

SEVEN TRENDS

The Transformation of the Teaching Force

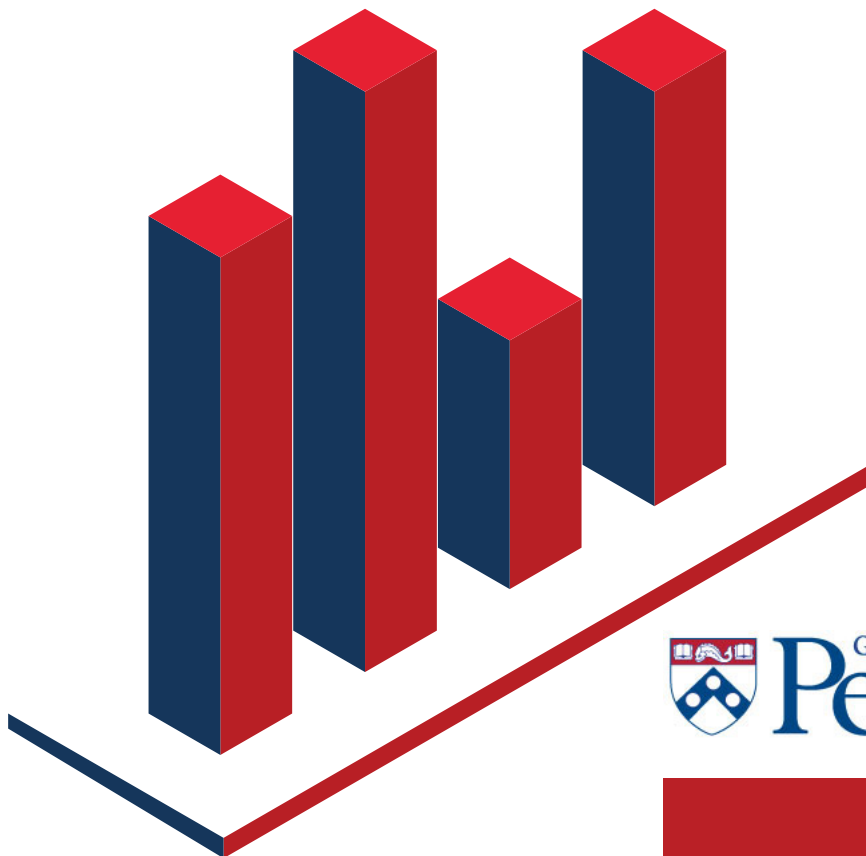
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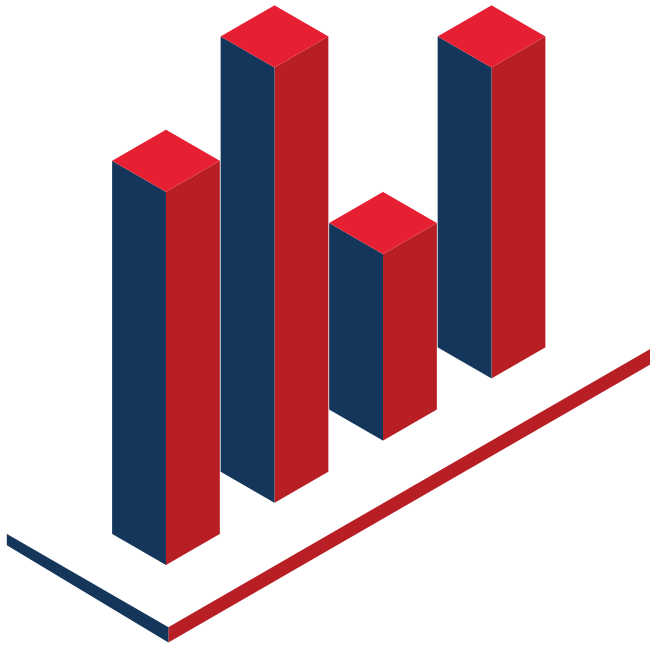
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Seven Trends: The Transformation of the Teaching Force

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Introduction

Has the elementary and secondary teaching force changed in recent years? And, if so, how? Have the types and kinds of individuals going into teaching changed? Have the demographic characteristics of those working in classrooms altered? To answer these questions we embarked on an exploratory research project to try to discover what trends and changes have, or have not, occurred in the teaching force over the past three decades. We were surprised by what we found. We discovered that the teaching force has been, and is, greatly changing; yet, even the most dramatic trends appear to have been little noticed by researchers, policy makers, and the public.

To explore these questions, we used the largest and most comprehensive source of data on teachers available—the Schools and Staffing Survey (SASS) and its supplement, the Teacher Follow-Up Survey (TFS). These data are collected by the National Center for Education Statistics (NCES), the statistical arm of the U.S. Department of Education (for information on SASS, see NCES, 2013). NCES has administered eight cycles of this survey over a 29-year period—1987-88, 1990-91, 1993-94, 1999-2000, 2003-04, 2007-08, 2011-12, and 2015-16. The most recent cycle, administered in 2015-16, was renamed the National Teacher Principal Survey (NTPS). In each cycle, NCES administers questionnaires to a nationally representative sample of 40,000 to 50,000 teachers, 9,000 to 11,000 school-level administrators, and about 5,000 district-level officials, collecting an unusually rich array of information on teachers, their students, and their schools. We decided to take advantage of both the depth and duration of these data to explore what changes have taken place in the teaching force and teaching occupation over the

three decades from 1987 to 2016. Below, we summarize seven of the most prominent trends and changes; we found the teaching force to be:

1. Larger
2. Grayer
3. Greener
4. More Female
5. More Diverse, by Race-Ethnicity
6. Consistent in Academic Ability
7. Unstable

For each of the trends, two large questions arise:

1. Why? What are the reasons for and sources of the trend?
2. So what? What difference does it make? What are the implications and consequences of the trend?

We will offer some possible answers to these questions. But our intent here is not to arrive at closure; that would require far more extensive analyses. Our work here is largely exploratory and suggestive, rather than explanatory and evaluative. In short, we ask more questions than we are able to answer. We plan to undertake further research to rectify that.

In an earlier edition of this report, released in April 2014, our analyses went up to 2012—the most current data then available. With the recent release of the 2015-16 National Teacher Principal Survey (NTPS) data, we have been able to update almost all of our findings for this new edition of our report.

Trend 1: Larger

The teaching force has ballooned in size. The Census Bureau indicates that PreK-12 teachers form one of the largest occupational groups in the nation (Bureau of Labor Statistics, 2018), and the teaching force is growing even larger. Growth in the numbers of students and teachers is not new. The numbers of both students and teachers grew throughout the 20th century, and the rate of growth for both groups began to soar in the late 1940s with the post-World War II baby boom and the emergence of the comprehensive high school. Student enrollment peaked by 1970 and then declined until the mid-1980s. During this period the numbers of teachers also peaked, and then leveled off. In the mid-1980s, elementary and secondary student enrollment again began to grow. Since then, the teaching force has also been increasing in size (see Figure 1).

The rate of these increases has not matched those of the baby boom years—with one large difference. In recent decades, the rate of increase for teachers has far outpaced the rate of increase for students—that is, the number of teachers has been going up far faster than the number of students. As the top of Figure 2 shows, from 1987-88 to 2015-16 total K-12 student

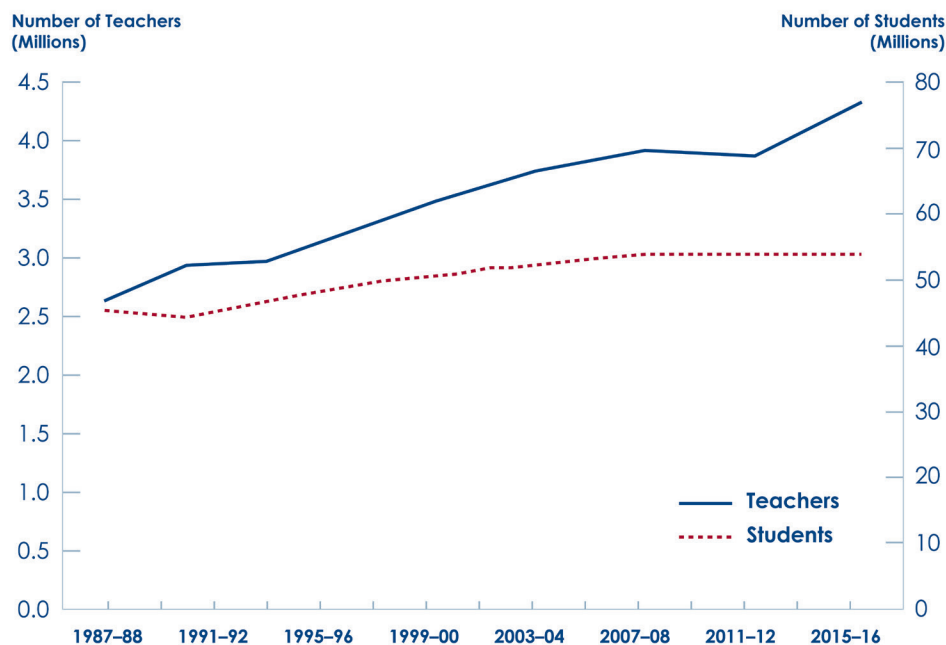
enrollment in the nation's schools (public, private, and charter combined) went up by 20 percent. During the same period the teaching force employed in schools increased at over three times that rate, by 64 percent. This resulted in a sharp decrease in the overall pupil-teacher ratio in schools.

As illustrated in Figure 1, during the economic downturn between 2008 and 2012, growth in the teaching force leveled off. Between 2007-08 and 2011-12, while the student population slightly increased (by less than 1 percent), the teaching force slightly decreased (by about 1 percent). It is unclear how much of this decrease in teachers was due to layoffs or to hiring freezes combined with attrition. After 2012 growth picked up again.

What accounts for the ballooning of the teaching force between the late 1980s and 2016?

