Who Comes Back? A Longitudinal Analysis of the Re-Entry Behavior of Exiting Teachers

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ABSTRACT

While a large literature examines the factors that lead teachers to leave teaching, few studies have systematically examined what factors impact teachers' decisions to re-enter the profession after exiting. Drawing on research on the role of family characteristics in predicting teacher work behavior, we examine predictors of re-entry after a spell out. We employ survival analysis of time to re-entry for teachers who exit using longitudinal work data from the 1979 cohort of the National Longitudinal Surveys of Youth. We find that teachers who are younger, better paid and more experienced are more likely to re-enter. We also find that women are more likely to return to teaching than men. Child-rearing plays an important role in this difference. In particular, women are less likely to re-enter with young children in the home. We conclude that re-entrants may be an important source of teacher labor supply and that policies focused on the needs of teachers with young children may be effective means for districts to attract returning teachers.

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Because of the importance of attracting and retaining a high-quality teacher workforce for the success of public schools, researchers have developed a large literature on the teacher labor market (see Guarino, Santibañez, & Daley, 2006, for a review). A particular focus of this research has been on the factors that lead teachers to exit the teacher labor force (Borman & Dowling, 2009). Research on teacher attrition is motivated by concern about the high rates of turnover among teachers—approximately 7% of teachers leave the profession each year, with rates upward of 13% for new teachers (Grissom, 2011; Ingersoll, 2001)—and the high costs of finding suitable replacements, which analysis suggest average around 30% of the departing teacher's salary (Alliance for Excellent Education, 2005). An additional cost to schools from high teacher turnover is the loss of accumulated teacher human capital, since exiting teachers typically are replaced by teachers with less experience (Hanushek, Kain, & Rivkin, 2004).

It is surprising, then, that the literature has largely ignored a potentially significant source of teacher labor that presumably comes with lower search costs and results in smaller losses in teacher human capital: former teachers. In particular, little research has examined teachers' decisions to come back to teaching after a spell outside the profession. This oversight is especially noteworthy given an influential study by Flyer and Rosen (1997) that argued that, among college-educated professionals, teachers are peculiarly predisposed to re-entry because the structure of teacher pay via the uniform salary schedule ensures that they do not face large wage losses if they take time off. The flexibility this structure provides in turn attracts to the profession workers who are prone to take temporary leaves to, for example, raise small children, which, the authors suggest, helps explain why teaching is dominated by women.

This study helps fill a gap in the teacher work literature by analyzing teachers' propensities to return to the teaching profession after a spell outside of teaching using data that is longitudinal, national, and recent. The small body of previous work on this topic has been

limited to single-state studies, with the exception of Stinebrickner (2002), which reports on data from the 1970s. We conduct a more comprehensive analysis using the National Longitudinal Survey of Youth, 1979 cohort (NLSY79), which contains information on workers throughout the 1980s, 1990s and into the 2000s. We ask: what personal, work and family factors predict a teacher's decision to return to teaching after an exit? In particular, we ask whether there is support in the data for the hypotheses suggested by Flyer and Rosen (1997) that women are more likely to return than men and that child-rearing plays a role in re-entry decisions. We address these questions using survival models that allow examination of the timing of teacher re-entry with respect to changes in factors such as parenthood status and the age of children in the household. This analysis complements re-entry studies by Beaudin (1993, 1995), who drew on personnel data from the state of Michigan and thus was not able to consider the impact of family on teachers' decisions to return to work.

The next section describes prior work on the teacher labor market that drives our examination of re-entry. We then test the predictions derived from this research using data from the NLSY79. We conclude with a discussion of implications for policy and future work in this area.

Gender, Family and Teacher Mobility

A substantial body of research has investigated the labor market for teachers, with an emphasis on the factors that explain why teachers change schools or leave the profession altogether. This research has uncovered important associations between teacher attrition and many workplace-level determinants, including compensation levels (Baugh & Stone, 1982; Hanushek, Kain & Rivkin, 2004; Imazeki, 2004; Murnane & Olsen, 1989; Murnane & Olsen, 1990), school facilities (Loeb, Darling-Hammond, & Luczak, 2005), student demographics (Boyd et al., 2005; Shen, 1997), and support from administrators (Grissom, 2011; Ingersoll, 2001). Another strand of work has examined the role of teacher-specific factors, including

education level and certification status (see Guarino, Santibañez, & Daley, 2006, for a summary). In particular, this work has highlighted the important role that marriage and family considerations can play in teacher work decisions (Stinebrickner, 1998; Stinebrickner, 2001a; Stinebrickner, 2001b; Stinebrickner, 2002). These studies have found changes in home life, especially childbirth, to be strongly associated with teachers'—especially young female teachers'—decisions to exit.

