, and increasing recovery rates among those students who do fail. Students are attending class more often, and both their grades and their test scores are improving. The school district is now aiming to get all students ready to succeed in college by the time they graduate. Ensuring more students graduate high school is the first step towards this goal. Because more students are engaged and on-track to graduate, schools are increasingly able to focus on the college-readiness of their graduates.

In a time of budget constraints and leadership transitions, there is a risk that successful efforts will be discarded in favor of new, untested initiatives, or because of financial concerns. Chicago's graduation requirements are higher than those of the state of Illinois, and its students are increasingly taking more rigorous coursework than in the past. Students are coming to class more often, and showing stronger learning gains than in the past. While high school graduation alone will not guarantee success in college or career, it is a minimum threshold that students need to meet to have a modest chance of college or career success. It is important to recognize the efforts that have led thousands more students each year to obtain high school diplomas, along with all of the benefits for employment, health, and life that are so strongly associated with this one milestone.

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Appendix A: Data and Methods

Data sources

This study used archival data on CPS students, including administrative records describing students' race and ethnicity, gender, age, residential census block, graduation status, test score records, and transcript records, as well as files documenting whether transfers out of the district have been verified. To measure neighborhood poverty, we matched each student's residential census block group to census data describing the percent of families who live below the poverty line in each block group, imputing data for each year in which no census data was collected.

The population of students included in the study

All students who entered CPS high schools as first-time ninth-graders were included for analysis in this study, if they met the following criteria:

- Students in the study were enrolled as ninth-graders at the beginning of the school year (by the 20th day), or they transferred into CPS as ninth-graders in the middle of the year and stayed long enough to receive course grades for at least one semester. Thus, transient students who transferred into the district in the middle of the year and left before the end of the semester were not included. Because charter schools do not provide their students' course grades to CPS, students who transferred from another district into a charter high school in CPS in the middle of the year are included in the cohort regardless of whether or not they stayed long enough to receive grades for that semester.
- Students in the study were enrolled as ninth-graders at some point in a CPS high school (including neighborhood, charter, selective enrollment, alternative, military, specialty, and vocational schools, as well as Transition Centers/Academic Preparatory Centers/Achievement Academies).⁵⁴ Students who began high school at an alternative school were only included if they were actively enrolled in a CPS school in the previous school year. Many alternative schools were designed to serve students who dropped out of other schools. Students who entered CPS through an alternative school, after not being actively enrolled in a CPS school, were not included because these students could have enrolled in the alternative school after dropping out of school in another district.

⁵⁴ Students at Transition Centers/Academic Preparatory Centers/Achievement Academies were schools for students who had not passed the eighth-grade promotion standards but were too old to remain in elementary school (16 years or older). Students were counted as ninth-graders regardless of the grade indicated in their administrative records if they enrolled at one of these types of schools.

Students were grouped into cohorts based on their age, regardless of the year they began high school. Students are grouped into age cohorts by their birthday so that students who turn 14 during the same school year (defined as September 1 through August 31) are included in the same cohort. Table 1 in Chapter 1 lists the number of students in each cohort. Analyses of the factors influencing graduation rates do not include students who could not graduate from CPS because they transferred out of the district, or because of institutionalization, incarceration, or death.

Methods for determining students' outcomes at age 19

Table 1 in Chapter 1 lists the number of students in each cohort who earned a regular diploma, earned an alternative diploma, dropped out, and transferred to another school district. To determine each student's outcome at age 19, we use district administrative records on students from the fall after the school year in which students in the cohort turned 19 (a snapshot is generated on the 20th day of school). These files include records for both active and inactive students. For students who are not actively enrolled, we use their leave code (i.e., the reason for leaving) and their last school ID number to assign them to one of five outcomes: graduated with a regular diploma, graduated with an alternative diploma, dropped out, transferred out of CPS, or other (incarceration, institutionalization, death). Students whose leave code indicates they received a regular diploma but whose last school was an alternative school are recoded as having graduated with an alternative diploma, which is counted as a non-graduate. Students whose leave code indicates that they transferred out of CPS but whose last school was an alternative school are recoded as having dropped out. Students who are still active are assigned a status as still enrolled, and they are counted as non-graduates.

Methods for calculating incoming test scores

Students' incoming reading and math test ability is calculated using the entire set of elementary test scores available for each student, which typically includes test scores from third through eighth grade. These provide a measure of students' latent ability; latent eighth-grade scores are more accurate than the original eighth-grade test scores, and better predictors of high school graduation, because they are constructed using multiple scores which helps to remove the random variation in any single test score.⁵⁵ From 1992 to 2005, CPS students in grades 3-8 took the Iowa Test of Basic Skills (ITBS). Since 2006, they have taken the Illinois Standardize Achievement Test (ISAT). To calculate students' latent eighth-grade score, we first convert ITBS scores to ISAT scores, using the techniques developed in Luppescu et al. (2011).

⁵⁵ Allensworth et al. (2002).