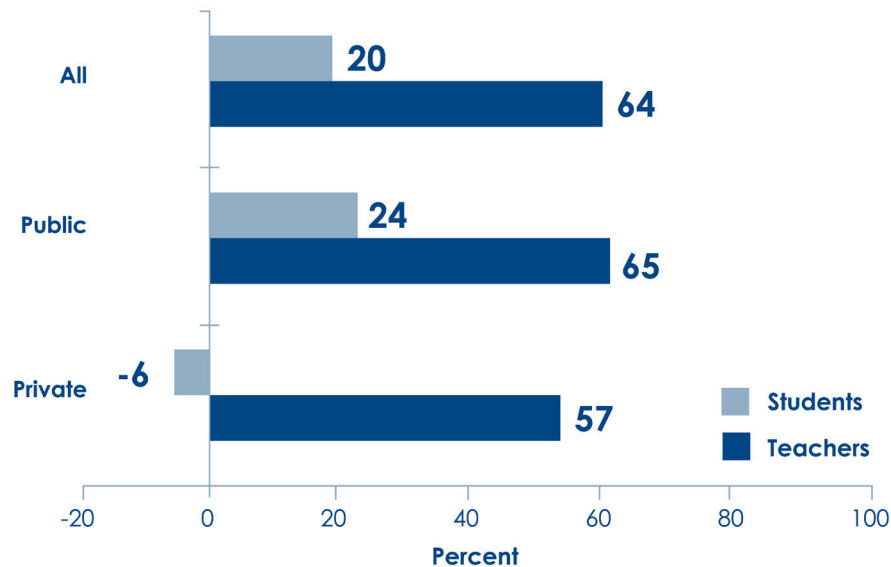
Interestingly, the number of teachers employed in private schools has increased at a faster rate than in public schools relative to the student population (Figure 2). But, surprisingly, while the total number of teachers in private schools has increased, the number of students in private schools has decreased. This also varies by type of private school. The three decades from 1987

Figure 1
Trends in the Numbers of Elementary and Secondary School Teachers and Students,
1987-88 to 2015-16



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Figure 2
Percent Increase in Students and Teachers, by School Type, from 1987–88 to 2015–16



to 2016 saw a 9 percent increase in the number of teachers employed in Catholic schools, while there was a 26 percent decrease in the number of Catholic schools and a 33 percent decrease in the total number of students enrolled in them. On the other hand, there were increases in the total number of schools, students, and teachers in the non-Catholic religious private school sector and in the non-sectarian private school sector. The overall result has been a sharp decrease in the average pupil-teacher ratio and average class sizes in private schools, which were already lower than in public schools. However, this increase in private sector teachers and reduction in the student-to-teacher load in private schools does not account for much of the overall ballooning because private schools account only for a small portion of the student population (about 9 percent) and of the teaching force (about 11 percent).

Growth in the number of teachers was also not even among public schools. The number of students from poor families, and hence who qualify for the National School Lunch Program (NSLP), has dramatically increased over the past three decades. It is unclear if this is due to increases in poverty, increases in poverty among families with school age children, or to changes in either student applications or the eligibility requirements for the NSLP. But, the result is that there have been large increases in the number

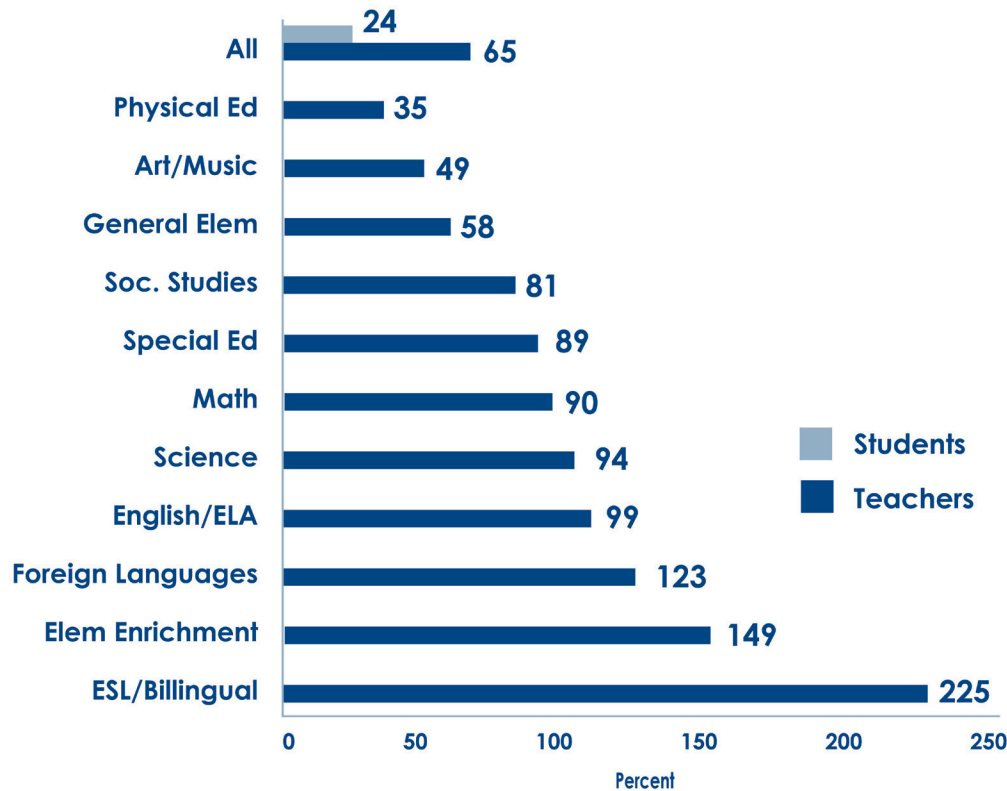
of high-poverty public schools and in the numbers of students and teachers in such schools. On the other hand, there have been large decreases in the number of lower-poverty public schools and in the numbers of students and teachers in such schools. Over half of the total increase in the number of teachers in public schools took place in high-poverty schools, (those in which three-quarters or more of the students were eligible for the lunch program). This group went from 10 percent of all public schools in 1987-88 to a third of all public schools by 2015-16. Charter schools have also dramatically grown in number over the past couple of decades, but they account for only a small portion of the ballooning of the teaching force because they represent a tiny segment of schools (about 5.2 percent in 2015-16) and of the teaching force (about 5.1 percent).

Another possible explanation for the ballooning is that a reduction in public school teachers' workloads—class sizes, hours worked, or classes taught per day—necessitated an increase in the number of teachers employed. For instance, some states, such as California, implemented class size reduction reforms to great fanfare—leading to a demand for more teachers.

On close examination, this explanation does account for part of the ballooning of teachers, but not as much as one might expect. Public school elementary-level class size did decrease by 20

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Figure 3
Percent Increase in Public School Students and Teachers by Field, from 1987–88 to 2015–16



percent during this period (late 1980s to 2015-16), from an average of 26.2 to 21.1 students per general elementary school classroom. Accordingly, the number of general elementary school teachers increased, and because elementary teachers comprise the largest field of teaching – almost a third of the entire teaching force – their increase explains about 27 percent of the ballooning in public schools.

However, in contrast to elementary classrooms, typical subject-area teachers at public middle and secondary schools experienced, if anything, increases in their workloads. Average class sizes at these levels went up during this period. The average number of classes taught per day changed little, and, at all grade levels, the average number of instructional hours that teachers work per week slightly increased.

As shown in Figure 3, there have been dramatic increases in the number of public school teachers whose main field was bilingual/English-as-a-second-language (ESL), and whose main assignment was teaching elementary enrichment classes (these

are instructors who teach only one subject, such as art, music, physical education, computer science, or mathematics, to most of the students in a given elementary school).

It is important to also note that these data on percentage increases in fields do not take into account the relative size of fields and can be misinterpreted if a large percentage increase occurs in a small field, or vice versa. In the case of the above two fields of teaching, while each is undergoing dramatic growth, combined they remain a small segment of the teaching force, and hence, their rapid increases together account for only about 14 percent of the increase in public school teachers during this three-decade period.

The data also indicate that a significant source of the ballooning has been the growth of special education, likely linked to changes in the Individuals with Disabilities Education Act, the main federal special education legislation. As Figure 3 shows, the number of public school teachers whose main field was special education increased by 89 percent, compared to

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58 percent for general elementary school teachers. Special education classes average about half the size of typical classes in elementary and secondary schools, and special education is a relatively large field. Hence, the increase in special education teachers alone accounts for about 14 percent of the increase in the public school teaching force.

As the teaching force has grown, it has also experienced large shifts at the middle and secondary levels during this period. Overall, the number of typical subject-area teachers at the middle and secondary school level has increased by 68 percent. But there has also been a large redistribution of these teachers across fields, with some growing far faster than others. Among those growing the slowest from the late 1980s to 2016 were art, music, and physical education. Among those growing the fastest, besides special education, were the core subjects of English/language arts, foreign languages, mathematics, and science. For example, the number of teachers whose main field was English/ELA increased by 99 percent. This is one of the largest fields and comprises a variety of subfields, such as literature, composition, reading, and language arts. The number of teachers whose main field was reading increased by 125 percent during this period.

The number of teachers of mathematics went up by 90 percent. The number of teachers of science went up by 94 percent. Although there are two and a half times as many general elementary teachers as mathematics and science teachers, the increase in math and science teachers accounts for about 18 percent of the overall ballooning in public schools. A major factor in the growth in the number of mathematics and science teachers appears to be changes in high school graduation requirements across the nation. While the number of courses required for graduation went up slightly for English, social studies, and foreign languages, they increased far more for mathematics and science during this period. This change meant that students took more mathematics and science courses. The data show that the number of 9th through 12th grade students enrolled in mathematics went up dramatically, in turn driving the large increase in the employment of teachers qualified in those subjects during this period.

However, we have not yet uncovered all of the reasons for, and sources behind, the ballooning of the teaching force. One possible set of factors behind the ballooning could be ongoing increases in the number and range of programs, courses, and curricula that schools are required to offer, especially at the secondary level. Educational historians tell us that

programmatic expansion has been going on for a century, as schools have continually been asked to take on more and more goals and tasks that were once the responsibility of parents, families, and communities, and as our schools are continually asked to address larger problems of our society and economy (Kirst, 1984). Indeed, it is important to note that the hiring of more math, science, special education, ESL/bilingual, foreign language, reading, and elementary enrichment teachers is simply in response to what the public wants. These are fields that have been in high demand.

