# Attrition over Time for Teachers and Comparison Professions

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## Abstract

In this brief I estimate the trend in teacher attrition over time and relate it to attrition trends for arguably comparable professions including nursing, social work, and accounting. Using a repeated cross-sectional analysis, I find that the national rate of teacher attrition has remained strikingly stable over the past 20 years at around eight percent and exhibits less variation than comparable professions. In recent years teachers and nurses share similar attrition rates. Higher labor force participation among older teachers approaching retirement explains a small decrease in the attrition rate between 1996 and 2018.

## Introduction

High rates of teacher attrition impose considerable financial and educational costs on school districts.[1] An important unresolved question is whether the rate of teacher attrition in the United States is higher than expected, particularly in relation to other vocational professions. Using pooled data from the Current Population Survey (CPS) between 1992 and 2001, Harris and Adams (2007) estimate that almost eight percent of teachers leave their jobs each year, a figure comparable to the attrition rate for nurses. It is unclear, however, whether a similar attrition rate between teachers and nurses persisted after 2001.[2]

In this brief, I use repeated cross-sectional data from the CPS to construct five-year moving averages of attrition rates for teachers, nurses, social workers, and accountants. Teacher attrition was 7.6 percent in 1996 and fell to 7.1 percent by 2018. Teacher attrition remained strikingly stable over time and exhibited less variation than comparison professions. The share of teachers becoming unemployed increased over time, albeit from a small base, while the share exiting the labor force decreased. I find that a well-established U-shaped relationship between teacher age and attrition persisted over time but became flatter at older ages as fewer late career teachers left the labor force. The lower attrition rate among older teachers approaching retirement largely accounts for the 0.5 percentage point fall in overall attrition between 1996 and 2018.

## Data

I use data from the Annual Social and Economic Supplement (ASEC) of the Current Population Survey, a nationally representative survey of the U.S. population, from 1992 to 2018. In addition to basic demographic information, ASEC respondents are asked for their job/occupation last week and the longest job held in the prior year. I use occupation last year to identify teachers, nurses, social workers, and accountants, and identify attrition through differences in last years' and last week's stated occupation (Harris & Adams, 2007). Nursing and social work are, like teaching, vocational professions with a caregiving aspect to the job; moreover, the comparison professions are majority female. I pool CPS surveys over five years to create a sample of sufficient size to construct attrition rates for specific occupations. I restrict samples to college graduates between 21 and 64 years old and apply individual weights to make nationally representative inferences.

## Results

Figure 1, panel A, shows trends in attrition rates for teachers and comparison professions. The rate of teacher attrition is strikingly stable over time at around eight percent, peaking at 8.6 percent in 2002 and falling to 7.1 percent by 2018.[3] Nurses and accountants have attrition rates within two percentage points of teachers. Accountants trend similarly to teachers through 2012 before dipping to around six percent. Nurses diverge to a lower attrition rate than

teachers in 2002 but share a similar rate with teachers after 2015. Attrition for social workers is higher and exhibits more variation over time than the other professions.

Panel B of Figure 1 decomposes teacher attrition by separation type: leaves the labor force, switches to a new profession, or becomes unemployed. Over half of attrition in 2018 is teachers leaving the labor force, including retirement. Around 30 percent is due to teachers switching to a new profession, while the remaining teachers become unemployed. As a share of overall attrition, leaving the labor force falls by six percentage points from 1996 to 2018 while unemployment doubles from five to 10 percent.

Figure 2 analyzes the relationship between teacher age and attrition by plotting attrition by age group in 1996 and 2018. There is a U-shaped relationship between age group and attrition, with those approaching retirement age most likely to leave the teaching profession.[4] The decrease in the attrition rate between 1996 and 2018 is largely driven by fewer older teachers leaving the labor force (see panels A and B). Younger teachers aged 30-34 are also less likely to leave the labor force or become unemployed, lowering the attrition rate by 2 percentage points. In Appendix Figure 2, I graph attrition by age group and sex and find that the attrition rate for male teachers aged 60-64 fell by 10 percentage points more than for females.

In Figure 3, I compare changes in the attrition rate (all separators) by age group between teachers and comparison professions. None of the comparison professions exhibit the same U-shaped relationship between age group and attrition as teachers. Higher attrition rates among the youngest age groups is common to teachers and social workers but not for nurses and accountants. Nurses, however, share with teachers declining attrition rates among older workers, whereas there is no statistically significant change over time in the rate of attrition by age group for social workers or accountants.[5]

## Discussion and Conclusion

The question of whether the national rate of teacher attrition in the U.S. is higher than expected is important for the design of teacher hiring and retention policies. I find that (i) teacher attrition is strikingly stable over time at around eight percent, (ii) nurses and accountants have similar rates of attrition as teachers, albeit with additional variation over time, (iii) slightly fewer teachers are exiting the labor force or switching to a new profession, while unemployment is a larger fraction of overall attrition, and (iv) the U-shaped age-attrition relationship is becoming flatter at older ages as fewer teachers leave the labor force; a similar pattern holds for nurses.