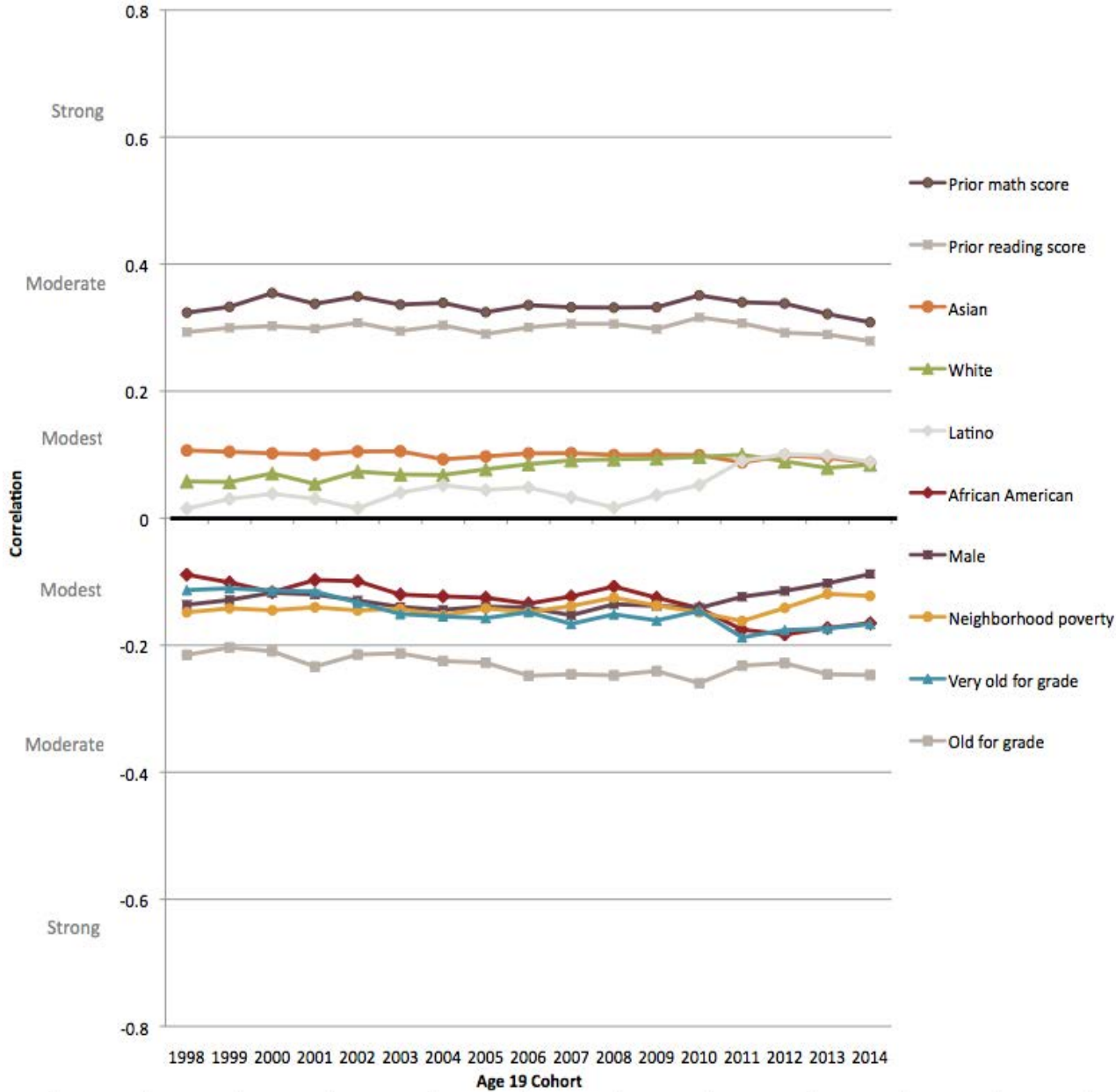
Correlations of graduation with students' background characteristics

There are differences in graduation rates by race and ethnicity, neighborhood poverty, and gender, but students' probability of graduating is not strongly defined by these background characteristics (see Figure A.1). Whether students are older than age 14 when they start high school, and their prior math and reading scores, have stronger relationships with graduation than race and ethnicity, gender, or neighborhood poverty. All of the relationships have stayed fairly constant over time, although the relationship between gender and high school graduation has become slightly weaker over the last several cohorts. There have also been some small changes by race and ethnicity as Latino students' graduation rates have increased more than African American students' graduation rates, as shown in Chapter 1.

Students' ninth-grade GPA, credits earned in ninth grade, freshman on-track status, and ninth-grade course failure rate all have stronger relationships with eventually graduating from high school than students' background characteristics or their test scores (compare Figures A.1 and A.2). The type of school students attend is less strongly related to whether they graduate than is students' performance at their high school.