The empirical finding that teachers are more likely to exit the profession when they have children is consistent with an economic model of occupation choice proposed by Flyer and Rosen (1997). Their model predicts that workers who expect to spend time out of the workforce in the future tend to choose occupations with both lower variance in wages and less depreciation in wages (due to lost human capital) during a temporary leave. They demonstrate that teaching has both of these characteristics. First, the uniform single salary schedule, which is employed in virtually all school districts in the United States, ensures that there is little variation in pay among teachers with similar levels of experience and education. Second, their analysis of teacher wage data shows that, unlike nurses and administrative support professionals—two other female-dominated professions they also analyze—teacher earnings growth is not affected by time out of the labor force, a result probably also due to the structure of compensation via the single salary schedule. Thus, forward-looking workers who expect that they will want to take time off from paid work during their careers—to rear children, for example—will be more likely to choose teaching than other professions that require a college degree. Given the role future child-rearing plays in their occupational choice, it is unsurprising that childbirth is associated with teacher exit (e.g., Stinebrickner, 1998).

Flyer and Rosen (1997) suggest that their model helps explain, in part, why teaching is dominated by women, who are overwhelmingly more likely than men to take time off from paid work to raise children. In fact, approximately 75% of the teaching workforce is female (Bacolod, 2007). It also helps explain why teachers are more likely than other college-educated

professionals to spend time out of the workforce; Flyer and Rosen (1997) find that female teachers spend 42% more time out of the labor force than other female workers with college degrees, on average. There are two other implications of the model related to teacher re-entry, however. The first is that women will be more likely return to teaching after a spell outside the profession, since they will have been more likely to have chosen teaching in anticipation of time off to raise children. The second is that, if large numbers of teachers leave the profession when they have children so that they can provide child care at home, we would expect that re-entry behavior would be negatively associated with having children younger than school-age. We address these two hypotheses in our empirical analysis.

Our analysis also considers other factors that might contribute to a teacher's decision to re-enter the teaching profession after a spell out. We build directly on the handful of studies that have examined re-entry, either descriptively or analytically. For example, Murnane et al. (1991) estimate the likelihood that a teacher in Michigan or North Carolina re-enters the profession within five years after leaving, and in both states estimate this probability at approximately 28 percent. They observe that re-entry probabilities were higher for women and elementary school teachers and lower among science teachers and teachers with high test scores, suggesting that those teachers may have greater opportunities in non-teaching fields. Beaudin (1993) similarly analyzes teacher re-entry using administrative data from Michigan schools in the mid-1970s. She finds that women are more likely to come back to teaching than men, though she attributes these differences to differences in subject matter specialty, since men tend to choose subject matter specialties (e.g., chemistry) with more opportunities in the non-teacher labor market. Using the same Michigan data, Beaudin (1995) finds that minority teachers and more experienced teachers at exit are more likely to return to the same district, as are teachers who leave higher-paying districts.

A small number of more recent descriptive studies also examine teacher re-entry. Using the National Longitudinal Survey of 1972, Stinebrickner (2002) finds that 33% of teachers who

could be observed for at least five years following an exit returned to the profession at some point during this period. Examining data from Washington, Plecki, Elfers, and Knapp (2006) estimate that 18% of teachers who entered teaching in 2000 but exited in 2001 re-entered in 2002. Using 35 years of data from Illinois, DeAngelis and Presley (2007) estimate that between one-fourth and one-third of new teachers who exit return to Illinois Public Schools at some point. The large numbers of teachers observed coming back into teaching following time away suggests that former teachers are an important source of teacher labor supply that policymakers might target for recruitment, particularly in school systems with elevated turnover rates. For this reason, it is important to understand what factors predict a teacher's decision to return to the teaching profession. It is this decision that we turn to in the next section.