It is instructive to consider how the comparative evidence on the age-attrition relationship for teachers and nurses conforms to the existing literature.

Auerbach, Buerhaus, and Staiger (2014) find that nurses are delaying retirement and Maestas and Zissimopoulos (2010) report Bureau of Labor Statistics projections showing marked rises in labor force participation rates over the last 30 years, particularly for women aged 55-64. But, to date, there is little evidence that teachers specifically are remaining in the labor force longer. Fitzpatrick (2018) finds that older college-educated women who ever worked as teachers experience lower increases in labor force participation than women who never taught, primarily because defined-benefit pension schemes common to the teaching profession incentivize teachers to retire earlier than Social Security. Her analysis is consistent with a lower teacher attrition rate over time in that older teachers aged 60 to 64 in the most recent birth cohorts (born 1946 to 1950) are employed at higher rates than earlier cohorts, although the increase is less than for other college educated women.

## Notes

1. *Teacher attrition* refers to teachers who leave the labor force, switch to a new profession, or become unemployed. I avoid using the term *teacher turnover* because it commonly includes teachers who move within the teaching profession, and this group of teachers is excluded from my analysis.

2. I refer to pooled CPS samples by the final year of pooled data, e.g., average attrition using pooled data from 1992 to 1996 is referred to as 1996.

3. The finding that teacher attrition is stable over time relative to the comparison professions is robust to pooling CPS samples over shorter or longer windows than five years. Appendix Figure 1 shows that a similar interpretation of attrition trends remains when pooling over three years or 10 years.

4. The U-shaped relationship between teacher age and attrition is well-established (e.g., Harris & Adams, 2007; Ingersoll, 2001).

5. There is one exception – the attrition rate decreases over time for accountants aged 50 to 54.

# References

Auerbach, D. I., Buerhaus, P. I., & Staiger, D. O. (2014). Registered nurses are delaying retirement, a shift that has contributed to recent growth in the nurse workforce. *Health Affairs, 33*(8), 1474-1480.

Fitzpatrick, M. D. (2018). Teaching, teachers' pensions, and retirement across recent cohorts of college-graduate women. In C. Goldin & L. F. Katz (Eds.), *Women working longer: Increased employment at older ages* (pp. 217-238). Chicago, IL: The University of Chicago Press.

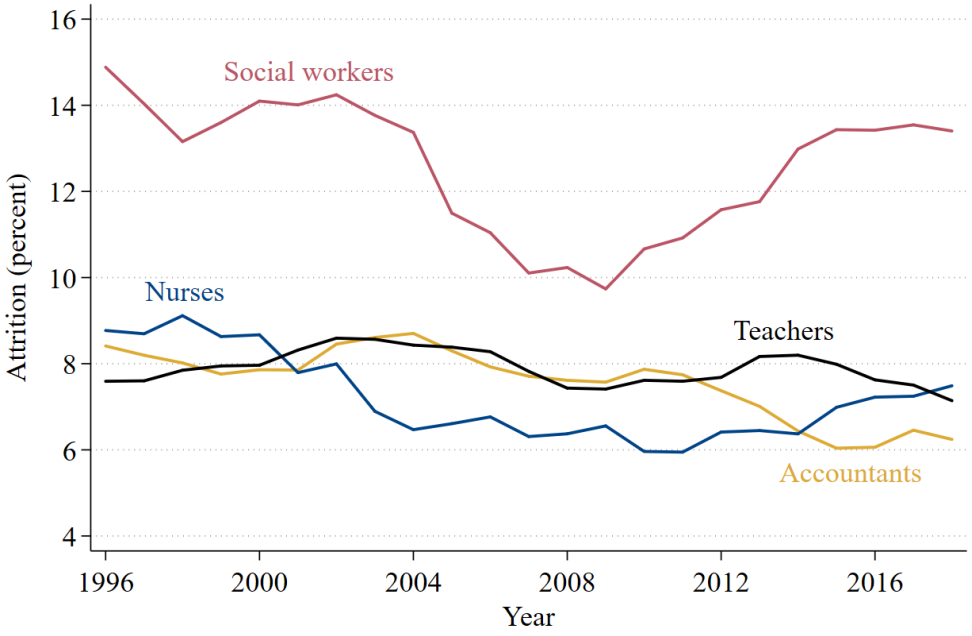
Harris, D. N., & Adams, S. J. (2007). Understanding the level and causes of teacher turnover: A comparison with other professions. *Economics of Education Review, 26*(3), 325-337.

Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38*(3), 499-534.

Maestas, N., & Zissimopoulos, J. (2010). How longer work lives ease the crunch of population aging. *Journal of Economic Perspectives, 24*(1), 139-60.

Figure 1: Trends in attrition

Panel A: Attrition for teachers and comparison professions




Panel B: Teacher attrition by separation type

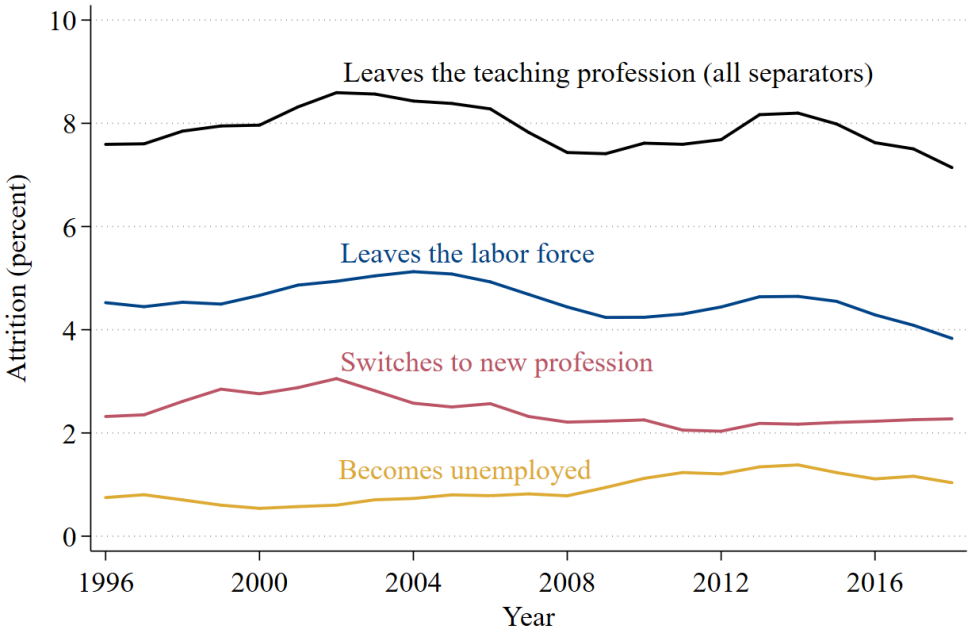


Figure 2: Teacher attrition by separation type and age group, 1996 and 2018

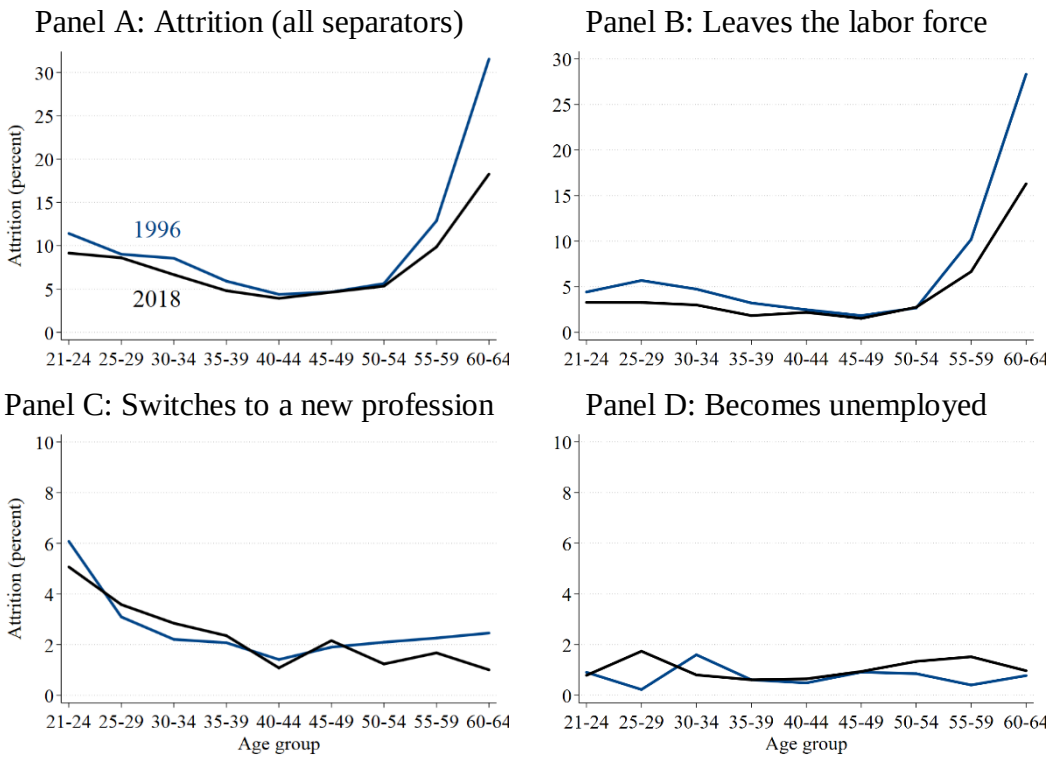
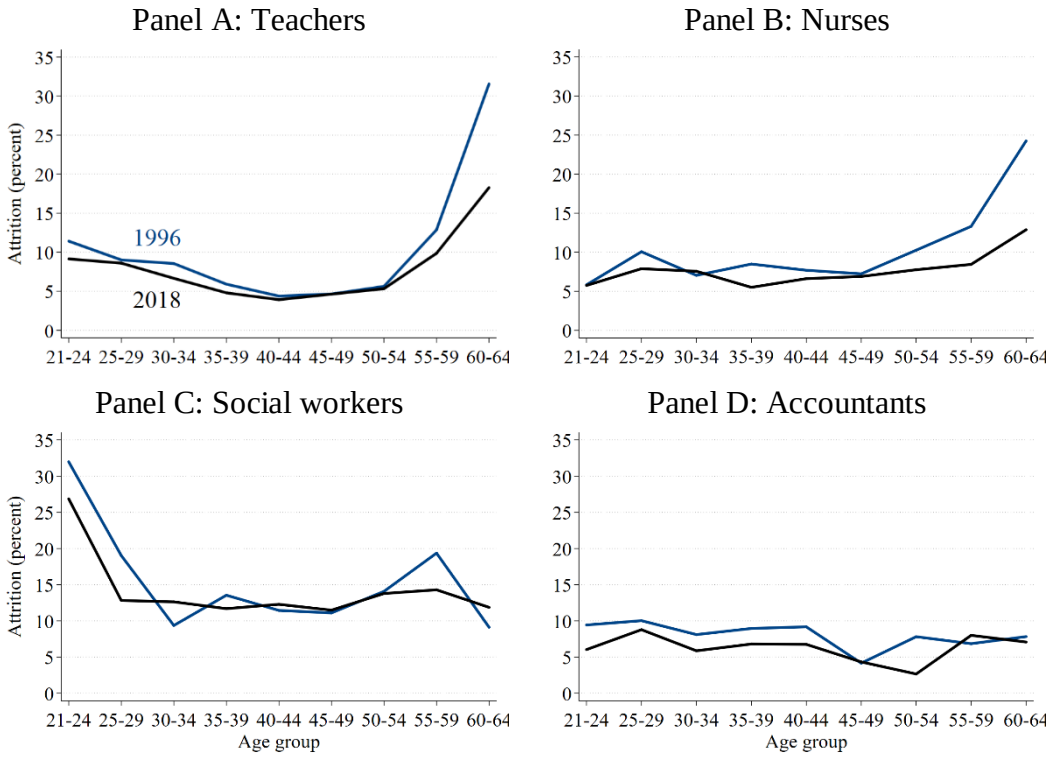


Figure 3: Attrition (all separators) by profession and age group, 1996 and 2018



## Figure Captions

Figure 1: Panel A shows attrition over time using a repeated cross-sectional analysis. Attrition in a given year is calculated using five years of pooled data, e.g., attrition rates in 1996 are calculated using pooled data from 1992 to 1996. Occupations are defined using consistent occupation codes over time; see the methods appendix for more detail. Panel B decomposes teacher attrition into three types of attrition: leaves the labor force, switches to a new profession, or becomes unemployed. The data source is the Annual Social and Economic Supplement of the Current Population Survey (CPS). The sample is restricted to college graduates from 21 to 64 years of age. Means are weighted by person weights in the CPS.

Figure 2: Panel A shows attrition rates by age group in 1996 and 2018, which are calculated using pooled data from 1992 to 1996 and 2014 to 2018 respectively. Panels B, C, and D decompose attrition for all separators, shown in panel A, by attrition type. The data source is the Annual Social and Economic Supplement of the Current Population Survey (CPS). The sample is restricted to college graduates from 21 to 64 years of age. Means are weighted by person weights in the CPS.