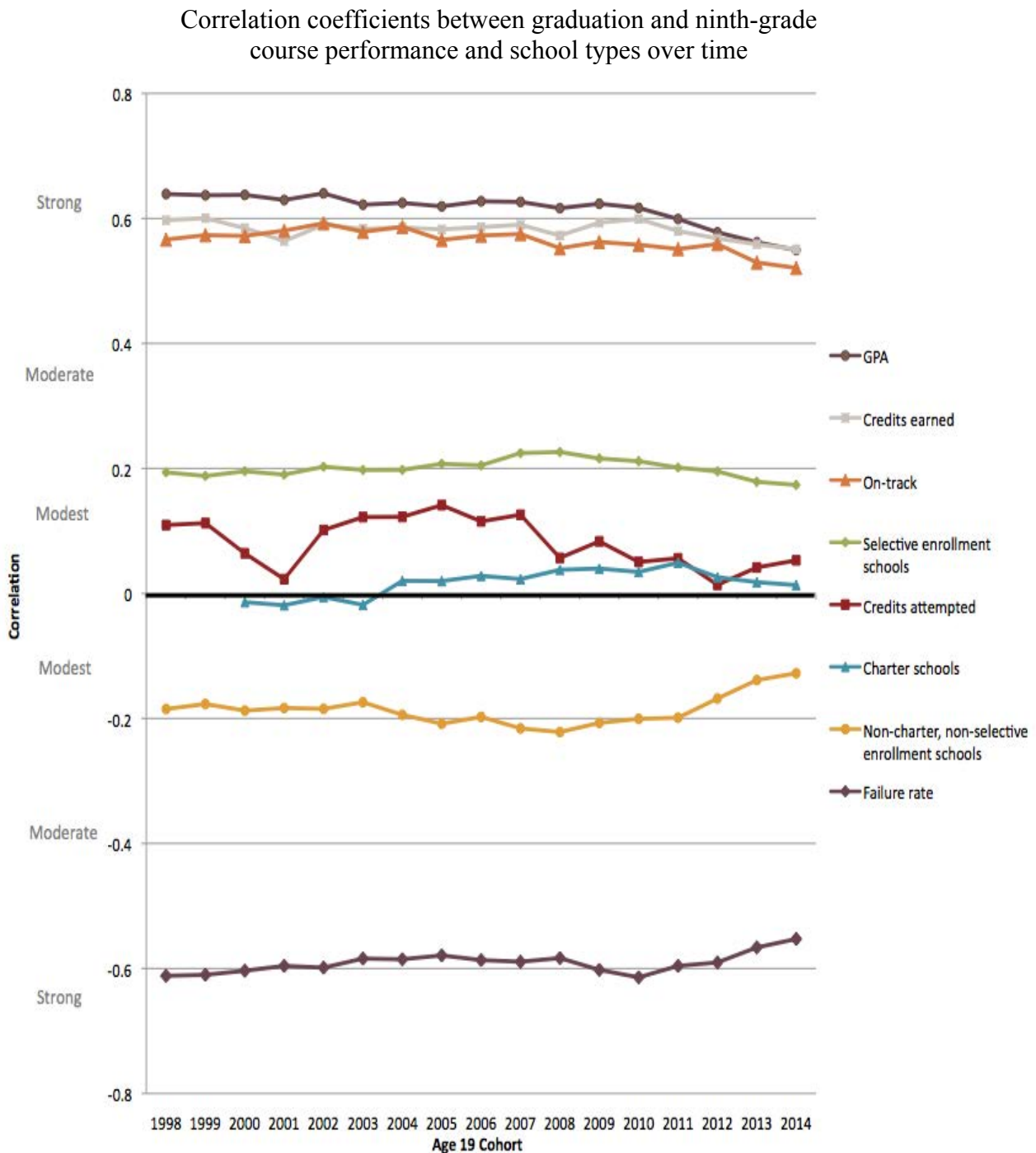
Figure A.1: Prior Test Scores Have a Stronger Relationship with High School Graduation than Race and Ethnicity, Gender, or Neighborhood Poverty

Correlation coefficients between graduation and background characteristics over time



Note: Lines that are further from the “zero” line represent stronger relationships with high school graduation. Those above the zero line are positive relationships; those below the line have negative relationships, so that higher values are associated with a decreased likelihood of graduating. Lines that become closer to zero show that the relationship of that factor with graduation is getting weaker over time. Old-for-grade students began ninth grade at age 15; very old-for-grade students began high school at age 16 or older.

Figure A.2. Indicators of Ninth-Grade Course Performance Have Strong Relationships with Graduation



Note: Lines that are further from the “zero” line represent stronger relationships with high school graduation. Those above the zero line are positive relationships; those below the line have negative relationships, so that higher values are associated with a decreased likelihood of graduating. Lines that become closer to zero show that the relationship of that factor with graduation is getting weaker over time.

Models predicting changes in high school graduation and freshman on-track rates

To estimate the degree to which graduation rates would be expected to change, given differences in students' backgrounds, prior achievement, and ninth-grade school performance, we first calculated the relationships of these variables—either single variables or clusters of variables—with graduation or on-track rates. As noted above (see Figures A.1 and A.2), the relationships of most of the variables were consistent over time; however, there were some small changes. We were hesitant to rely on coefficients estimated solely from the base cohort, given that some of the relationships showed changes over time, particularly those that reflected ninth-grade performance, such as the relationship of credits attempted with graduation rates. Therefore, we used the average relationships of the variables with graduation/on-track rates, across all of the cohorts, to estimate the changes that would be expected in graduation rates, given the changes in the variables being studied.

To estimate the relationships of the variables with graduation/on-track rates, we ran a series of logistic regression models that predicted graduation/on-track rates with one or more variables. The models included dummy variables for each cohort other than the base cohort to capture residual variation in graduation/on-track rates associated with the cohort above and beyond the other variables included in the model. To account for any nonlinearity in the relationships of background factors with graduation, continuous variables were binned into discrete dummy variables capturing small ranges of values. We also included dummy variables capturing students with different sources of missing data. For example, our data archive does not include course performance (grades) of students attending charter schools in the middle grade years. These students are included in the analyses, but their course performance is captured by a dummy variable representing students who attended charter schools in eighth grade.

The parameter estimates for the age cohort dummy variables provide the difference in graduation rates between the 1998 cohort and each age cohort, net of the other factors included in the model. By subtracting the cohort dummy parameter estimate from the fitted value for each student in the cohort, we eliminated any change in graduation rates not attributable to the factors in the model, relative to the base cohort. The adjusted fitted value was then transformed from a logit into a probability for each student, and averaged for each cohort. Table A.1 shows the actual graduation rates for each cohort, and the graduation rate that would be expected had the base cohort (1998) had similar characteristics as each of the subsequent cohorts on the covariates presented in each row. Analyses of on-track rates use exactly the same procedure, but with a different base cohort (see Table A.2).

Table A.1: Expected Graduation Rates for Cohorts Based on Changes in Background Characteristics, Incoming Achievement, Ninth-Grade School Type, and Ninth-Grade Course Performance, Compared to the Base Cohort