Data and Methods

The analysis discussed below utilizes restricted, geocoded data from the National Longitudinal Surveys of Youth, 1979 cohort (NSLY79), which is managed by the Bureau of Labor Statistics (BLS). NLSY79 is a nationally representative sample of 12,686 men and women who were between the ages of 14 and 22 when the survey began in 1979. Respondents completed interviews on an annual basis until 1994, at which time interviews became biennial. These data have been used extensively to study work behavior across many occupations. We focus our analysis on the time period between 1980 and 2004.

We identified teachers in each year based Census code classifications of their current or most recent occupation and up to five other jobs using the weekly work history files. We counted a respondent as a teacher in a given year if the teacher reported working in an elementary, secondary, or other K-12 teaching job for any weeks during that year.[1] Pre-kindergarten teachers

[1] Sabbaticals present a difficulty in the NLSY79 work histories. According to NLSY79 documentation, for a time period in which a worker describes himself or herself as "associated with an employer but…not working for the employer," no job code is recorded; in this case, we code a teacher as "outside teaching" for those weeks. Because we code as "working in teaching" any worker who reports teaching work during a

were not included. This search resulted in 970 respondents who were teachers at some point in the study time frame. Of the respondents identified as ever having taught, 70% were female, which is very close to the fraction Bacolod (2007) reports in her analysis of teachers from the Baccalaureate and Beyond. In addition, 61% of NLSY79 teachers were white, while 21% were black and 18% were Hispanic.[2]

After dropping teachers with missing information,[3] we identify 341 spells in teaching that end in an exit of at least one year. We allow teachers who enter and exit teaching multiple times to appear more than once; the 341 spells cover 268 unique teachers.[4] Of these 341 exits, 175, or 51%, return after a minimum of one year outside the profession. Much of our analysis centers on this subset of 175 teaching spells, particularly in comparison to the 166 spells (49%) in which the teacher exits and is never observed returning.

Besides occupation, race, and gender, we utilize a number of other measures from NLSY79 in the analyses that follow. These include age, location, educational attainment, and income. We use standardized scores from the Armed Services Vocational Aptitude Battery (ASVAB), administered to a large subset of participants in 1980, as a proxy for intellectual

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year, only sabbaticals spanning a full year or longer are coded as "outside teaching" in the analysis data file.

[2] NLSY79 contains an over-sample of black and Hispanic respondents. Applying sampling weights reduces the estimates of the percentages of black and Hispanic teachers in the population to 11% and 6%, respectively.

[3] Data in NLSY79 cover approximately 302 teachers (not spells) who exit teaching during the data panel. Missing data on the set of variables in the most basic model in the paper (shown in column 1 of Table 2) necessitates dropping 34 of these teachers, or 11%. Eighteen of these lost teachers are dropped because of missing county of residence information, which prevented us from coding the *changed residence* variable. The main results were not sensitive to dropping this variable and including these teachers. Adding the job characteristics variables (e.g., hourly pay) drops an additional 16 teachers; adding the child variables results in no additional losses. We tested (using simple *t*-tests) for differences in observables between the original 302 teachers and the smallest analytic sample (from the models with background, job, and child variables, as in column 3 of Table 2). While basic background characteristics (e.g., gender, race ASVAB score, family income, grade level taught, location) showed no statistically significant differences, one potentially important difference did emerge. Because missing data becomes more problematic as the NLSY cohort ages, the analytic sample tends to draw more heavily from earlier years of data. Thus, the analytic sample was statistically younger at exit (by 2.2 years, on average) and less likely to be married. They were also more likely to have younger children and less likely to have older children (though not statistically different in total children), presumably because earlier years of data cover a greater proportion of likely child-bearing years.

[4] We cluster our analyses at the teacher level to account for the correlated errors this structure produces.

ability. We also include measures of work experience and compensation and characteristics of the local labor market. Additionally, we draw on data on marriage and fertility to include measures of marital status and the ages of respondents' children.

Analytical Strategy

To identify the factors that contribute to teachers' decisions to come back to teaching after some time out, we employ a survival analysis that models former teachers' spells out of teaching. We utilize the standard Cox proportional hazard model, which in this case estimates the probability that a person returns to teaching in a given year conditional on not having returned in the previous year. Multiple prior studies have used this framework to study teachers' decisions to leave teaching (Murnane et al., 1991; Stinebrickner, 1998); here we extend its use to the modeling of time to re-entry. The proportional hazard model allows us to consider the impact of both time-varying and time-invariant characteristics, as well as to take into account censoring of observations. Tests indicated that all models presented in the paper passed standard tests for the proportional hazards assumption.[5] Stinebrickner (1998) offers a description of the maximum likelihood procedure used to estimate these models.