Given the broad implications, there are good reasons to investigate the sources of the rapid growth in the teaching force. For instance, the expansion of the teaching force, while perhaps entirely in response to public demand, has not been cost-free, especially considering that teacher salaries are the largest item in school district budgets. How much has ballooning cost the nation for teacher salaries? How have school systems been able to cope with such an increase in their largest budget item, and who has been paying for it? To explore these issues, we have undertaken a preliminary analysis to estimate the increase in aggregate salaries for teachers across the nation due to the ballooning in the number of teachers. Our rough estimate is that in the three decades between 1987-88 and 2015-16 the additional aggregate cost of salaries due to hiring more teachers, beyond what would have been necessary to have kept pace with student enrollment increases, was over 40 billion dollars.

The ballooning of the teaching force also raises related questions regarding the performance and cost-effectiveness of the school system. Economists have long pointed out that, through technological advances, workers in many industries and occupations have become far more productive. A key example is the remarkable increase in agricultural production per farmer over the past century. The opposite appears to be the case for teachers. Decreases in the pupil-teacher ratio suggest that teaching has become increasingly labor intensive.

One key question, of course, is whether there has been a commensurate increase in output and productivity with the increase in teacher inputs. More teachers per student does not necessarily mean decreased teacher productivity. For instance, a portion of the ballooning has been accounted for by the increased demand for, and employment of, bilingual/English-as-a-second-language and special education teachers. These fields appear to require a more intensive teaching process and more teachers

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per student; hence, fewer students per teacher in these fields does not necessarily mean a decline in output of teachers. Moreover, it is important to note that teaching is not the only occupation in which the number of practitioners has been increasing at a faster rate than the client base. For example, data from the Bureau of Labor Statistics show that the number of nurses, dentists, and pharmacists have all increased in recent decades at a faster rate than the populations they serve. It is unclear why this is, but such increases do not necessarily mean that nurses, pharmacists and dentists are less productive than in the past.

Another implication of the ballooning is for the much-heralded mathematics and science teacher shortage. We have explored this issue in depth elsewhere (see Ingersoll, 2001; Ingersoll & Perda, 2010; Ingersoll & May, 2012). Among other findings, our data analyses show that, contrary to conventional wisdom, the growth in the new supply and employment of qualified mathematics and science teachers has not only more than kept pace with increases in mathematics and science student enrollments, but also with mathematics and science teacher retirement increases—a point we address in Trend 2.

Our data analyses also reveal some common misunderstandings by commentators on differing sides of the ideological and political spectrum. For instance, some liberal-left commentators, such as Nobel Laureate economist Paul Krugman, argued that the economic recession could have been kick-started into recovery if those teachers who were laid off beginning in 2008 had simply been rehired (Krugman, 2012). However, this view overlooks the prior ballooning of the teaching force. Our data show that the decline in the teaching force between 2007-08 and 2011-12 was very small compared to the dramatic ballooning the teaching force experienced in the preceding decades. Our data show the teaching force increased by about 1.3 million from 1987-88 to 2007-08, but only declined by about 45,000 teachers between 2007-08 and 2011-12, over half of which were from private schools. In other words, put into a historical context, reductions of the teaching force were neither large nor severe.

On the other side of the political spectrum, some free-market and conservative economists and organizations, such as the Milton Friedman Foundation for Educational Choice, have specifically focused on the ballooning of the teaching force, which they interpret as an example of “bureaucratic bloat” and “negative productivity” in the public sector (e.g., Moore, 2011; Scafidi, 2013). This view cites the

ballooning as evidence for a reduction in teacher productivity—more teachers per students coupled with little change in test scores. The solution this view typically espouses is school choice and privatization, based on the argument that leaner private schools (and charter schools) are more efficient. Private schools, in this view, have fewer administrators, reward excellent teaching, fire low-performing teachers, improve student achievement and, in turn, achieve greater teacher productivity—in other words, they get greater student achievement with fewer teachers.

However, what these critics overlook is the larger ballooning of the teacher force in private schools. Private schools have long had lower pupil-teacher ratios and lower average class sizes than public schools, but as we show in Figure 2, this gap between public and private schools has dramatically grown in recent decades. Indeed, not only has the teaching force grown in private schools as in public schools since the late 1980s, this has happened while the overall number of students in private schools has decreased. In essence, the data show that the aforementioned charges of bloat and inefficiency are perhaps more aptly directed at private schools: Teacher ballooning in private schools has outpaced ballooning in public schools.

Moreover, it is not clear that different decreases in the pupil-teacher student ratio have led to different gains in student achievement between public and private schools. It is true that the data on student achievement have long shown that, overall, students in private schools score higher on math and reading tests. But the data on gains and growth in student achievement in recent decades are mixed. Data from the National Assessment of Educational Progress (NAEP), for example, show little public-private difference in gains in reading and math scores at the elementary and middle school levels, when the teacher increases occurred. On the other hand, the data show better gains in some subjects in private schools at the high school level. But these high school differences are quite small, despite the higher rates of ballooning in the private sector (U.S. Department of Education, 2017)

The ballooning of the teaching force is a dramatic trend, and it is no surprise that a variety of commentators have begun to notice and offer explanations for it. However, the reasons for, and implications of, this dramatic growth are still unclear. We hope to address these questions with further research.

Trend 2: Grayer

The teaching force has been getting older. We have often heard about this trend because of its link to teacher shortages. Since the mid-1980s, numerous highly publicized reports have warned of a coming educational crisis caused by severe teacher shortages in elementary and secondary schools (e.g., National Commission on Excellence in Education, 1983; National Academy of Sciences, 1987; National Commission on Teaching and America's Future, 1996, 1997; John Glenn Commission on Mathematics and Science Teaching for the 21st Century, 2000, National Research Council, 2002, and National Academy of Sciences, 2007). These reports predicted a dramatic increase in the demand for new teachers, primarily as a result of two converging demographic trends—increasing student enrollments and increasing teacher retirements due to a “graying” teaching force. Shortfalls of teachers, the argument surmised, would force many school systems to resort to lowering standards to fill teaching openings, inevitably resulting in high numbers of underqualified teachers and low school performance.

Our data confirm this demographic trend: the teaching force has gotten older, and teacher

retirements have steadily increased. But our analyses also show that this trend is largely over. As Figure 4 shows, in 1987-88 the age distribution of public school teachers was shaped like a tall peak. The modal, or most common, age was 41. As the years went by this group continued to age, and by 2007-08 the modal age of public school teachers rose to 55. However, by 2015-16 the most common age of public school teachers had decreased and also spread out – with the modal age ranging from the mid-30s to the mid-40s.

Likewise, the number of public school teachers 50 years or older increased, from less than 500,000 in 1988 to a peak of 1,174,000 in 2008. However, by 2015-16 the number of public school teachers 50 or older had decreased to about 1,113,000 (see Figure 5 for percentage changes).

What are the implications of this trend?

The aging of the teaching force has had large cost implications for both school budgets and for state pension systems—an issue that has received much media and policy attention in recent decades. Veteran teachers earn higher salaries, which, in turn, can strain school and district budgets. Increases in the number of retirees mean larger outlays from state pension plans.

Figure 4
Age of Public School Teachers 1987–88 and 2015–16

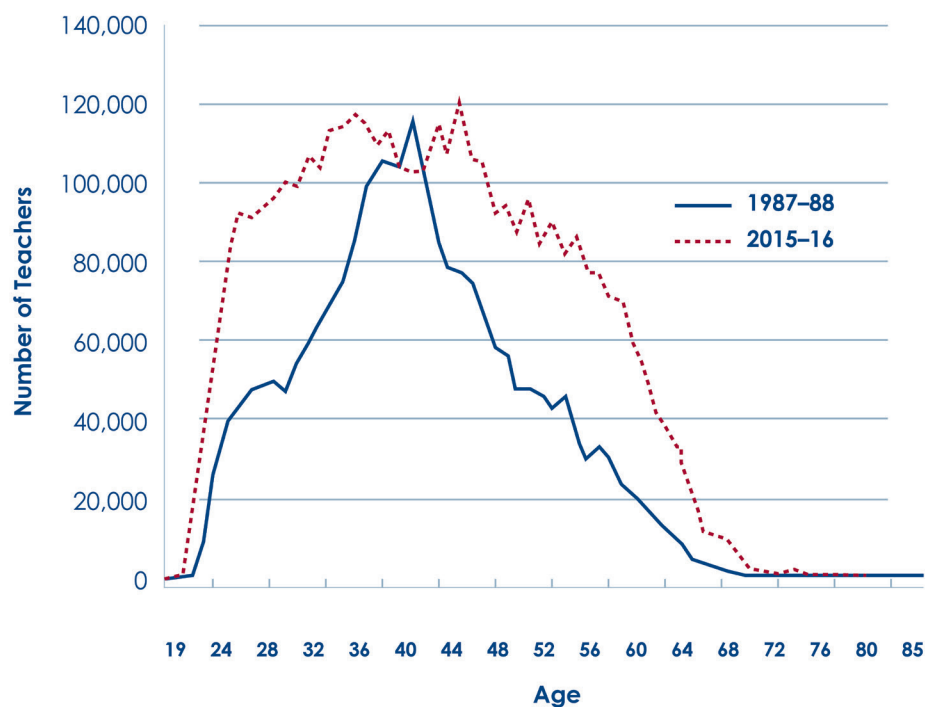
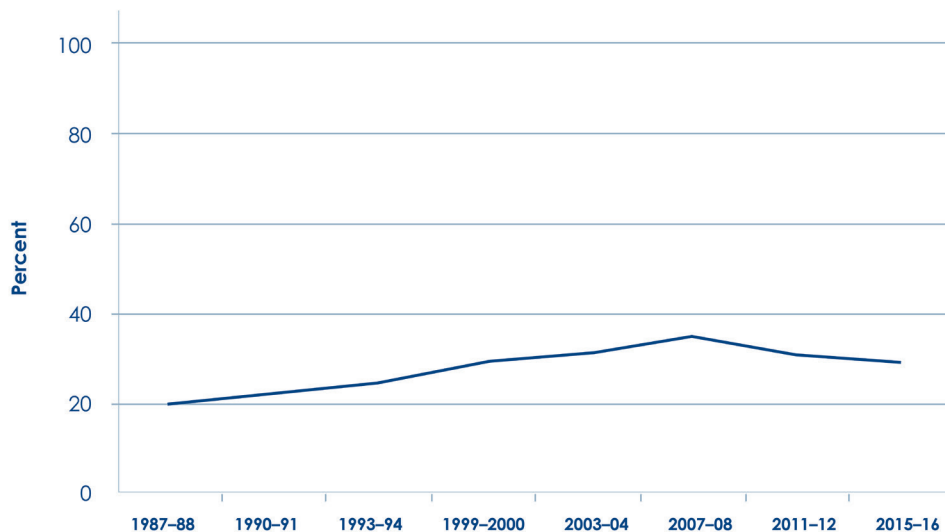


Figure 5
Trends in the Percent of Public School Teachers Age 50 and Over: 1987–88 to 2015–16



But in discussions of the dire future for pension systems, another factor has been underemphasized; if schools replace retirees with new teachers, who earn lower salaries and who also pay into state pension plans, these additional costs could be lessened. As we discuss in Trend 3, not only have retirees been replaced with newcomers, but the flow of newcomers has become a flood.