Figure 3: The panels show attrition rates by age group for a given occupation in 1996 and 2018, which are calculated using pooled data from 1992

to 1996 and 2014 to 2018 respectively. The data source is the Annual Social and Economic Supplement of the Current Population Survey (CPS). The sample is restricted to college graduates from 21 to 64 years of age. Means are weighted by person weights in the CPS.

## Appendix: Methods

In this brief I analyze trends in teacher attrition and comparison professions using data from the Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS).[1] I identify a respondent's profession using their job/occupation last week and the longest job held in the prior year. Attrition is identified through differences in last year's and last week's stated occupation. Appendix Table 1 shows the CPS occupation code definitions of all four professions over time. Teachers include public and private school teachers.

I pool CPS samples over multiple years to create a sample of sufficient size to construct attrition rates for specific occupations. My preferred pooling size is five years, which in my opinion strikes a balance between sample size and not overly smoothing trends. To calculate moving averages, I construct repeated cross-sectional samples by dropping the first year of the pooled sample and adding a subsequent year of data, maintained a five-year sample window. I restrict samples to college graduates between 21 and 64 years of age and apply individual weights to make nationally representative inferences.

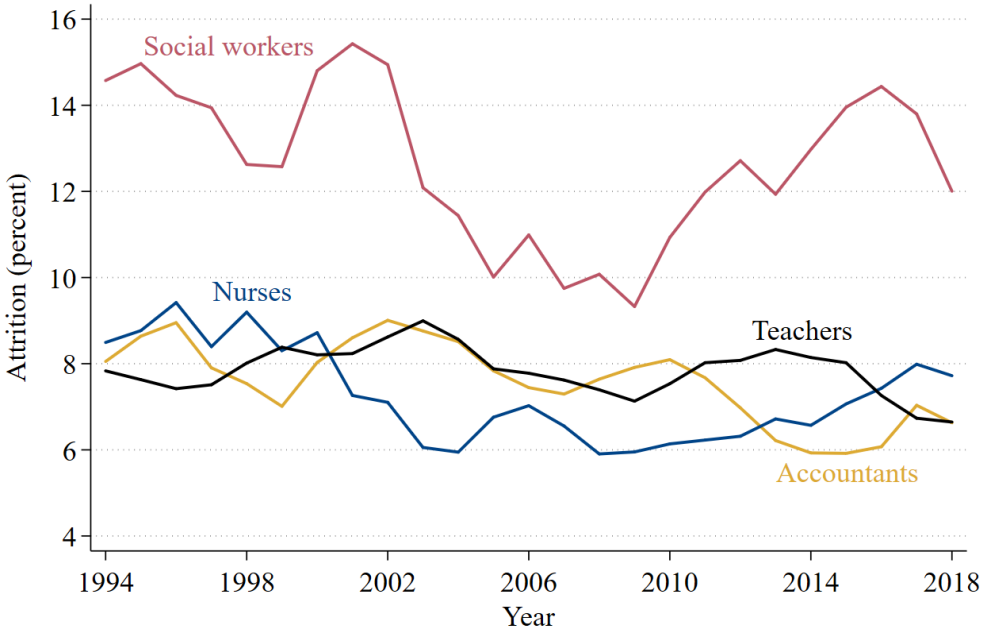
Appendix Table 2 presents descriptive statistics by profession for the earliest pooled sample, which uses data from 1992 to 1996, and the most recent sample, with data from 2014 to 2018. The table shows that teachers and the comparison professions, particularly nurses and social workers, have many

similar demographic and job-related characteristics. Accountants are less female, tend to work in smaller organizations, and are less likely to be enrolled in a pension plan than teachers.