To model spells out of teaching, we begin with the sample of former teachers who indicate that they are not teaching at time *t* but who were observed teaching in the previous year. In other words, it is at time *t* that a former teacher becomes "at risk" for re-entry. If at some time *T* we observe the teacher returning to teaching, we code the teacher as "failing" in that year. If time *T* never arrives by the time we stop observing former teachers, that respondent is considered right-censored. The hazard model we estimate analyzes the time from *t* to *T*. Under the assumption that censoring is random and unrelated to failure, censoring is easily accommodated by excluding censored observations from the likelihood function after the time

[5] These tests are based on the Schoenfeld residuals and were implemented as discussed in Cleves et al. (2008).

period that they are last observed. We include in our analysis former teachers both who are working other jobs and who are out of the labor force.

Our main estimates model a former teacher's time to re-entry as a function of gender, race (black or Hispanic, with white omitted), standardized ASVAB score, school type at time of exit (elementary or secondary, with other omitted), whether the teacher has a postgraduate degree (proxied by whether they report 18 or more years of education) at exit, and age at exit. We also include an indicator for whether the spell of teaching is not the first such spell observed.[6] All of these are time-invariant. We also include total family income and marital status (married or not), plus indicators for Census region of residence (Northeast, Midwest or South, with West omitted), urban location, and whether the subject changed county of residence in a given year, all of which can change during the spell outside the workforce.

In a second set of models, we add in work-related factors. The first is hourly pay at time of exit, which we include under the expectation that better-paid teachers will have stronger incentives to return to teaching jobs. We also include years of teaching experience at time of exit and an indicator for being part-time at exit (i.e., worked fewer than 35 hours per week), which capture investment in and attachment to the teaching profession. Finally, we include the local unemployment rate as a proxy for alternative employment opportunities in the area.

A third set of models adds variables related to child-rearing. Following Gramm (1975), we create a series of dummy variables for having children within a series of age brackets. The first three are 0-2 years, 3-4 years, and 5-6 years. We separate early childhood into these three groups to test for the possibility of differential re-entry behavior from teachers as care demands change as children move through very early childhood, preschool age, and the age of school entry. We separate the remaining age brackets into 7-11 years (roughly, elementary age), 12-17 years (middle and high school age), and 18 and higher (adulthood). Because work behavior is

[6] Most of these higher spells (75%) are second spells. There are 18 third spells (23%) and 2 fourth spells (2%).

likely affected by the total number of dependents for whom workers must provide, we also include a measure of the worker's total number of children (aged 0 to 17).

Family income and hourly wage were both converted to real terms ($2006) based on the annual Consumer Price Index for U.S. cities provided by BLS. All models are limited to teachers who report at least 16 years of education, which we use as a proxy for holding a Bachelor's degree, since degree information is not available. We further limit the sample to teachers who report at least 20 hours teaching per week at time of exit at an hourly wage above the 5th percentile (approximately $3.50 per hour, in 2006 dollars). These limits were used to avoid including non-traditional teachers or teachers reporting incorrect data. Sampling weights provided by BLS are employed in all analyses.

Results

We begin our analysis by providing some basic information on the teachers in our sample. The first two columns of Table 1 provide descriptive statistics for exiting teacher spells in our sample, i.e., those in which a teacher becomes eligible to re-enter teaching. It shows that the sample is approximately two-thirds female with an average age of 29 and average teaching experience of 3.5 years. Twenty-five percent of exiters have a child aged 0 to 4 years. Note that this sample will not be representative of all exiting teachers because we observe NLSY79 teachers relatively early in their work careers. Descriptive information about all teachers we observe working in the NLSY79 data is shown in Appendix Table 1.[7]

The remaining columns of Table 1 separate the exiting teacher spells into two groups: those that will later result in re-entry and those that will not. Descriptive statistics are then shown for characteristics at time of exit. Asterisks in the column of means in the *will not return* group indicate statistically significant differences (in two-sided *t*-tests) between the two. This

[7] Compared to all teachers in the sample, exiting teachers are approximately 3 years younger with 2 fewer years of teaching experience. Exiters are also less likely to be female than are the working teachers in the sample.

comparison provides a first look at how re-entrants to the teaching profession may differ from those who do not. Though there are no differences with respect to race or ASVAB score, re-entrants are more likely to be women and less likely to be married. They are more likely to teach in elementary schools and less likely to have education beyond a bachelor's degree. They are also about two years younger at time of exit, on average, though they also have about half a year more teaching experience. They are less likely to be part-time and work in places with higher unemployment rates. Additionally, the table shows that teachers not in their first spell out—i.e., those who have left and returned before—are more likely to return again. There are also a few differences with respect to the child variables. In particular, though there is no significant difference in the total number of children, teachers who will later re-enter tend to have somewhat younger children at time of exit, on average.