Another implication of aging is its impact on the supply of teachers. Conventional wisdom has long held that retirements are a major factor behind teacher shortages. But teacher retirements have always represented only a small portion of all of those leaving teaching—less than a third in recent years. And, if you look at all departures of teachers from schools (both those moving between schools and those leaving teaching altogether), retirement is only about 14 percent of the total outflow. In our research on the math and science teacher shortage, as mentioned above, we have found that, contrary to the conventional wisdom, the new supply of qualified math and science teachers has been more than sufficient to cover student enrollment increases and teacher retirement increases in these subjects. In contrast, the main, but under-recognized, source of mathematics and science teacher staffing problems is pre-retirement voluntary turnover (see Ingersoll, 2001; Ingersoll & Perda, 2010; Ingersoll & May, 2012), an issue to which we return in Trend 7.

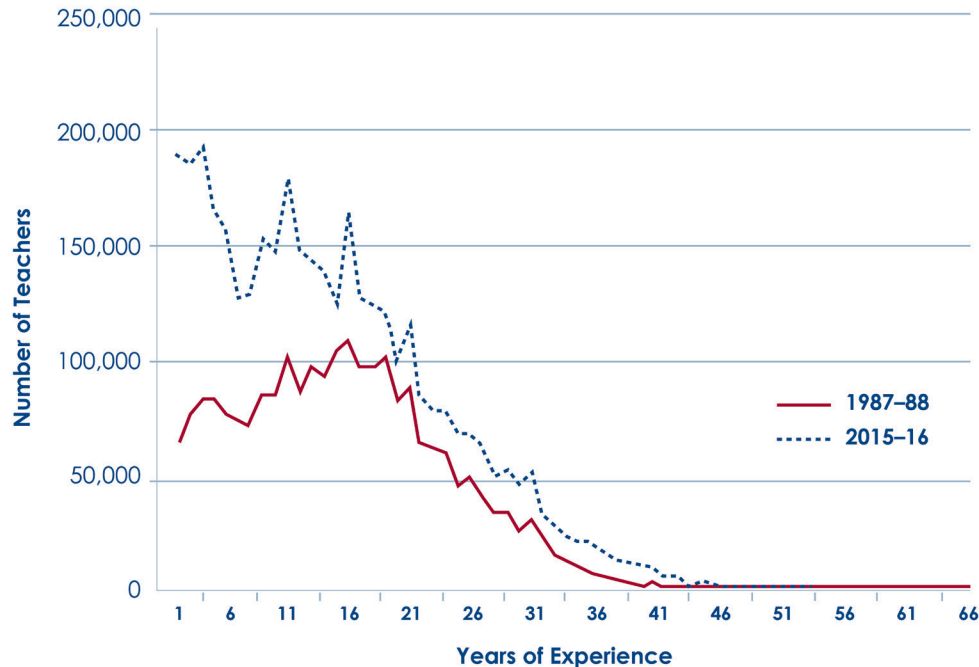
Trend 3: Greener

Graying is not the only change in the age and experience of the teaching force. Another opposite and unrecognized trend has occurred simultaneously. As Figure 4 shows, by 2015–16, the public school teacher age distribution had spread out, with multiple peaks. As the proportion of older, veteran teachers has increased, so has the proportion of beginning teachers. The increase in beginning teachers is largely driven by the ballooning trend, that is, by the huge increase in new hires.

Most of these new hires are young, recent college graduates; however, a significant number are older but inexperienced beginning teachers. For instance, in 2015–16 about 42 percent of new hires in public schools were age 29 or older, and about 19 percent were over 40—the phenomenon often referred to as mid-career switching. This has been fostered by recruitment programs such as Troops to Teachers. But mid-career switching into teaching is neither new nor an upward trend. Indeed, despite an increase in the number of older new hires, the proportion of new hires age 29 or older is little different from that in the late 1980s.

Regardless of their age, these many new hires have resulted in a third trend—a dramatic increase in

Figure 6
Teaching Experience of Public School Teachers, 1987–88 and 2015–16



the number of teachers who are beginners—which we have labeled the greening of the teaching force. This trend is illustrated by the distribution of public school teachers by their years of teaching experience. In 1987-88, the modal, or most common, public school teacher had 15 years of teaching experience under his or her belt, and the shape of the distribution was a single peak, as shown in Figure 6. By 2007-08, the modal teacher was not a gray-haired veteran; he or she was a beginner in his or her first year of teaching. With the advent of the economic downturn beginning in 2007-08 and the subsequent decrease in hiring, which was accompanied by layoffs—usually of beginners—this greening of the teaching force slowed down. Hence, by 2011-12, the modal teacher was someone in his or her fifth year. However, with the pickup in hiring, by 2015-16, the modal public school teacher was again a beginner—in their first three years (Figure 6).

There are, of course, still large numbers of veteran teachers; in 2015-16 about a quarter of all school teachers had 20 years or more of teaching experience. But it is useful to recognize that the percentages on greening included above do not take into account the ballooning of the teaching force. Because the teaching force has dramatically grown, numerically

there are far more beginners than before. For example, in 1987-88, there were about 65,000 first-year public school teachers; by 2015-16, there were about 191,000 first-year public school teachers. Similarly, in 1987-88, approximately 810,000 public school teachers (about 35 percent of all public school teachers) had 10 or fewer years of teaching experience; in 2015-16 there were over 1.6 million public school teachers (about 43 percent of the public teaching force) with 10 or fewer years of experience.

What are the implications of this trend?

New teachers can be a source of fresh ideas and energy, and it can be beneficial to have new faculty coming into schools. On the other hand, having an increasingly larger number of beginners, along with an increasingly smaller number of veterans, in a school could also have a negative impact. Being taught by more experienced teachers, for example, can make a positive difference for students' academic achievement. A growing number of empirical studies document what is common sense among those who have taught—that teachers' effectiveness at improving their students' test scores increases significantly through their first several years on the job (e.g., Henry, Fortner,

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& Bastian, 2012; Kane, Rockoff, & Staiger, 2006). Beyond academic instruction, as they collect more experience, teachers also have more opportunity to develop many other attributes crucial to teaching, such as how to deal with student behavior problems, how to teach students with diverse backgrounds and abilities, how to work and communicate with parents, how to best promote good work habits in students, and how to nurture students' self-esteem. Having sufficient numbers of veteran teachers in a school can also make a positive difference for beginning teachers. A solid body of empirical research documents that support, including mentoring by veteran teachers, has a positive effect on beginning teachers' quality of instruction, retention, and capacity to improve their students' academic achievement (Ingersoll & Strong, 2011).

Greening also has large financial implications—for several reasons. First, greening has implications for overall teacher salary costs. A teaching force with an increasingly large portion of beginners, at the low end of the pay scale, is less expensive, and this could ameliorate some of the increased payroll costs of the ballooning trend mentioned above. In 2015-16, the average starting salary for public school teachers with a college degree and no teaching experience was about \$38,800; while that same year the average salary for veteran public school teachers, with over 15 years of experience and a master's degree, was about \$66,500.

Second, greening has implications for pension systems. Greening may defray some of the increased pension costs resulting from the graying trend. Economic analysts have been arguing that there has been an alarming decrease in the ratio of new employees who pay into pension systems and Social Security, compared to retired employees who withdraw from pension systems and Social Security. This imbalance does not appear to be the case for teaching, which is one of the largest occupational groups in the nation. As Figures 4 and 6 illustrate, both the proportion and the numbers of younger and less experienced teachers have increased, not decreased.

Moreover, as we will show in Trend 7, early attrition has remained high among this growing number of beginners, meaning that a significant number will never withdraw funds from their school system's pension plan. In some states it can take 10 years for a teacher to become fully vested, and hence eligible, upon leaving a school system, to receive any funds contributed by their employers to their pension plan. In addition, school system pension plans are sometimes backloaded: pension payout levels do not increase evenly with

each year of increased classroom experience. Rather, payouts are often relatively small until a teacher has accumulated two or three decades of classroom experience, after which they suddenly jump. Relatively few teachers remain in such systems long enough to reap these enhanced benefits.

In sum, greening (along with high attrition) means more of the teaching force is less expensive and more teachers are paying into pension plans, while less of them will fully, or ever, withdraw from pension systems.