Cohort: Year when 14-years-old to 19-years-old	1993- 1998	1994- 1999	1995- 2000	1996- 2001	1997- 2002	1998- 2003	1999- 2004	2000- 2005	2001- 2006	2002- 2007	2003- 2008	2004- 2009	2005- 2010	2006- 2011	2007- 2012	2008- 2013	2009- 2014
Actual Graduation Rates	52.4	53.4	54.8	54.9	53.3	55.1	57.0	58.9	58.5	60.3	60.5	62.6	64.4	65.8	68.3	71.8	74.8
Expected graduation rates after accounting for changes in:																	
Race and Ethnicity	52.4	52.4	52.5	52.6	52.7	52.8	52.6	52.8	52.7	52.7	52.6	52.6	52.7	52.8	52.8	52.9	53.4
Neighborhood Poverty	52.4	52.4	52.5	52.8	52.9	53.0	53.2	53.5	53.5	53.6	53.6	53.7	53.9	54.1	54.1	54.3	54.5
Gender	52.4	52.3	52.3	52.3	52.2	52.2	52.2	52.1	52.1	52.2	52.2	52.2	52.2	52.2	52.3	52.3	52.3
Old or Very Old-for-Grade	52.4	52.8	53.3	53.0	52.1	52.2	51.7	52.2	52.3	51.0	51.4	51.2	51.5	52.2	51.6	52.5	53.4
Eighth-Grade Math Test Scores	52.4	52.6	51.8	53.3	54.7	56.7	58.1	59.0	59.6	60.2	59.8	59.3	58.3	57.1	56.8	56.3	58.3
Eighth-Grade Reading Test Scores	52.4	50.6	50.3	51.4	52.1	53.0	54.0	54.7	54.9	54.6	54.0	54.5	54.9	54.9	54.2	53.9	55.0
Ninth-Grade School Type	52.4	52.4	52.5	52.8	52.9	53.0	53.4	54.0	53.5	53.7	54.2	53.7	54.0	54.3	54.8	55.1	55.7
Ninth-Grade Credits Attempted and Earned	52.4	52.7	54.6	55.1	56.5	56.9	58.6	59.9	61.3	62.6	62.7	63.5	63.3	64.1	64.9	68.0	69.5
Ninth-Grade GPA	52.4	52.9	54.9	55.7	54.4	55.2	56.6	57.6	58.8	60.3	60.1	60.8	61.2	62.3	63.3	67.0	68.8
Combination of Indicators																	
Background Characteristics (race and ethnicity, poverty, gender, age) (Figure 19)	52.4	52.8	53.4	53.3	52.5	52.7	52.3	53.0	53.1	52.1	52.4	52.2	52.7	53.5	53.0	54.1	55.3
Background characteristics + Eighth-Grade Test Scores (Figure 24)	52.4	52.7	52.5	53.5	53.9	55.5	56.2	57.5	57.9	57.7	57.7	57.2	57.0	56.7	56.3	56.7	59.0
Background characteristics + Eighth-Grade Test Scores + Ninth-Grade School Type (Figure 27)	52.4	52.7	52.6	53.6	54.0	55.5	56.4	57.7	58.0	57.7	57.9	57.4	57.2	57.3	57.2	57.8	60.3
Background characteristics + Eighth-Grade Test Scores + Ninth-Grade School Type + Ninth-Grade Credits Attempted and Earned + Ninth-Grade GPA (Figure 32)	52.4	53.0	55.3	56.3	56.4	57.4	59.3	61.2	62.5	63.6	63.8	64.5	64.7	65.9	66.7	70.6	73.0

Note: How to read this table: Compare the graduation rate expected for each cohort to the base cohort (left column of numbers), to find the degree to which graduation rates would be expected to change given the changes observed in the variables for that row. Compare the graduation rate expected for each cohort to the actual graduation rates (at the top of the table) to determine the degree to which the variables in that row could explain the increase in graduation rates for that cohort, relative to the first cohort.

Table A.2: Expected Freshman On-Track Rates for Cohorts Based on Changes in Students' Demographic Backgrounds, Incoming Achievement (Eighth-Grade GPA, Attendance, and Test Scores), Ninth-Grade School Type, and Ninth-Grade Attendance, Compared to the Base Cohort

Cohort: Year when 14-years-old to 19-years-old	2008 2013	2009 2014	2010 2015	2011 2016	2012 2017
Actual on-track rate	67.6	71.5	74.9	77.4	82.1
Expected graduation rates accounting for changes in:					
Race and ethnicity	67.6	68.1	68.3	68.5	68.5
Neighborhood poverty	67.6	67.8	67.6	67.5	67.5
Gender	67.6	67.7	67.7	67.7	67.7
Old or very old for grade	67.6	68.1	68.3	68.7	68.8
Prior math test scores	67.6	69.2	71.2	73.0	73.8
Prior reading test scores	67.6	68.6	69.7	71.2	72.6
Eighth-grade GPA	67.6	69.5	71.4	73.0	73.9
Eighth-grade attendance	67.6	68.8	69.9	69.7	70.1
Type of high school (selective enrollment)	67.6	68.1	68.3	68.8	68.5
Ninth-grade attendance	67.6	71.3	72.5	74.6	77.8
Combined predictor models					
Race + neighborhood poverty + age + gender (Figure 20)	67.6	68.4	68.7	69.2	69.2
Race + neighborhood poverty + age + eighth-grade GPA + eighth-grade attendance + math standardized test scores + reading standardized test scores (Figure 25)	67.6	70.1	72.5	73.8	74.8
Race + neighborhood poverty + age + eighth-grade GPA + eighth-grade attendance + eighth-grade test scores + selective enrollment high school	67.6	70.1	72.5	73.9	74.9
Race + neighborhood poverty + age + eighth-grade GPA + eighth-grade attendance + eighth-grade test scores + selective enrollment high school + ninth-grade attendance (Figure 33)	67.6	71.4	73.4	75.9	79.1

Note: How to read this table: Compare the on-track rate expected for each cohort to the base cohort (left column of numbers) to find the degree to which on-track rates would be expected to change given the changes observed in the variables for that row. Compare the graduation rate expected for each cohort to the actual graduation rates (at the top of the table) to determine the degree to which the variables in that row could explain the increase in on-track rates for that cohort, relative to the first cohort.

Appendix B: Calculating a Cohort Graduation Rate

A graduation rate may seem straightforward to calculate, but there are many technical decisions for which there are not always clear cut methods or procedures. In its most simple form, a graduation rate is calculated by dividing the number of graduates by the number of students who could have graduated. But analysts must make decisions about how to count students who transfer in or out of the district; how to count students who earn an alternative diploma or GED instead of a regular high school diploma; and how to be sure new methods for collecting, storing, and validating data have not introduced changes to the data that could affect their accuracy or the comparability of graduation rates over time.