Next we consider time to re-entry. Figure 1 shows the proportion of teachers in the sample who re-enter the teaching profession *T* years after exiting, conditional on ever coming back at all. As the figure illustrates, 48% of these teachers return after just a one-year spell outside the profession. This fraction is comparable to what Murnane et al. (1991) observed in North Carolina and Michigan in their analysis of earlier data. In each subsequent year out of teaching, the likelihood of returning falls dramatically; 67% of re-entrants do so in year 1 or year 2, and only 14% return after year 5.

The pattern shown in Figure 1 can also be illustrated using the plot of the Kaplan-Meier survivor function for time to re-entry shown in Figure 2. This line again shows that the probability of returning ("failing") falls significantly each year that a person is away from teaching, particularly in the first three years. The value of the survival function in year 10 is 0.46, which means that approximately half of exiting teachers are predicted to re-enter by their tenth year out, though it changes very little thereafter, suggesting that few additional teachers are likely to re-enter if they haven't done so by year 10. Note, however, that beyond about year

10, we observe so few teachers re-entering the profession in our data (and none after year 14) that our estimates will be imprecise.

A primary hypothesis investigated in this paper is that women return to the teaching profession after a spell out at higher rates than men. Figure 3 compares time to re-entry for men and women by plotting their respective Kaplan-Meier survival functions. A Cox test of equality for the two curves rejects the null hypothesis that they are the same (p = 0.02). The figure shows that women are much more likely than men to re-enter the teaching workforce after one year, and that this gap persists in every time period. By the fifth year after exit, the difference in the predicted survival probabilities for men and women is approximately 14 percentage points. In the longer run (10 or more years), men are even more likely to persist outside of teaching than women. This pattern of women returning at higher rates than men is consistent with the Flyer and Rosen (1997) hypothesis that teaching attracts women in part because re-entry (after childbirth or childrearing) to teaching has lower wage penalties than in other professions. We investigate the degree to which re-entry decisions are a function of both gender and fertility in the multivariate analysis in the next section.

Modeling Time to Re-Entry

The main question we investigate is: *What factors underlie a teacher's probability of returning to the teaching profession following a break?* Finding the answer to this question requires us to consider teachers' re-entry decisions in a multivariate framework. Here we use Cox regression to model a teacher's time away from the profession as a function of personal, work and family characteristics as a step toward more rigorously identifying the most important mechanisms underlying the decision to re-enter or not.

Table 2 shows Cox proportional hazard estimates for time to re-entry for all exiting teachers. The coefficients have been exponentiated so that they can be interpreted as the ratio of the hazards for a one-unit change in each explanatory variable. Hazard ratios significantly

greater than 1 suggest that a variable is associated with greater re-entry, while hazard ratios significantly smaller than 1 suggest a negative association with re-entry.

Model 1 includes personal characteristics such as gender, race, marital status and teaching level. The primary variable of interest in this model is the first one, the indicator for whether the teacher is female. The coefficient is significant at the 0.10-level, and its magnitude suggests that women have a hazard (risk of re-entry) that is 42% greater than that for men, conditional on the other variables in the model. This finding is consistent with the patterns observed in Figure 3.

The second model in Table 2 adds four variables capturing characteristics of the teacher's work context: hourly pay, whether the teacher works part-time and number of years of teaching experience at time of exit, plus the local unemployment rate. In this model, the coefficient on female drops somewhat and becomes statistically indistinguishable from zero at conventional levels, a result that persists in model 3 when the variables related to children in the home are added. These findings suggest that while women indeed are more likely to return to teaching than men, this difference is driven—at least in part—by differences by gender in the impact of work and family factors on work decisions. We return to differences in the re-entry decision by gender below.