Trend 4: More Female

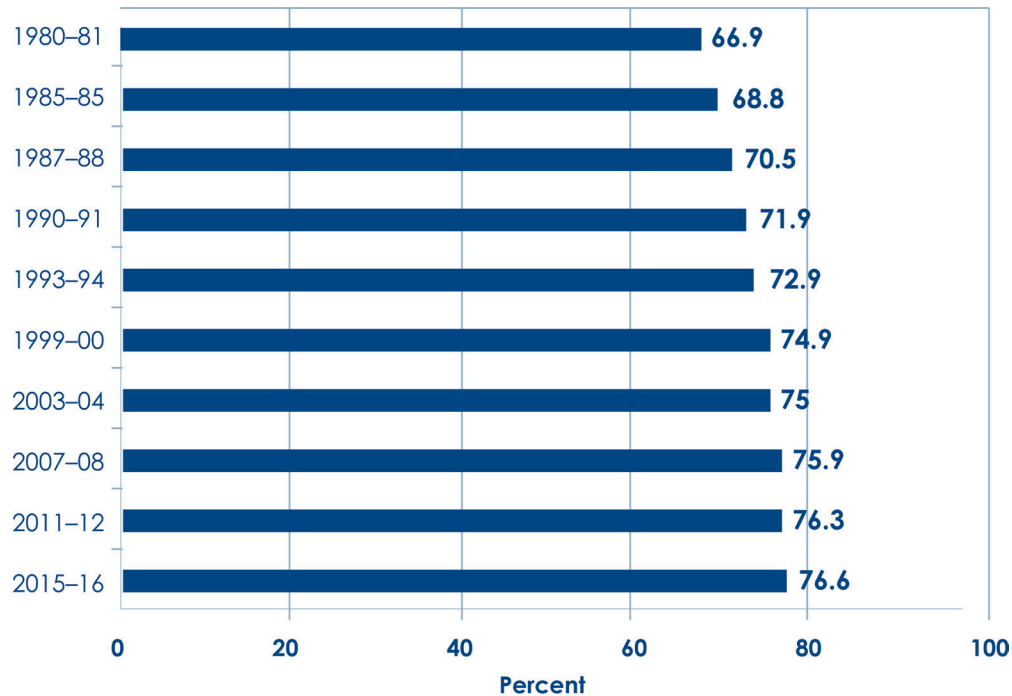
Historically, school teaching has been a predominantly female occupation. And, in recent decades, the teaching force has become even more female. At first, this finding may seem odd. Over the past several decades, many occupations and professions that traditionally have been predominantly male have opened up to women. For instance, data from the Bureau of Labor Statistics (2018) show that in 1972, only 10 percent of physicians, 4 percent of lawyers, 4 percent of architects, and 13 percent of pharmacists were female; by 2018, these proportions had risen to 40 percent (physicians), 37 percent (lawyers), 29 percent (architects), and 58 percent (pharmacists).

With career and employment alternatives increasingly available, one might think that fewer women would enter occupations and professions that traditionally have been predominantly female. This has not happened for teaching. Both the number of women entering teaching and the proportion of teachers who are female have gone up. The SASS data, along with other NCES data, show that since the early 1980s there has been a slow but steady increase in the proportion of public school teachers who are female, from 67 percent in 1980-81 to over 76 percent in 2015-16 (see Figure 7). It is unclear why this has happened.

The change in the male-to-female ratio in teaching is not due to a decline in males entering the occupation. The number of male teachers employed in public schools has also grown, by 31 percent, which is also faster than the rate of increase of the student population. But the number of females in teaching has increased at over twice that rate.

One reason could be a variant of the previously mentioned increasing-career-opportunities hypothesis—females have other employment opportunities

Figure 7
Trends in the Percent Female Public School Teachers: 1980–81 to 2015–16



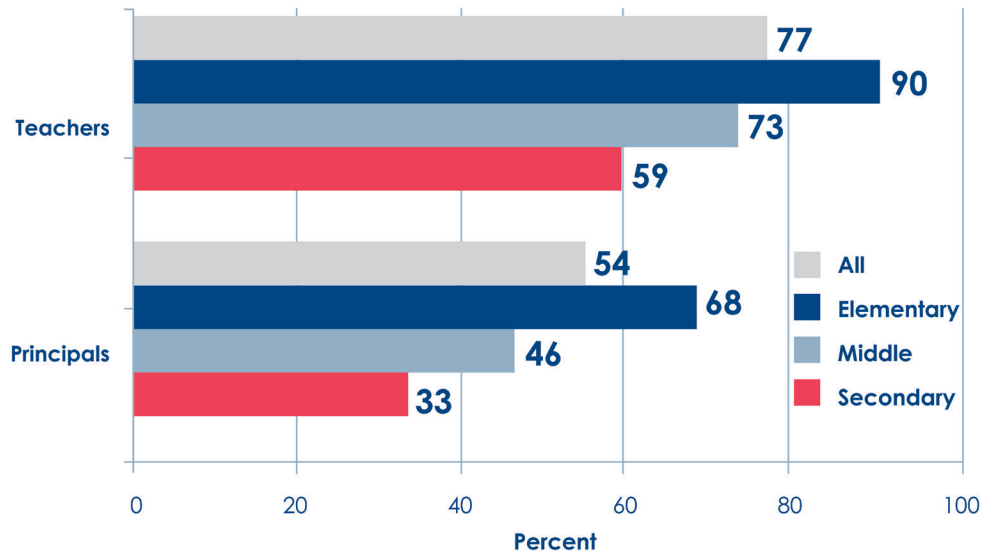
in general, but also growing opportunities in the educational sector, both at the secondary level and in leadership. The increase in female teachers is not spread evenly within schools. There have been only slight increases at the elementary level, already long predominantly female. Increases in the proportion of female teachers have been concentrated at the secondary level, where the majority of teachers were male until the late 1970s. And there have been even sharper increases in the proportion of female public school principals, over half of whom were female by 2015–16 (see Figure 8), up from 31 percent in 1987–88. The latter sub-trend, especially, could be a factor in the recruitment as well as the retention of females, including those of high academic ability—an issue we address in Trend 6. Historians (e.g., Strober & Tyack, 1980; Tyack, 1974) have long held that when the public school system was created at the end of the 19th century, teaching was designed as a predominantly female occupation, while educational administration was designed to be men's work. Part of the rationale was that the recruitment and retention of capable males required a career ladder with opportunities for advancement and enhancement in status, pay, and authority. Hence the opening up of educational administration to women—demonstrated by the rapid

growth in the numbers of female principals—could be one possible explanation for the continuing attraction of teaching and education careers for women, despite the growth of other employment opportunities.

Another contributing factor might be that the proportion of adult women entering the paid workforce as a whole has dramatically increased. Hence, while women have more job choices than in the past, the large overall increase in women seeking employment may be partly responsible for the large increase in females entering teaching. Data from the Bureau of Labor Statistics indicate that in a number of specific occupations and professions the number of women has gone up at a faster rate than in teaching. But the data also show that the number of women in teaching has continued to increase at a rapid rate. The number of women employed in the U.S. labor force overall increased by 36 percent between 1988 and 2016, from 55 million to 74 million. However, the number of women in K–12 public school teaching increased by more than twice that rate—by 79 percent—during the same period. The proportion of all employed females who were teachers rose from 3 percent to 3.9 percent during the same period. That is, teachings' share of employed women has gone up, not down, during the same time

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Figure 8
Percent Female Public School Teachers and Principals, by School Level, 2015–16



that the number of women dramatically increased in many male-dominated occupations and professions. It appears that the increase in women in teaching is more than simply a result of more women in the workforce.

Yet another factor might have to do with negotiating the dual roles of homemaker and breadwinner—the fit between job and family. Historians argue that one factor behind the high proportion of women in teaching over the past century was the relatively workable fit between the job of teaching and the job of child rearing (Strober & Tyack, 1980). From this viewpoint, with shortened days and summers off, caring for a family was more manageable for teachers than for women in many other jobs and careers. This workday structure may still be attracting women to teaching.

What are the implications of this trend?

If the trend continues, we may see a day when 8 of 10 teachers in the nation will be female. An increasing percentage of elementary schools will have no male teachers. An increasing number of students may encounter few, if any, male teachers during their time in either elementary or secondary school. Given the importance of teachers as role models, and even as surrogate parents for some students, certainly some will see this trend as a problem and a policy concern.

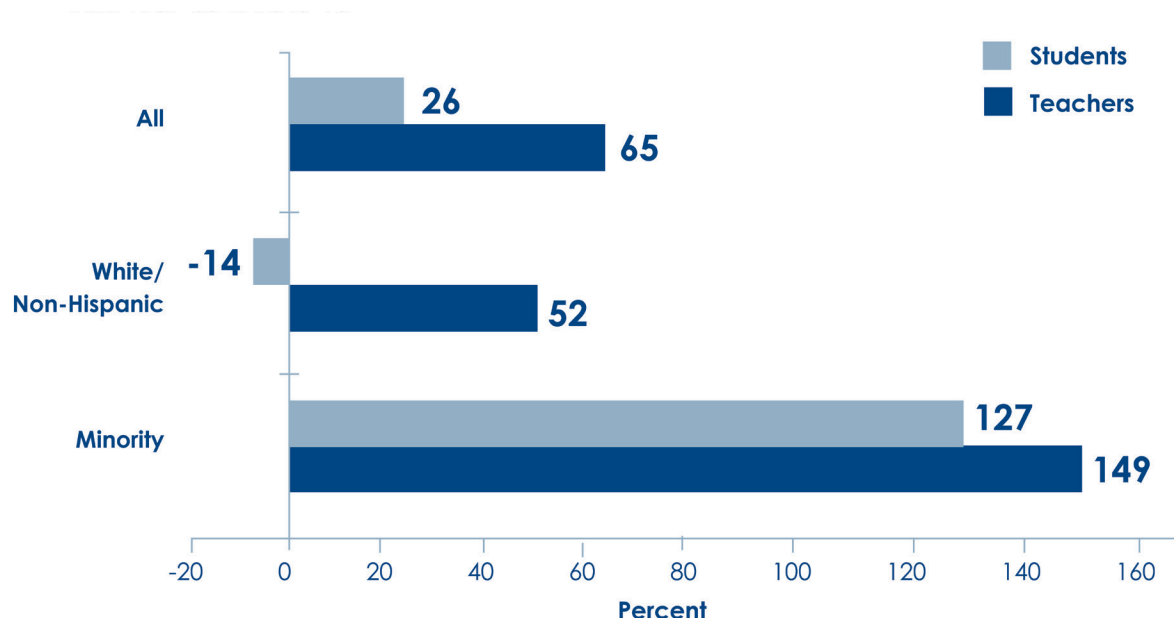
Moreover, an increasing proportion of women in

teaching may have implications for the stature and status of teaching as an occupation. Traditionally, women's work has been held in lower esteem and has paid less than male-dominated work. If the feminization of teaching continues, what will it mean for the way this line of work is valued and rewarded?