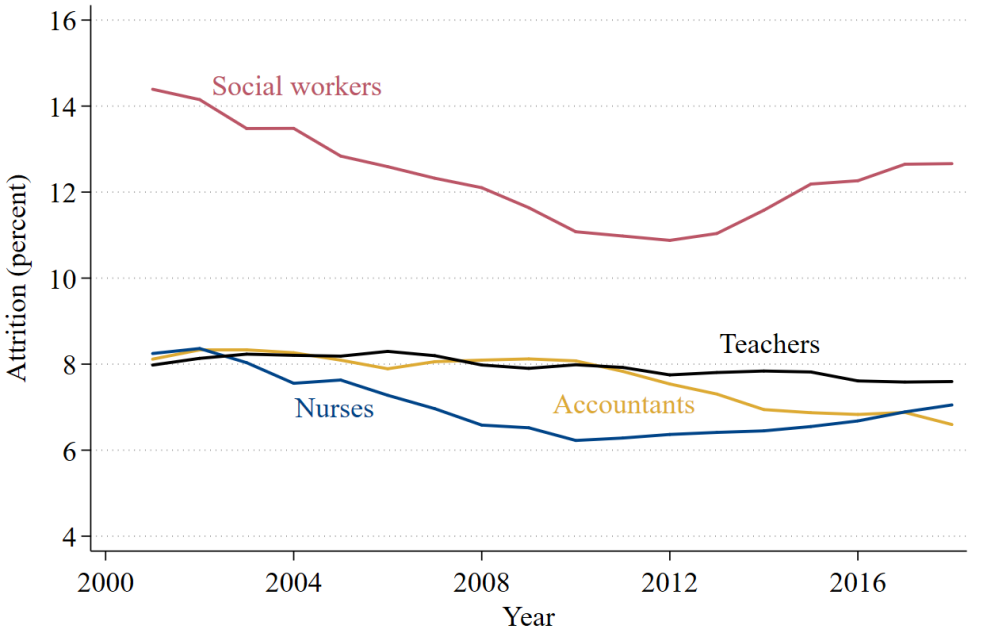
To determine which age groups have a statistically significant change in attrition over time in Figures 2 and 3, I regress attrition on age group indicators and interaction terms between the age group indicators and an indicator for the most recent sample, with no intercept term. I restrict the analysis sample years to 1992 to 1996 and 2014 to 2018.