Besides the results concerning gender, Table 2 provides insight into the factors influencing a former teacher's decision to return to teaching more generally. We focus on model 3. This model shows no statistically significant correlations between race, ASVAB score, or marital status and the probability of returning to teaching. It also shows no impact of schooling level taught, though looking across models 1 through 3 suggests that, in general, elementary teachers are more likely to return—a finding consistent with Beaudin (1993)—but these differences are driven by differences in pay and other factors across grade level. Results also show that returning teachers tend to come from families with lower overall incomes. This coefficient suggests that teachers from more well-off families may have greater flexibility to not

work or to seek employment elsewhere. Having some postgraduate education at time of exit generally is associated with a lower probability of returning to teaching, though this coefficient is not statistically significant at conventional levels in Model 3 (p = 0.12). Teachers with greater education levels may have a larger number of higher-paying alternatives in the non-teacher labor market.

The models reach one conclusion that is inconsistent with results presented in Beaudin (1993), namely that being older at time of exit is associated with a lower probability of returning. In Beaudin's analysis of data from Michigan, the estimated probability of returning increased substantially as age at exit increased, but the opposite is true in our data, with each additional year reducing the probability that we observe a teacher returning. One explanation for the discrepancy between the two studies is that they are based on different data sets (Michigan vs. national) covering two different time periods. Another is that because the NLSY79 is a cohort study, older teachers who exit in our data necessarily are observed in fewer time periods in which they might return, lowering their calculated probabilities. Analysis using a longer time span may find a result more consistent with Beaudin's (1993) finding.

Like Beaudin, however, we do find that more experienced teachers at time of exit tend to return at higher rates, suggesting that teachers who have invested more in building teaching-specific capital are more likely to return after time away. Similarly, part-time teachers are less likely to return. Teachers who are paid higher hourly wages at exit are also more likely to return to teaching. Importantly, this coefficient is conditioned on experience and education, the two primary determinants of a teacher's position on the single salary schedule, suggesting that the coefficient on pay is capturing actual differences on re-entry probability of a how well a school district compensates its teachers.

Additionally, Table 2 shows that teachers are more likely to re-enter when they have already exited and returned previously, with teachers on their second (or more) spell out of teaching showing a hazard rate approximately 60% higher than those on their first spell out.

Repeat leavers likely differ from single-leavers in important ways. In particular, we might suspect that repeat leavers are people who are attached to the teaching workforce but face personal circumstances, such as dependent care, that pull them away, whereas single-leavers might be more likely to be career-switchers, an issue to which we return later. In fact, while 80% of teachers re-entering from a single spell out had worked at some point in another job, for teachers returning from a subsequent spell, this number was only 65%, a statistically significant difference (p = 0.07).[8]

The final set of variables in model 3 is concerned with the characteristics of the children in the home.[9] This is where we return to the hypothesis implied by the Flyer and Rosen (1997) study that teachers' re-entry decisions will be impacted by child-rearing considerations. The hazard ratios are consistent with Flyer and Rosen's predictions. The hazard ratio for the total number of minor children (age 0-17) is greater than one. Each additional child in the home is associated with an increase in the hazard rate for returning to teaching of 0.67 (p = 0.02). However, the presence in the household of children age 2 or younger is a strong negative predictor of re-entry into teaching (hazard ratio = 0.37, $p < 0.01$). The presence of a child in the next age group (3-4 years) is also a negative predictor, though the magnitude of the coefficient is smaller than for younger children (hazard ratio = 0.45, p = 0.012).[10] The coefficient for children age 5 or 6 is also less than one though not statistically significant (p = 0.13). None of the

[8] Subsequent spells do not appear to drive the paper's results concerning the presence of young children. Splitting the sample into first and subsequent spells out yields very similar hazard ratios for the two youngest groupings.

[9] Because missing data result in loss of sample size, we used an imputation procedure based on chained equations (van Buuren, Brand, Groothuis, and Rubin 2006) to impute values for the three variables in the analysis whose missing values resulted in the largest reductions of sample size: hourly pay at exit, family income, and whether a respondent moved. This imputation allowed us to add information from 35 teachers to the estimates shown in column 3; however, the conclusions drawn from the analysis remained largely unchanged, so the paper presents the un-imputed results. With imputation, the hazard ratio on postgraduate education became significant at the 0.05 level, while family income became statistically insignificant (p = 0.18).