Trend 5: More Diverse, by Race–Ethnicity

While the teaching force is becoming more homogenous gender-wise, the opposite is true for the race/ethnicity of teachers. At first this finding may also seem odd. For several decades, shortages of minority teachers have been a major issue for U.S. schools. It is widely held that, as the nation's population and students have grown more diverse, the teaching force has not kept pace. The result, in this view, is that minority students in the nation's schools increasingly lack minority adult role models, lack contact with teachers who understand their racial and cultural background, and often lack access to qualified teachers of any background, because white teachers eschew schools with large percentages of minorities (Irvine, 1988; Ladson-Billings, 1995; Achinstein & Aguirre, 2008; Villegas, Strom, & Lucas, 2012; Lewis & Toldson,

Figure 9
Percent Change in the Number of Public School Students and Teachers, by Race/ethnicity, from 1987–88 to 2015–16



2013). The minority teacher shortage, in turn, is widely viewed as a key reason for the minority achievement gap and, ultimately, unequal occupational and life outcomes for minority students (for reviews, see Torres, Santos, Peck, & Cortes, 2004; Villegas & Lucas, 2004; Zumwalt & Craig, 2005; Albert Shanker Institute, 2015). In response, in recent decades numerous government and nongovernment organizations have instituted and funded a variety of minority teacher recruitment programs and initiatives. By 2008, over half of the states had some kind of minority teacher recruitment policies or programs in place.

But this portrait is changing. Our analyses confirm that teaching remains a primarily white, non-Hispanic workforce and that a gap continues to persist between the percentage of minority students and the percentage of minority teachers in U.S. schools. For instance, in the 2015–16 school year, about 39 percent of the nation’s population belonged to minority groups, 51 percent of all public elementary and secondary school students were minority, but only 19.9 percent of all public elementary and secondary school teachers were minority. But the data also show that this gap is not due to a failure to recruit minority teachers. The gap has persisted in recent years largely because the number of white students has decreased, while the number of minority students has increased. The percent of all public school teachers who belonged to minority groups increased from 13.1 percent in 1987–88 to 19.9

percent in 2015–16. Moreover, these percentages don’t take into account the ballooning of the teaching force. Since the teaching force has dramatically grown, numerically there are far more minority teachers than before. In 1987–88, there were about 305,200 minority teachers employed in public schools; by 2015–16, there were over 760,000. Growth in the number of minority teachers outpaced growth in minority students and was about three times the growth rate of white teachers (see Figure 9). So, although the proportion of minority students in schools is still far greater than the proportion of minority teachers, the public school teaching force has rapidly grown more diverse (for a detailed presentation of our research on this issue, see Ingersoll, May, & Collins, 2017, 2018).

The increase in the number of minority teachers has been something of an unheralded victory. While commentators and researchers have tended to discuss the minority teacher shortage and the outcome of minority recruitment efforts in dire and pessimistic terms, the data suggest that such efforts and expenditures have worked very well. Moreover, our data show that the increase in the number of minority teachers has not been even across different types of schools. Most of the increase has been in higher-poverty public schools (Ingersoll & Merrill, 2017). Minority teachers are two to three times more likely than white teachers to work in hard-to-staff schools serving high-poverty, high-minority, and urban communities. Hence, the data suggest

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that in spite of competition from other occupations for minority college graduates, the widespread efforts over recent decades to recruit more minority teachers and place them in schools serving disadvantaged and minority student populations appear to have been very successful.

However, while minorities have entered teaching at higher rates than whites in recent decades, the data also show that the rates at which minority teachers depart from schools is significantly higher than that of white teachers, and has also been increasing. In the decades from the late 1980s to 2012-13, the annual rate of minority teacher turnover from public schools increased by 45 percent, undermining minority teacher recruitment efforts (Ingersoll, May, & Collins, 2017, 2018). Indeed, the diversification of the teaching force is all the more remarkable because it has occurred in spite of the high turnover rate among minority teachers. We return to the issue of minority teacher turnover in Trend 7.

Trend 6: Consistent Academic Ability

It is widely believed that the “best and brightest” college students find elementary and secondary teaching less attractive than other career and job options. Over the years, data from different sources have seemed to confirm this. For instance, based on the assumption that academic ability is accurately captured by standardized tests, a number of analyses have shown that SAT or ACT scores of college graduates going into teaching have long been well below the average for college graduates. In our own analyses of national data on college seniors from the NCES’ Baccalaureate and Beyond Survey (in both 1999-2000 and 2007-08), we found that this was especially true for those majoring in Education, who tended to have among the lowest average SAT scores. Moreover, within most fields and majors, we found that those who became teachers had lower SAT scores than those in the same field/major who did not go into teaching.

Not only do teachers tend to have below-average academic test scores, some researchers and commentators maintain that the academic ability of teachers has been declining over time—and that gender is at the root of the issue. While the number of women going into teaching has increased, as discussed in Trend 4, proponents of this view have argued that the academic quality of women who choose to go

into teaching has gone down. With alternative careers and jobs increasingly available, this view holds that the “best and brightest” women have decreasingly entered traditionally female-dominated occupations and professions, such as teaching. Indeed, some have concluded that women essentially subsidized the education system for most of the previous century because they were relatively high-ability employees working for relatively low wages. But, the argument continues, this subsidy has stopped, and as a result, the academic caliber of the female portion of the teaching force has declined in recent years.

In the data, however, support for this proposition appears to be mixed. One study looking at trends in female standardized test scores from the 1960s to 2000 found a decline in the proportion of female teachers who scored in the high deciles (Corcoran, Evans, & Schwab, 2004). But another study with data from the Educational Testing Service (ETS) showed no decline in SAT scores of teachers as a whole from the mid-1990s to the mid-2000s (Gitomer, 2007).

Of course, we cannot assume that either the “best and brightest,” or those scoring higher on standardized tests, are the best or the most effective teachers. The way to measure both academic ability and teaching quality are subjects of controversy. Moreover, the relationship between teachers’ academic ability and their teaching quality is unclear. But academic ability is often assumed to be an important indicator of both the caliber of employees in any line of work and the attractiveness of an occupation or profession.

We examined these trends using another possible measure of academic ability—the selectivity or competitiveness of one’s undergraduate institution, which is no doubt correlated with SAT/ACT and other standardized test scores. The measure we used is Barron’s six-category ranking of colleges and universities: most competitive, highly competitive, very competitive, competitive, less competitive, not competitive. The top two categories accounted for about 14 percent of institutions and about 21 percent of undergraduates. The bottom two categories accounted for about 19 percent of institutions and about 13 percent of undergraduates.

What did we find?

Just under one tenth of newly hired first-year public school teachers come from the top two categories of higher education institutions. About a quarter come from the bottom two categories. About two thirds of

Figure 10
Percent 1st-Year Public School Teachers, by Selectivity of Their Undergraduate College/University, 1987–88 to 2015–16

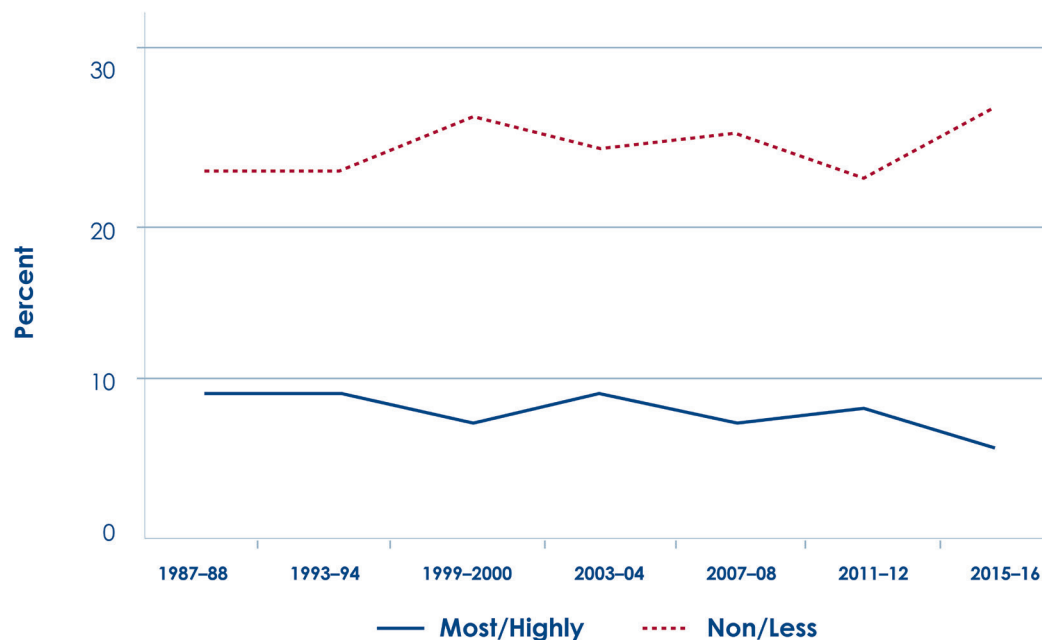
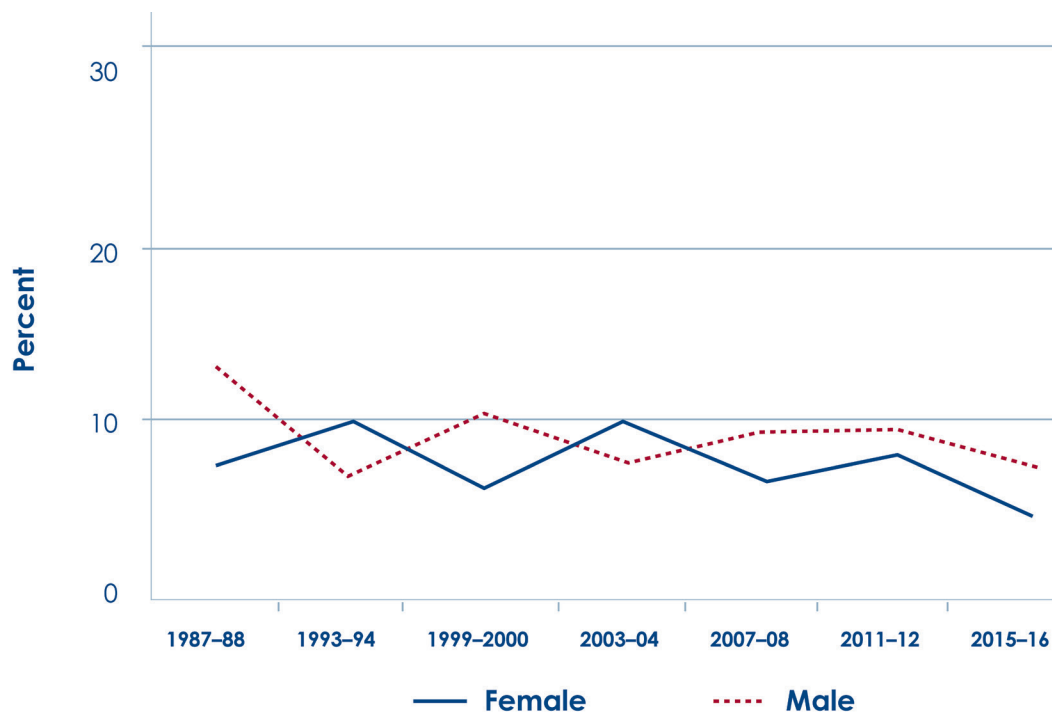


Figure 11
Percent 1st-Year Public School Teachers, with Undergraduate Degrees from the Most and Highly Selective Colleges/University, by Gender, 1987–88 to 2015–16



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first-year teachers come from middle-level institutions. From 1988 to 2012 these proportions tended to fluctuate both up and down slightly. Between 2011-12 and 2015-16 these levels appear to have changed, with a higher proportion from the least selective colleges and a smaller proportion from the most selective schools (see Figure 10).