There is no one best method for calculating high school graduation rates. Different methods will be more or less useful for different purposes and more or less valid and reliable for different types of students.⁵⁶ Decisions that favor accountability may not be best for program evaluation, and neither may be best for most accurately displaying the true state of schools. Trade-offs must be made in terms of accuracy, inclusiveness, lack of bias, need for accountability, and data entry requirements.⁵⁷ Measuring trends in graduation rates also depends on having consistent data over time—data that are gathered, cleaned, and analyzed in the same way over many years. With changes in data systems and definitions of who counts as a graduate, data change in ways that could affect graduation rate calculations.

Most states and districts now use the graduation rate statistic recommended by the National Governors Association (NGA), which is a cohort rate that follows a group of beginning ninth-graders for four years.⁵⁸ Many of the statistics that were used prior to the adoption of the NGA method were shown to produce biased estimates of the percentage of students who graduate from schools or districts.⁵⁹ There is greater consistency, now, in the use of the same type of statistic for calculating graduation rates across districts and states. Yet, there are still differences in who is counted in the numerator and denominator of the statistic, given the ways in which data are recorded in different places and the purpose of the statistic.

⁵⁶ U.S. Department of Education (2005); Swanson (2004).

⁵⁷ Committee on Improved Measurement of High School Dropout and Completion Rates (2010).

⁵⁸ National Governors Association Task Force (2005).

⁵⁹ Swanson (2004); Warren (2004); Mishel & Roy (2006).

This appendix describes three areas where data issues and technical decisions can have a large influence on the Chicago Public Schools' graduation rate. These issues tend to exist in all districts and must be addressed with decision rules about the calculation. This appendix explains how we dealt with each issue to produce the graduation rates analyzed in this report. We focus here on the issues that have the largest potential influence on the calculation and then examine the degree to which those issues could account for the trends in improving graduation rates in the district. Note that decision rules, and the underlying issues that require those decision rules, influence both the level and the trend in graduation rates. In other words, decisions about how to deal with various issues can affect the size of the graduation rate, and how much it has changed over time. These issues include: 1) defining which students to include in the cohort for whom the graduation rate is calculated; 2) dealing with ambiguity about the outcomes of students who leave the district; and 3) determining who to count as a graduate.

Defining who is in a cohort

Policies that hold students back from entering high school affect graduation rates for their cohort and later cohorts

Ninth-grade cohort graduation rate statistics follow students for four or five years from the time they start ninth grade. However, as shown in Chapter 3, the timing of students' entry into high school is affected by grade retention policies and practices in the elementary and middle grade years. This affects the comparability of graduation rates over time, as cohorts of ninth-graders are not equivalent. If large numbers of students are held back in elementary school one year because of the implementation of promotion standards, or because the standards are made more difficult to pass, the graduation rate for that ninth-grade cohort can improve simply because many low-achieving students from that cohort have been moved into the following cohort. In subsequent years, graduation rates may decline as more students enter ninth grade old-for-grade because they were held back in elementary school. This makes it difficult to interpret the trends in graduation rates over time, since cohorts of ninth-grade students are not comparable to each other.

As discussed in Chapter 1, a solution to this problem is to group cohorts of students based on their age, rather than on the year that they begin high school. Students can be grouped into cohorts based on when they turned age 13 or 14, and then followed until age 18, 19, or 20 to determine whether or not they graduated. In this report, we group students based on when they turned 14 and then follow them until they turn 19. Age cohorts are not affected by patterns of grade retention in elementary or middle schools. This makes age cohorts more accurate, stable, and unbiased for tracking graduation rates over time than cohorts defined by grade level.⁶⁰ One disadvantage of using age cohorts is that they are difficult to use for school accountability purposes, or by school practitioners who organize students by their year in school, rather than by their age.

⁶⁰ An additional benefit of using age cohorts is that special education students can be included with their age peers, even if they are in ungraded classrooms—a problem with statistics that are based on students' grade level.

Including students who enter high school in grades 10-12 can lead to higher rates; including those who transfer into ninth grade older than age 14 leads to lower rates

Another consideration when calculating cohort graduation rates is whether to include students who transfer into CPS after beginning high school in another district. When students enter the district as eleventh- or twelfth-graders, they have accumulated sufficient credits to be close to graduating. Because they were successful in other school districts, including these students in the calculation tends to result in a higher cohort graduation rate.⁶¹

Other students transfer into the district as ninth-graders, even though they are older than age 14. Many of these students have repeated grades, either prior to high school or after starting ninth grade, in another school district. They may have dropped out of other school districts and then enrolled in CPS. Because failure in the ninth grade means students are not accumulating the credits they need to graduate, including these students in the cohort tends to depress graduation rates.

This report takes a conservative approach to including students who transfer into the district. Only students who attend ninth grade in CPS are included, but that includes students who transfer into the district in ninth grade who are older than age 14. When students enter CPS at higher grades, we do not know at what age or academic skill level they began ninth grade. So we cannot determine whether there have been changes over time in the types of students who enter CPS at higher grades. While this decision helps us to understand trends over time in graduation rates it biases the graduation rates we show in this report slightly downward. This is because we are not including students in the age cohorts who have transferred to CPS after earning sufficient credits to be sophomores, juniors, or seniors. But we are including students who have transferred to CPS without sufficient credits to move out of the ninth grade.