Appendix Figure 1: Trends in attrition by alternative moving average definitions

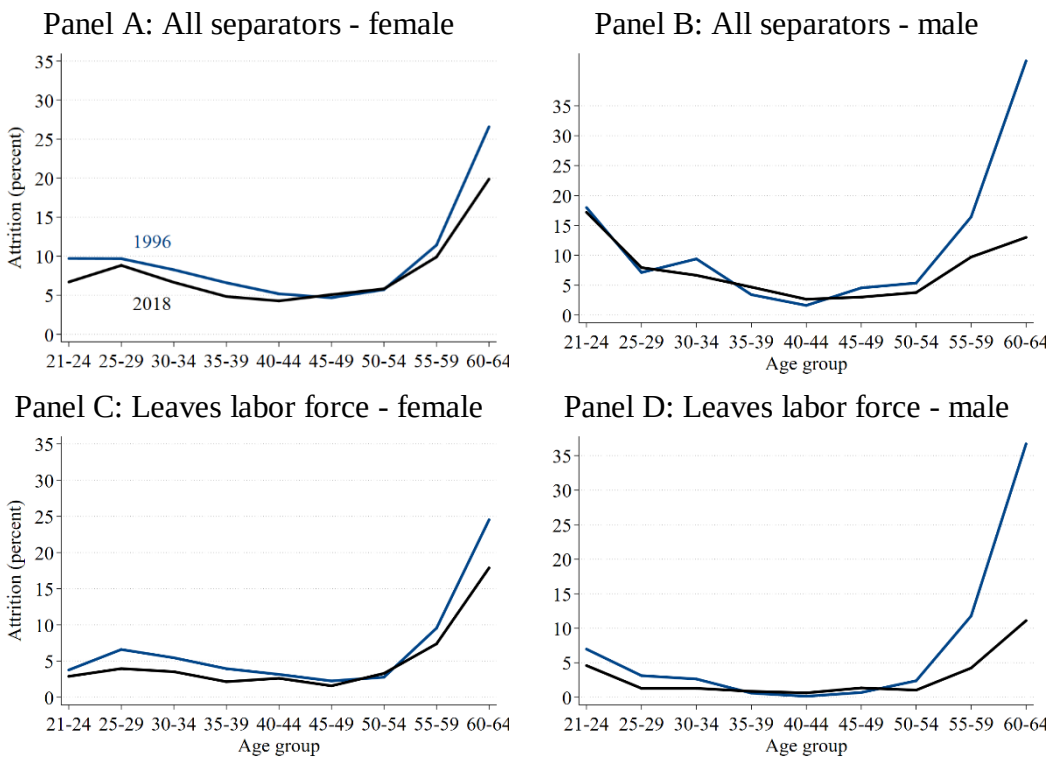
Panel A: Three-year moving average




Panel B: Ten-year moving average

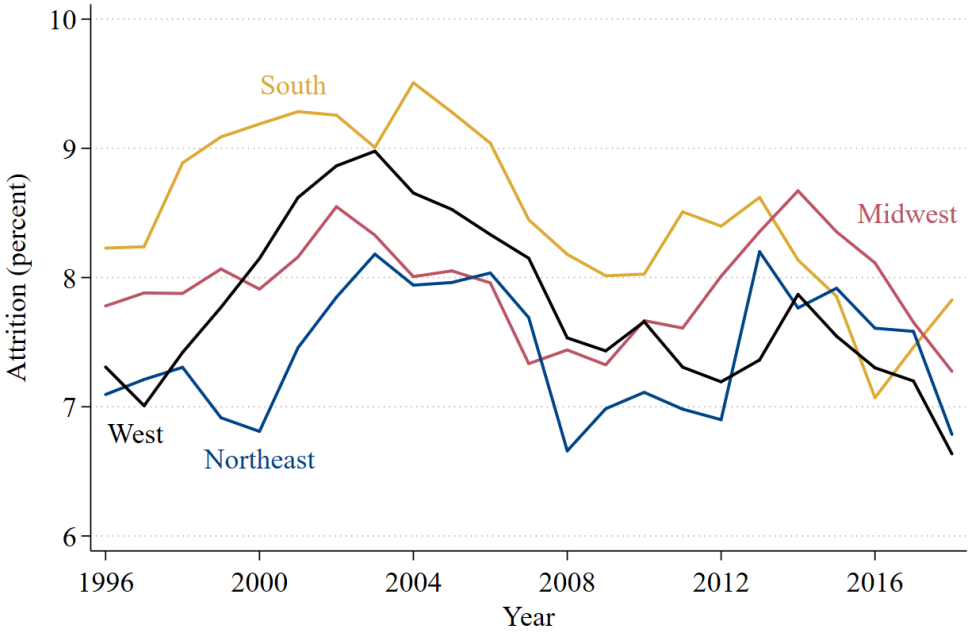


Appendix Figure 2: Teacher attrition by separation type, age group, and sex

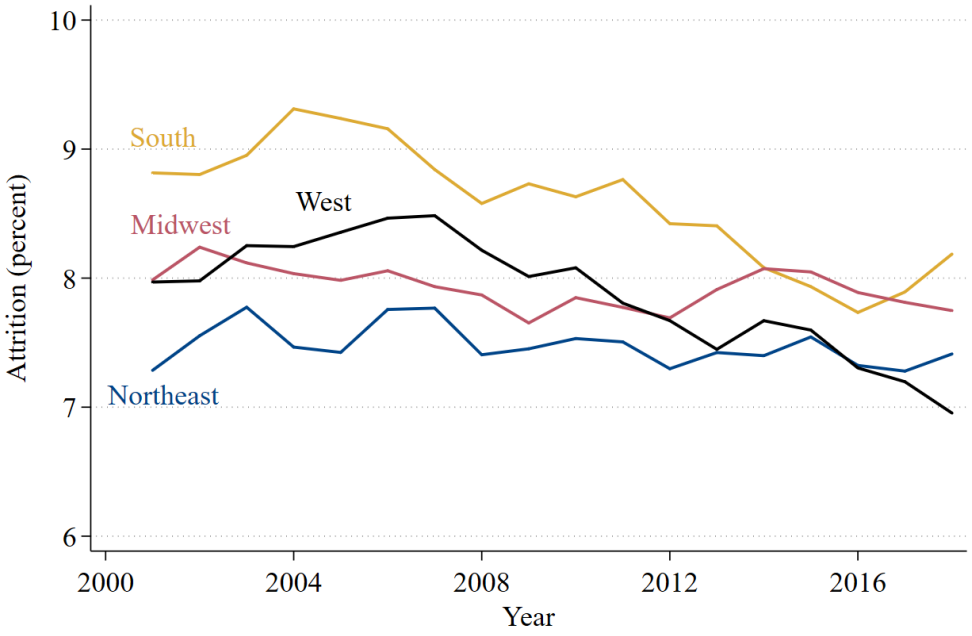


Appendix Figure 3: Trends in attrition by region

Panel A: Five-year moving average




Panel B: Ten-year moving average



Appendix Table 1: ASEC (CPS) occupations over time

| Occupation | Years | Code | Definition |
|---|---|---|---|
| Teacher | 1992-2002 | 155 | Teachers, prekindergarten and kindergarten |
| | | 156 | Teachers, elementary school |
| | | 157 | Teachers, secondary school |
| | | 158 | Teachers, special education |
| | | 159 | Teachers, not elsewhere classified |
| | 2003-2018 | 2300 | Preschool and kindergarten teachers |
| | | 2310 | Elementary and middle school teachers |
| | | 2320 | Secondary school teachers |
| | | 2330 | Special education teachers |
| | | 2340 | Other teacher and instructors |
| Nurse | 1992-2002 | 95 | Registered nurses |
| | | 207 | Licensed practical nurses |
| | 2003-2010 | 3130 | Registered nurses |
| | | 3500 | Licensed practical and licensed vocational nurses |
| | 2011-2018 | 3255 | Registered nurses |
| | | 3500 | Licensed practical and licensed vocational nurses |
| Social worker | 1992-2002 | 174 | Social workers |
| | 2003-2018 | 2010 | Social workers |
| Accountant | 1992-2002 | 23 | Accountants and auditors |
| | 2003-2018 | 800 | Accountants and auditors |