There are, however, differences in college selectivity by gender.

Interestingly, beginning male teachers in public schools have often been slightly more likely to come from top-ranked institutions than have female teachers (see Figure 11). And, while the levels fluctuated between 1987-88 and 2015-16, there appears to have been an overall decrease in the proportion of first-year male teachers in public schools from the top two ranks of institutions—from 13.3 percent in 1987-88, to 9.5 percent in 2011-12, and to 7.8 percent in 2015-16.

For first-year female teachers in public schools the proportion coming from the top two categories of institutions also fluctuated from year to year. There also appears to have been a decrease in the proportion of first-year female teachers in public schools from the top two ranks of institutions—but only between 2011-12 and 2015-16. Moreover, the percentages by gender for 2015-16 must be interpreted with caution because of a smaller sample size.

Once again, however, these percentages do not tell the whole story. Although the percentage of female teachers from top institutions has not changed much since the late 1980s, because the teaching force has ballooned (Trend 1) and has also become more female (Trend 4), numerically teaching has been employing far more female candidates from all of higher education, including top colleges and universities.

Hence, assuming our college selectivity measure of academic ability is valid, our data show that there has been a decrease in the proportion of male teachers from top institutions since the late 1980s. But these data also show this trend has been less true of female teachers. Perhaps we should call the latter a non-trend. So, contrary to the view that there has been a decline in the academic caliber of female teachers, our data suggest this has not been true in the past three decades.

Along with the increase in the numbers and proportions of female teachers, we do not know the reasons for the apparent stability in the academic ability of females entering teaching in recent decades.

As we suggested in Trend 4, perhaps the increased opportunities for women in school leadership and positions in secondary schools (see Figure 8) have been attractive incentives for able and ambitious females to enter education.

Trend 7: Unstable

Elementary and secondary teaching has long been marked by relatively high rates of annual departures of teachers from schools and from teaching altogether (Lortie, 1975; Tyack, 1974). For instance, analyzing national data from the Baccalaureate and Beyond survey, we found that teaching does have less attrition—those leaving the occupation entirely—than some other occupations, such as child care, secretarial, and paralegal fields (see figure 12). Attrition rates are similar for teachers and police officers. Perhaps surprisingly, teacher attrition is higher than nursing attrition, and teachers have far higher attrition than traditionally highly respected professions, such as law, engineering, and architecture (Ingersoll & Perda, forthcoming).

But these overall figures mask large differences in departure rates among different types of teachers and different locales, revealing the need to disaggregate our data. The flow of teachers out of schools is not equally distributed across states, regions, and school districts. The largest variations in teacher departures by location, however, are those between different schools, even within the same district. This includes both major components of total turnover – movers (teachers who move between districts and schools) and leavers (those who leave teaching altogether). The data show that almost half of all public school teacher turnover takes place in just one quarter of the population of public schools. The data show that high-poverty, high-minority, urban, and rural public schools have among the highest rates of turnover. Moreover, the data show there is an annual asymmetric reshuffling of significant numbers of employed teachers from poor to not-poor schools, from high-minority to low-minority schools, and from urban to suburban schools (Ingersoll & May, 2012).

The data also show that rates of both moving between schools and leaving teaching altogether differ by the race/ethnicity of the teacher. As mentioned in Trend 5, over the past couple of decades, minority teachers have had significantly higher rates of turnover than white teachers. Moreover, the gap has widened in recent years. Why is this? Strikingly, while the

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Figure 12

Among 1993 College Grads Who Entered Selected Occupations by 1997, Percent Gone From Occupation by 2003

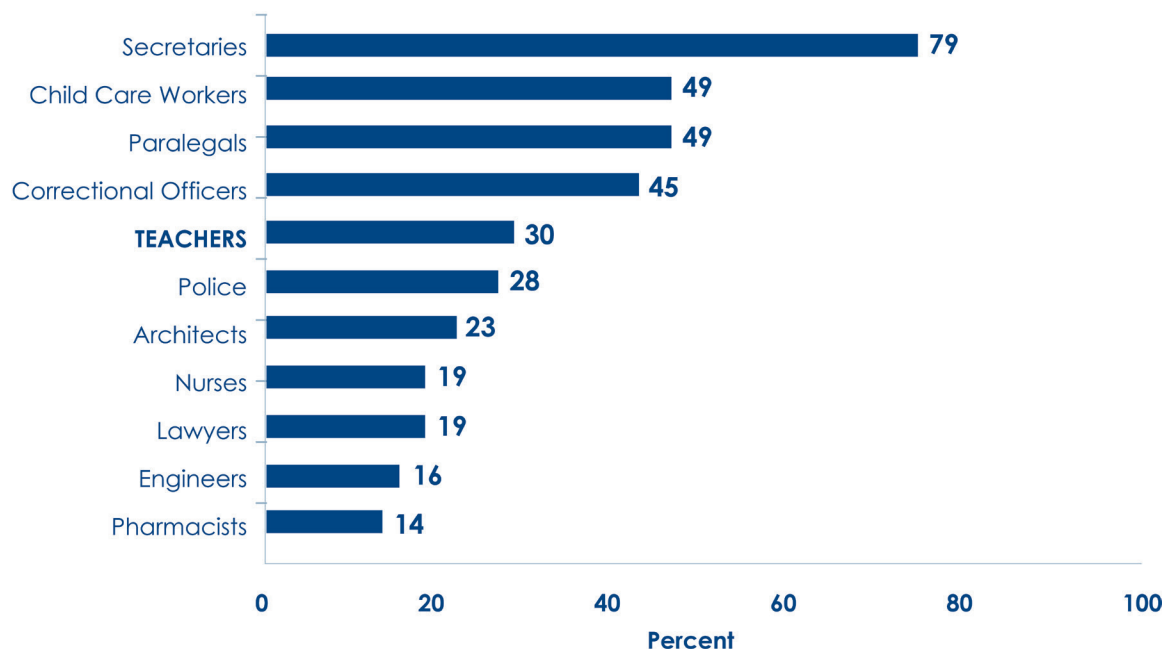


Figure 13

Cumulative Percent Attrition of Beginning Public and Private School Teachers, by Years of Experience 1993–2003

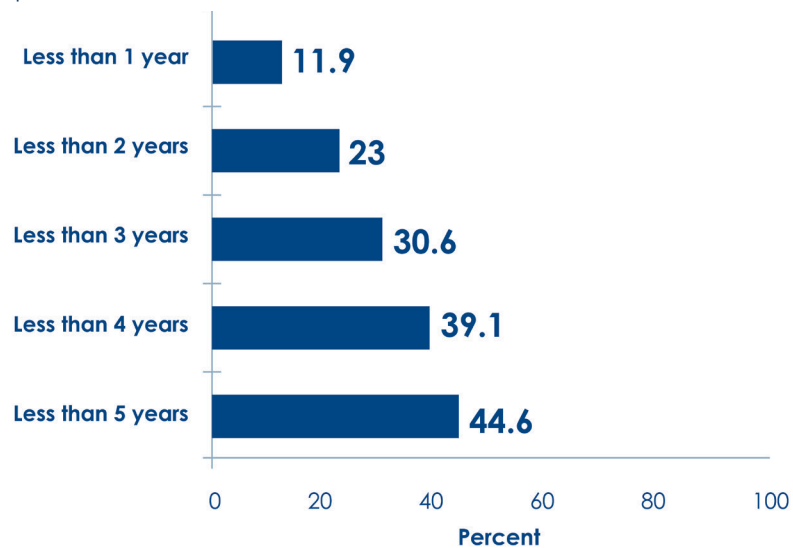
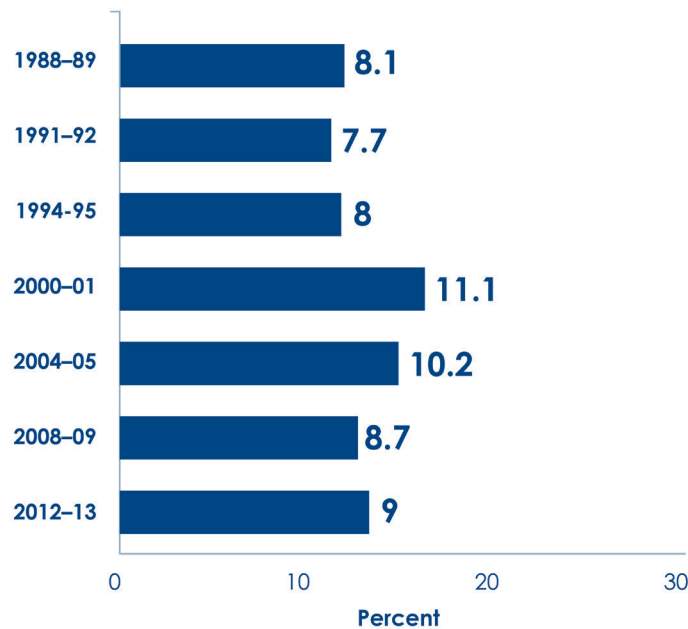


Figure 14
Percent Annual 1st-Year Public School Teacher Attrition, 1988–89 to 2012–13



demographic characteristics of schools appear to be highly important to minority teachers' initial decisions as to where to teach, this doesn't appear to be the case for their later decisions about whether to stay or depart. What does impact their decisions, our analyses show, are school working conditions, in particular the degree of autonomy and discretion teachers are allowed over issues that arise in their classrooms, and the level of collective faculty influence over school-wide decisions that affect teachers' jobs. The same difficult-to-staff schools that are more likely to employ minority teachers are also more likely to offer less-than-desirable working conditions, according to our data, and these conditions account for the higher rates of minority teacher turnover. These high levels of turnover, of course, undermine efforts to diversify the teaching force (Ingersoll, May, & Collins 2017, 2018).