Ambiguity about what happened to students who left the district: Dropouts versus transfers

Another issue when calculating cohort graduation rates is how to distinguish students who transfer to other districts from students who have dropped out. Students who transfer out of a district should not be included in the graduation rate because they cannot have graduated from their original district. Because in Illinois there is no central agency responsible for tracking students' movement between districts, tracking down students who are no longer attending school becomes the responsibility of individual schools and districts. In some cases, a district knows that a student transferred to another district because the student's new school sent a request for the student's records to their old school. In other cases, it is known that a student dropped out. Often, however, there is uncertainty about what happened to a student who is no longer attending school. This ambiguity is a particular concern because the graduation rate will

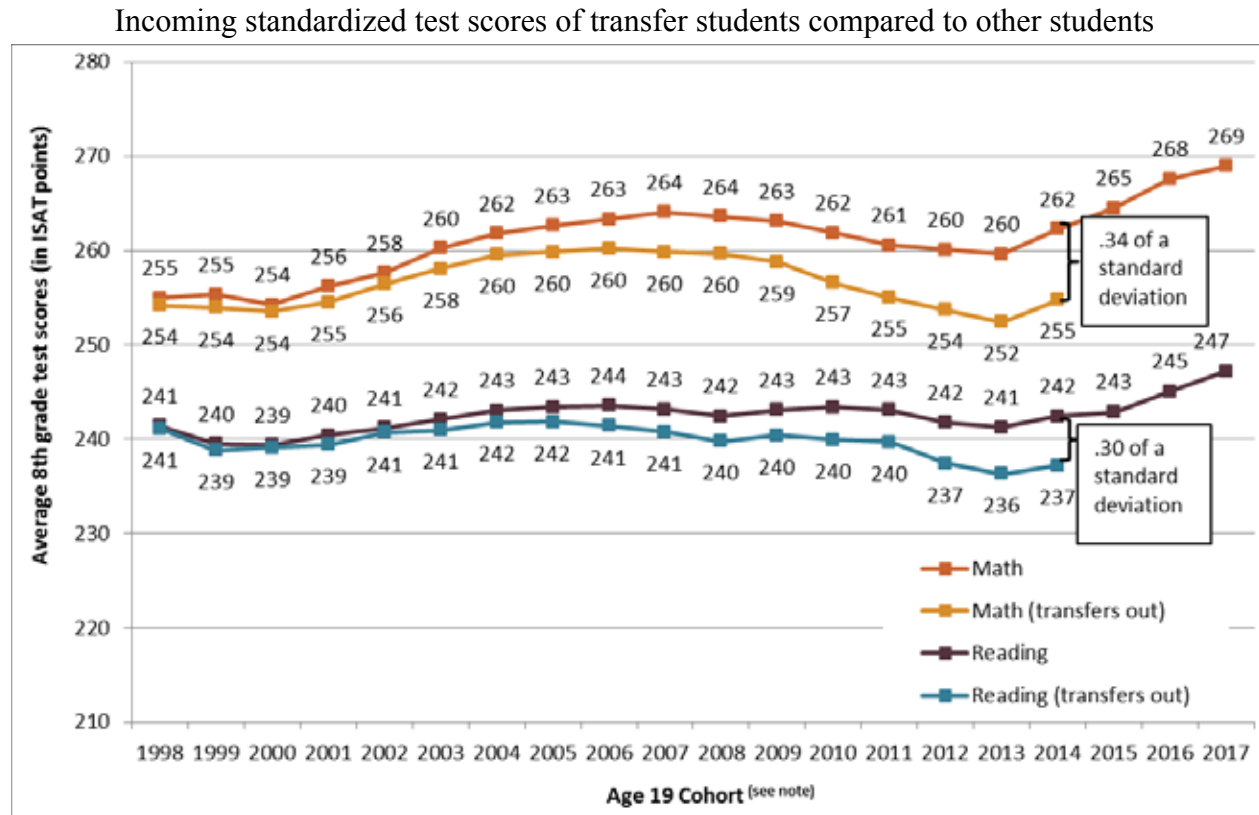
⁶¹ When using cohorts based on grade level, it can also be unclear which cohort these students should be included in. For example, if a student enters the district as an 18 year old tenth-grader, should he be included with the ninth-grade cohort from the year before, or from the three years prior when he might actually have first started high school?

be biased upward if students are coded as transfers when they actually dropped out. If students are coded as a dropout when they actually transferred, the graduation rate is biased downward.⁶²

It is often difficult for schools to determine what happened to their students who are no longer attending classes and to accurately record their reasons for leaving. When graduation rates are used for accountability purposes, there could be pressure to falsely record students whose status is unknown as transfers. There also could be pressure put on students with low achievement to transfer out of the school or district. Either of these occurring to a great extent over time could lead to an artificial increase in graduation rates. There is evidence that is consistent with this concern; students coded as transfer students have been increasingly lower achieving than students who remain in CPS to be counted in the graduation rates. In the 1990s, students coded as transferring out of CPS had similar test scores to other students (see Figure B.1). Since the early 2000s, transfer students, on average, have had lower scores than other students, and the gap has grown over time. Transfer students first start to look different from the general population in the cohorts of students subject to the new graduation requirements and the promotion standards. It is possible that students who struggled with the new requirements, or who entered high school very old-for-grade, made decisions to transfer to schools with less stringent requirements—the requirements for an Illinois diploma were much less rigorous than in CPS. It is also possible that schools miscoded low-achieving dropouts as transferring out of the district, or encouraged these students to leave. Another explanation is that the improvements in achievement in high school performance may be occurring to a lesser degree among highly mobile students. Regardless, students who are coded as transferring out of CPS are increasingly dissimilar from their peers who do not get coded as transfers.

⁶² There are many factors that can affect how students' status is coded, and these factors can change over time leading to biased estimates of improvement in graduation rates. Besides idiosyncratic decisions made by school clerks, a district may change its policies or procedures for recording student outcomes. For example, in 2007, CPS adopted a new data system that changed the codes clerks could use for recording student outcomes. Immediately following the implementation of this data system, a greater number of students were coded as transfers and fewer were coded as dropouts than in the years prior to the new system. However, we do not know which data system more accurately coded these students. There are also broader policy changes that can affect how students' outcomes are recorded. For example, the city of Chicago enacted a policy in 2004 requiring all dropouts to sign a statement before withdrawing from school stating that they understood the consequences of dropping out on their chances for future economic and social success. This may have led clerks to delay in recording students as being no longer enrolled in school, even if they were not attending classes.