Appendix Table 2: Descriptive statistics, 1992-1996 and 2014-2018

| Variable | 1992-1996 | | | | 2014-2018 | | | |
|---|---|---|---|---|---|---|---|---|
| | T | N | S | A | T | N | S | A |
| Attrition | 7.6 | 8.8 | 14.9 | 8.4 | 7.1 | 7.5 | 13.4 | 6.2 |
| Age | 41.6 | 39.7 | 39.0 | 37.6 | 42.2 | 42.3 | 42.2 | 41.8 |
| Female | 75.1 | 93.3 | 70.4 | 43.2 | 76.5 | 90.0 | 83.6 | 56.9 |
| Black | 7.6 | 8.3 | 17.8 | 6.6 | 9.0 | 11.8 | 22.6 | 8.5 |
| Married | 71.7 | 68.9 | 57.8 | 65.3 | 68.3 | 65.5 | 55.8 | 63.2 |
| Separated or divorced | 10.0 | 12.6 | 14.9 | 8.0 | 9.5 | 12.3 | 15.0 | 9.7 |
| Advanced degree | 1.4 | 1.9 | 1.3 | .8 | 1.1 | 1.8 | 1.7 | 1.1 |
| Young child in household | 41.4 | 17.1 | 40.2 | 20.0 | 50.5 | 16.5 | 49.4 | 26.8 |
| <10 employees | 14.2 | 21.5 | 15.4 | 19.9 | 16.9 | 16.1 | 15.7 | 14.6 |
| 10-24 employees | 4.0 | 3.0 | 7.7 | 17.9 | 4.7 | 2.2 | 4.5 | 14.3 |
| 25-99 employees | 16.4 | 10.8 | 16.1 | 18.8 | 15.1 | 9.8 | 18.4 | 21.5 |
| 100-499 employees | 21.6 | 19.0 | 16.2 | 11.8 | 17.0 | 13.1 | 17.3 | 14.8 |
| 500-999 employees | 11.2 | 14.4 | 7.9 | 5.0 | 8.5 | 9.8 | 5.9 | 5.2 |
| 1000 or more employees | 46.8 | 52.9 | 52.1 | 46.5 | 54.7 | 65.1 | 53.8 | 44.2 |
| Average weekly earnings | 480.0 | 568.1 | 432.0 | 631.7 | 496.9 | 632.6 | 489.0 | 777.9 |
| Has health insurance | 96.6 | 96.6 | 96.0 | 95.3 | 78.6 | 79.1 | 78.0 | 77.2 |
| Insurance from employer | 90.7 | 90.6 | 90.3 | 86.4 | 86.7 | 88.2 | 88.6 | 84.5 |
| Enrolled in pension plan | 76.8 | 64.0 | 66.1 | 60.3 | 64.5 | 57.2 | 55.8 | 50.2 |
| Sample size | 10,958 | 2,789 | 1,306 | 2,683 | 15,883 | 5,949 | 1,839 | 3,693 |

*Notes:* T is Teachers, N is Nurses, S is Social workers, and A is Accountants. Attrition occurs if a respondent's occupation last week differs from the longest-held job in the past year. The data source is the Annual Social and Economic Supplement of the Current Population Survey (CPS). The sample is restricted to college graduates from 21 to 64 years of age. Means are weighted by person weights in the CPS.

# Appendix Figure Captions

Appendix Figure 1: The graphs show attrition rates over time in which the number of years of pooled data varies. The data source is the Annual Social and Economic Supplement of the Current Population Survey (CPS). The sample is restricted to college graduates from 21 to 64 years of age. Means are weighted by person weights in the CPS.

Appendix Figure 2: Panels A and B show teacher attrition rates by age group and sex for all separators in 1996 and 2018, which are calculated using pooled data from 1992 to 1996 and 2014 to 2018 respectively. Panels C and D restrict the separation type to teachers who leave the labor force. The data source is the Annual Social and Economic Supplement of the Current Population Survey (CPS). The sample is restricted to college graduates from 21 to 64 years of age. Means are weighted by person weights in the CPS.

Appendix Figure 3: The graphs show teacher attrition rates by census region, varying the number of years of pooled data across the panels. The data source is the Annual Social and Economic Supplement of the Current Population Survey (CPS). The sample is restricted to college graduates from 21 to 64 years of age. Means are weighted by person weights in the CPS.