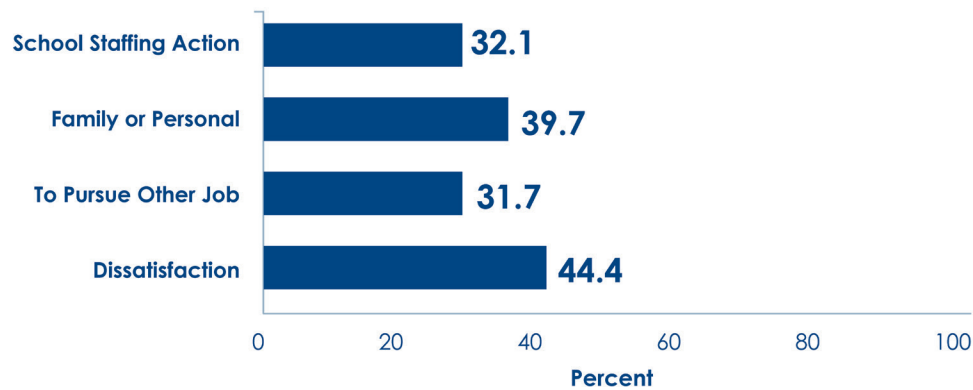
Beginning teachers, regardless of their race, have among the highest rates of turnover of any group of teachers. Almost two decades ago we estimated that between 40 to 50 percent of those who enter teaching leave teaching within 5 years (Ingersoll, 2003). This figure has been widely reported since, but it was only a rough estimate using cross-sectional national data.

More recently, using national longitudinal data from the Baccalaureate and Beyond survey, we were able to more accurately document rates of cumulative beginning teacher attrition (see Figure 13). We found that more than 44 percent of new teachers in public and private schools leave teaching within 5 years of entry.¹

Moreover, we have also found, despite a temporary dip after the 2008 recession, that high levels of attrition among beginning public school teachers have been holding steady or even slightly increasing since the late 1980s (Figure 14). Again, however, an increase in the annual percentage does not tell the whole story. Because the teaching force has grown dramatically larger, numerically there are more beginners than before (Trend 3), and hence the actual numbers of teachers who quit the occupation after their first year on the job has also increased. Soon after the 1987–88 school year, about 7,500 first-year public school teachers left teaching, while just after the 2008–09 school year, about 13,500 first-year public school teachers left the occupation. There are more beginners in the teaching force, and these beginners are consistently less likely to stay in teaching than others.

¹ Rates of beginning teacher attrition differ between figures 12 and 13. This is largely because attrition in Figure 12 excludes those who left and then later returned to teaching, and because Figure 12 includes only those who entered teaching soon after graduating from undergraduate college and excludes those who entered teaching in later years. First year attrition in Figure 13 (11%) is greater than in Figure 14 because the former includes private school teachers.

Figure 15
Percent 1st-Year Public School Teachers Reporting that Various Reasons Were Important for their Turnover, 2012–13



We also examined the data on the reasons teachers give for their turnover. Of first-year teachers who departed from their school after the end of the 2011–12 school year (including both movers and leavers), a third indicated they had been involuntarily transferred, laid off, or terminated. This included for both budgetary and performance reasons. A larger portion indicated that family or personal issues played an important part in their decision to depart. This set included reasons of health, pregnancy, a residence move, and caring for family members. Another third indicated that they departed to pursue further education or another career. Finally, the most frequently cited set of reasons concerned dissatisfaction with any of a variety of school and working conditions, including salaries, classroom resources, student misbehavior, accountability, opportunities for development, input into decision making, and school leadership (Figure 15).

In sum, beginners – the largest group within one of the largest occupations in the nation – have been leaving at relatively high rates, and these rates have held steady in recent decades. Together, ballooning and turnover indicate a growing flux and instability in the teaching occupation, as both the large numbers of those entering teaching and the large numbers of those leaving teaching have been increasing in recent years.

These changes have large implications. Employee turnover in any occupation has pros and cons, costs and benefits. On the one hand, some degree of employee turnover, with the accompanying job and career changes, is normal, inevitable, and can be efficacious for individuals, for organizations, and for the economic system as a whole. Too little turnover of employees is tied to stagnancy in organizations;

effective organizations usually both promote and benefit from a limited degree of turnover by eliminating low-caliber performers and bringing in “new blood” to promote innovation.

On the other hand, high levels of employee departures are worrisome not only because they can be a symptom of underlying problems in how well organizations function, but also because departures can entail costs and other negative consequences for organizations and for the larger system (Ingersoll & Perda, forthcoming).

As mentioned earlier, we have found that one negative consequence of teacher turnover is its important but often overlooked role in teacher shortages (Ingersoll, 2001; Ingersoll & Perda, 2010; Ingersoll & May, 2012). Turnover is a major factor behind the problems that many schools have staffing their classrooms with qualified mathematics, science, and other teachers. Increases in turnover among minority teachers, especially in disadvantaged schools, undermine efforts to recruit new teachers in hard-to-staff schools and to diversify the teaching force.

Another negative consequence of high levels of beginning teacher attrition is the loss of newcomers before they are able to fully develop their skills. As mentioned earlier, a number of studies have documented the reasonable proposition that teachers’ effectiveness—as measured by gains in their students’ test scores—increases significantly with additional experience for the first several years in teaching (e.g., Henry, Fortner, & Bastian, 2012; Kane, Rockoff, & Staiger, 2006).

Conclusion

Has the elementary and secondary teaching force changed in recent decades? The answer is most certainly yes—and in a number of important ways. It has become far larger. It has simultaneously become older, younger, and far less experienced. It has simultaneously become less diverse, by gender, and more diverse, by race-ethnicity. It does not appear to be suffering from a decline in the academic ability of females entering teaching; indeed, the numbers of new teacher hires coming from the top-ranked colleges and universities has greatly increased. Finally, it remains unstable.

For each of these trends large questions immediately arise. What are the reasons for, and sources of, the trend? Will the trend continue, and what impact will it have? In this report we have offered some hypotheses for these questions.

It is also striking that while these trends raise important questions, until recently we have seen little awareness or discussion of many of them or their implications—whether by researchers, by policy makers, by educators, or by the public. But there are good reasons to investigate the sources and continuation of these changes—because if these trends do indeed continue, there will be large implications, with serious financial, structural, and educational consequences for America's educational system.

For instance, will the teaching force continue to outgrow the student population it serves, and, if so, why? If the teaching force does continue to balloon in size, the expense to local school districts could become unsustainable, and without an increase in funds, districts may increasingly turn to cutting teacher salary levels.

Will the hiring, and thus the greening trend, continue? In turn, will an increasing number of new hires decide not to stay in teaching, making teaching increasingly an occupation practiced by the young and inexperienced, and if so, why? If this trend continues, the expense to local school districts could become more sustainable, because of lower overall average salary costs per employee. In other words, will there effectively be a financial tradeoff between the numbers of teachers and their experience? On the other hand, as the older portion of the teaching force finishes retiring, will a large portion of the newcomers decide to stay with teaching to become the next generation of veterans?

Will the teaching force continue to become more female, and if so, why? If the teaching force does continue to become even more female-dominated, with the presence of male role models a rarity for an increasing number of students in their K-12 school years, will there be negative implications for students, both male and female?

Perhaps there is an irony in these changes. Historians tell us that when the public school system was invented a century ago, the teaching force was transformed into a mass occupation that was relatively low-paying, temporary, and designed predominantly for young, inexperienced women, prior to starting their “real” career of child rearing (e.g., Lortie, 1975; Tyack, 1974). Perhaps the changes we have traced represent not an entirely new face but a return to the old face of the American teaching force.

A return to an old composition could have serious implications for the future status of elementary and secondary teaching in the United States. Professionalization has long been a source of both hope and frustration for teachers. Since early in the 20th century, educators have repeatedly sought to upend the notion that teaching is akin to lower-skill industrial work where teachers are interchangeable and easily replaced, and they have sought to promote the view that teaching is highly complex work, requiring specialized knowledge and skills, and deserving of the same status as traditional professions, like law, medicine, engineering, and academia. These efforts to enhance the professional status of teaching have also long met with limited success. And if teaching becomes an even larger, lower-paying line of work, predominantly employing young, inexperienced women, who stay for limited periods, it does not suggest optimism for the aspirations to promote the image of teaching as a respected profession.

At the same time, these possible future trajectories, and similarities between the contemporary transformation of the teaching force and its previous incarnation, are strictly speculative on our part. Nothing in our data analyses so far can be considered conclusive evidence that the teaching force is, or will be, “better” or “worse” in one way or another. As we indicated at the beginning of this report, thus far our objective has been exploratory and suggestive. At this point we have more questions than answers.

What is clear is that large-scale changes are happening to one of the nation's largest occupational groups. Right after World War II and before the post-

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war baby boom, there were just over three quarters of a million elementary and secondary teachers in the United States. By 2015-16, there were more than five times as many—over 4 million elementary and secondary teachers. In the 2015-16 school year alone, almost 200,000 newcomers entered public school teaching. These data suggest a very large opportunity—one of the largest occupations in the nation is being expanded, replaced, and re-made. Who will our new teachers be? We plan to undertake further research to answer this question.

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