Figure B.1: Students Coded as Transferring Out of the District Are Increasingly More Lower-Achieving than Their Peers



Note: Incoming test scores are determined in the year the student first entered ninth grade. For most students, this is when they are 14 years old. We use the years when students were 19 years old for the axis labels to be consistent with the figures showing graduation rates—the cohorts are the same.

Because it is possible for dropout students to be “hidden” as transfer students, it has been recommended that schools and districts meet verification requirements in order for students to be counted as transfers out of the district.⁶³ Verification includes confirming that the student has enrolled in another school, which is usually done through receipt of a transcript request, and verifying that the receiving school grants regular diplomas. Counting unverified student transfers as dropouts provides a substantial incentive for schools to obtain valid records of transfers. However, there are financial costs associated with verification, and verification itself can reduce the accuracy of graduation statistics and introduce bias. Schools that have the greatest demand for verification of transfers—those with large numbers of mobile students—may not be able to put their limited resources into data management. They may be less capable of carrying out verification if the administrative staff is overly taxed or lacks good organizational skills. There can be declines in transfer verification when schools get new principals or a clerk who does not realize how important verification is for their schools’ appearance on accountability measures. Likewise, verification rates can be lower in new schools than in established schools due to lack of experience. Out-of-country transfer verification may not always be possible, and schools

⁶³ U.S. Department of Education (2005).

serving large numbers of students from immigrant families can feel that verification requirements result in unfair statistics. In CPS, there is a period of time by which student transfers must be verified or the transfer is automatically considered to be unverified, generally July 1 of the year the student left the district. Verification can sometimes come too late— valid transfers are counted as dropouts in school records, even if the receiving school sends a request for a transcript in the fall. In fact, CPS counts many students as dropouts simply because their transfers have been verified after the summer deadline.

Requiring transfer verification can deflate graduation rates and potentially reduce their accuracy. Not requiring verification could inflate graduation rates and potentially allow schools or districts to under-report dropouts, leading to increasingly biased statistics. Because CPS uses its graduation rates for accountability purposes, they need to count unverified transfers as non-graduates in their graduation rate calculations. However, this practice produces a graduation rate that is lower than the true graduation rate. In contrast to CPS's need for school accountability, in this report we seek to calculate rates that not only contain the least amount of bias but also are comparable over time. We examined the potential bias both in the *level* of the graduation rates and in the estimate of the *trends* in rates.

Potential bias in the level of the graduation rates due to unverified transfers.

Figure B.2 shows how the graduation rate is affected by removing all transfer students from the denominator, counting all transfer students as dropouts, or removing only verified transfers and counting unverified transfers as dropouts. Using data on transfer verification (which is only consistently available for the 2 most recent cohorts), we estimate that the *rates* in Figure B.2 may be, at most, overestimated by about 5 percentage points due to uncertainty about the outcomes of transfer students. At the same time, counting all of the unverified transfers as dropouts would underestimate the graduation rate, potentially also by about 5 percentage points. Therefore, we conducted additional analyses to determine which likely produced the more accurate rate—counting unverified students as dropouts or counting them as true transfer students.

To determine which produced more bias—counting unverified students as dropouts or as transfer students—we compared the characteristics of students coded as unverified transfers to students who were verified transfer students, and to students who were dropouts. We found that in terms of average age, on-track rate, neighborhood poverty, and test scores, unverified transfers were in-between verified transfers and dropouts (see Table B.1). This is consistent with the likely scenario that some of these students are dropouts, while some of them are true transfer students. On average, their characteristics were more closely aligned to those of verified transfers than to dropouts. This suggests more of them are probably transfer students than dropouts; counting all unverified transfers as dropouts likely biases the estimate of graduation rates downward more than counting verified transfers as transfer students biases it upward. Therefore, one reason we count unverified transfers as transfer students—and remove them from the graduation rate calculations—is we believe this produces more accurate rates than statistics that count them as dropouts.

We also count unverified transfers as transfers for our statistics out of a need for consistency over time. Data on transfer verification in CPS are not consistent over time and are not available at all for some years. Therefore, we cannot count unverified transfers as dropouts over time and

have rates that are comparable. Thus, our calculations of graduation rates are likely biased upward by about 2-3 percentage points based on this decision rule—the true rate lies between the lower and upper bounds represented in Figure B.2.

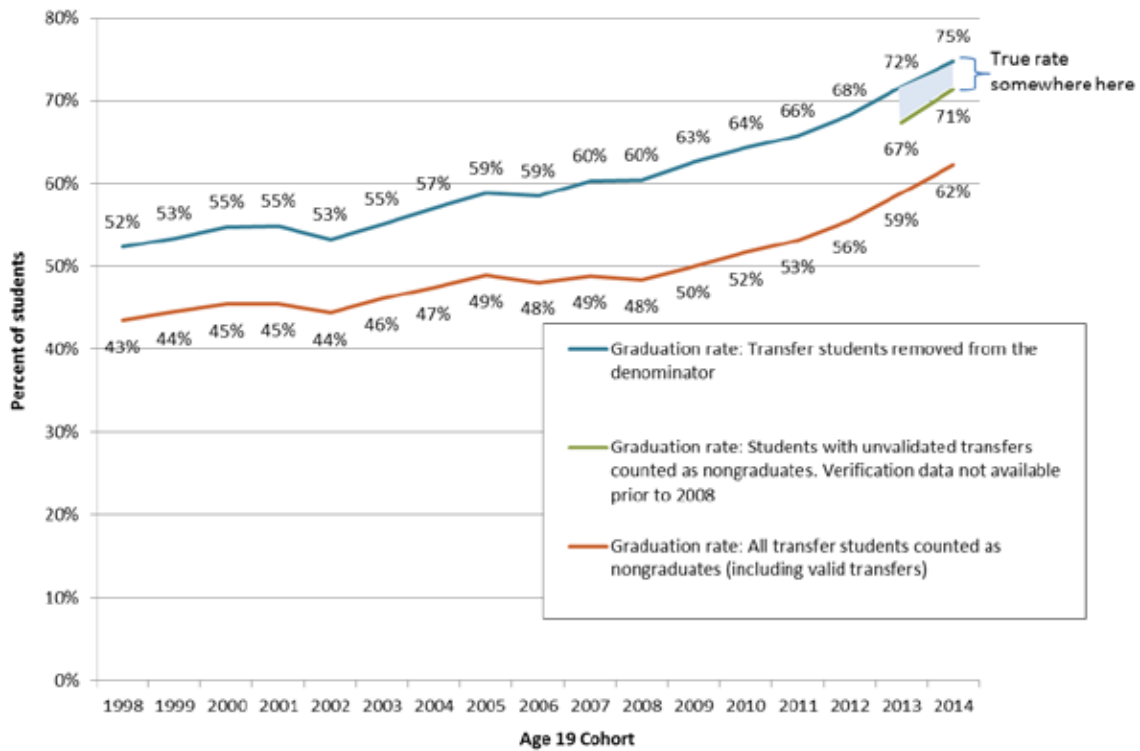
Potential bias in estimates of the trends in graduation rates due to unverified transfers.

While there is not reliable data available over time on transfer verification, we can gauge the extent to which changes in transfer rates could have affected the estimate of graduation rate trends by keeping all transfer students in the graduation rate statistic and counting them all as non-graduates—whether their transfer was verified or not. This produces a statistic that is known to be a substantial underestimate of the true graduation rate for any given year, but one that is not affected by decisions about who to count as a verified or unverified transfer, or who to count as a transfer student versus a dropout. As shown in Figure B.2, the trends in graduation rates that use the more conservative measure that counts all transfer students as non-graduates are generally parallel to those that exclude them from the statistic, with the exception of a widening that occurs with the 2007 cohort of 2 percentage points, and a few other years where the growth differed by as much as 1 percentage point. After the split in 2007, the trends are again fairly parallel. The district instituted a new student record system in 2007, with a completely different set of codes for recording students' status. The changes in record-keeping procedures that occurred at this time might have led to the increase in the number of students counted as transfers.

Most of the increases in graduation rates over the 16 year period described in this report could not have resulted from miscoding numbers of dropouts as transfers at higher rates; there is still a 19 percentage point gain in graduation rates using the most conservative estimate, compared to a 22 percentage point increase using the rates shown in this report. There may still be inaccurate coding in all years, but the extent to which miscoding dropouts as transfer students has *increased* over time and could have affected the *trends* in graduation rates is at most about 3 percentage points.

Figure B.2: Graduation Rates Show Substantial Improvement, Even if All Transfer Students Are Counted as Non-Graduates

Percentage of students who graduated with a regular diploma by the time they were 19



Note: Students with alternative diplomas are counted as non-graduates in each of these trends. Institutionalized, incarcerated, or deceased students are removed from the statistics. Transfer verification data are only available from 2008 onward.

Table B.1: The Characteristics of Unverified Transfers Fall Somewhere between Dropouts and Verified Transfers

Characteristics of unverified transfers compared to dropouts and students with verified transfers among cohorts of 19 year olds in 2013 and 2014

Characteristic	Dropouts	Unverified transfers	Verified transfers
Number of students	6,580	2,907	6,344
Average ninth-grade GPA	1.12	1.38	1.53
Average ninth-grade attendance rate	67%	73%	77%
Percent attended a charter school in ninth grade	17%	19%	6%
Percent on-track in ninth grade	26%	39%	46%
Percent male	59%	56%	57%
Percent African American	61%	50%	49%
Percent Latino	32%	39%	40%
Percent old or very old for grade	36%	28%	32%
Average percent of families living below the poverty line in student's census block	25%	22%	22%
Average percent of adult males in student's census block who are not working	31%	28%	27%
Average incoming math score (ISAT points)	250.0	252.8	253.6
Average incoming reading score (ISAT points)	234.2	236.6	236.7

Who should be counted as a graduate?

Diplomas from alternative schools may not be equivalent to regular diplomas

Determining who counts as a graduate is typically less complicated than determining who should be included and excluded from a cohort. However, graduation rates calculations can be affected by how students who do not earn a traditional high school diploma are counted. CPS offers alternative pathways for students who have already dropped out or, given their age and the number of credits they have accumulated, are very unlikely to graduate from a regular high school. These alternative schools and programs offer students more flexible options for earning credits and eventually graduating, including part-time, evening, and online learning options. The Illinois State Board of Education and CPS count students who graduate from these programs as graduates. This makes sense from the perspective of advocates for dropouts; if students who graduate from alternative schools are counted as dropouts, there is no incentive for the district to get students who drop out to enroll in alternative schools. There is also no incentive for high school principals to find alternative school slots for their students who are likely to drop out anyway. On the other hand, it is not clear that the quality of instruction and requirements to earn credits are equivalent to a traditional program of study. Because of this uncertainty, we do not include students who receive diplomas from alternative schools as graduates when measuring trends. Whether or not this biases the rates downward depends on people's perspective about what an alternative diploma represents. As shown in Figure 3 in Chapter 1, there has been a slight increase in the percentage of students earning alternative diplomas over time, from less than 1 percent of students to about 3 percent of students. The district's decision to include these students as graduates slightly influenced the positive trends in graduation rates that they produce, but their contribution was small. Improvements in graduation rates are large, even when these students are counted as dropouts.

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