[10] The null hypothesis that the coefficients for 0-2 years and 3-4 years are equal cannot be rejected (p = 0.65).

coefficients for the higher age brackets approach statistical significance.[11] In short, these coefficients provide evidence that teachers with very young children (i.e., younger than school-aged) are less likely to return to teaching, while the presence of older children (i.e., school-aged or above) shows no clear relationship with teachers' work decisions.[12]

Examining Time to Re-Entry by Gender

The Flyer and Rosen (1997) hypothesis, however, implies differential implications of child-rearing for the work decisions of men and women. To provide a closer look at the gender dynamics of teacher re-entry, we next re-estimate the Cox regression models separately for women and men. Splitting the sample in this way allows us to identify differential impacts by gender of other variables in the model. The results of re-estimating the models by gender are displayed in Table 3. Only the full models are shown.

The results uncover a number of differences for women and men. For example, the table suggests that the associations between re-entry and age at exit, multiple spells, and hourly pay are all driven by differences for women, not men. The table also shows that, once women and

[11] To test the robustness of this main result to the specification of the child variables, we ran a number of alternative models. First, we dropped the variable for the total number of children but included the age bracket variables. The hazard ratios among the age brackets changed, though the patterns did not. However, only the 0-2 age bracket was statistically significant in this model. We also ran models that substituted the *number* of children in each age bracket rather than a simple indicator for the presence of any children. Using the same age groupings as in Table 2, we found, as expected, negative correlations with re-entry for having more younger children in the home and positive correlations with having older children, but only the coefficient on "number aged 12-17" was statistically significant. If instead we reduced the number of age groupings to two ("number aged 0-4" and "number aged 5-17"), the two hazard ratios remain consistent with the results in Table 2 but are not precisely estimated, with *p*-values each of approximately 0.18. A possible interpretation of these results is that the relationship between the presence of young children and teacher re-entry contains a non-linearity; what matters for the re-entry decision is the presence of a young child in the home, but conditional on there being one, additional young children matter much less, though we would need more data to assess this conjecture.

[12] We also tried estimating the models using a fixed effects logit estimator (where the dependent variable was the probability of re-entering in a given time period) instead of the Cox proportional hazard model. The main drawback of this approach relative to survival analysis is that it throws out information for censored data. It also prevents analysis of the contribution of time-invariant characteristics. Thus, we only included time-varying characteristics in these models and let the others be absorbed by the fixed effect. For the 95 individuals in these models (observed over 504 time periods), the results on the child age variables was consistent with the results from the survival analysis, with odds ratios for having a child aged 0-2 and aged 3-4 of 0.20 and 0.34, respectively. Both were statistically significant (at the 0.05 and 0.10 levels, respectively). Other child age variables were not statistically distinguishable from zero.

men are disaggregated, there is a significant positive association between men's ASVAB score and the probability of re-entry. In contrast, the effects of years of teaching experience are very similar and statistically significant in both the female and male samples.

More striking, however, are the results for marriage and parenthood. The impact of being married on re-entering teaching is statistically significant at the 0.05 level for both women and men, but the direction of the association differs. For women, marriage is positively associated with re-entry. Married women have a 50% higher re-entry hazard than unmarried women. In contrast, for men, marriage is associated with a lower likelihood of returning to teaching. Married men have a 66% lower re-entry hazard than unmarried men.

Turning to the child variables, we find that the positive association between re-entry and total number of children and the negative association with the presence of a very young child (age 0-2 or 3-4) is statistically significant for women only. The latter result in particular is consistent with the Stinebrickner (1998) finding that women appear to leave teaching at high rates to have and take care of children. None of the child variables are statistically significant for men, providing little evidence that men experience re-entry pressures from childrearing—perhaps because, as Stinebrickner (1998) shows, the man's decision to exit teaching is not a function of this variable either. We note, however, that the smaller sample sizes for the male estimates and the resulting imprecision prevent us from ruling out the possibility that young children may matter for men. Still, the results support the idea that prior work observing that households treat men's and women's work options differently has implications for the dynamics of the teacher workforce.[13]

[13] In light of the differential findings regarding marriage and children for women and men, we also ran analyses interacting the indicator variable for *married* with the indicators for each child age bracket to test for the possibility that the impact of children on re-entry would be conditional on marital status. This conditional relationship would be expected if, for example, married workers had greater freedom to stay home with small children because a spouse could work. This analysis could only be completed for women because of limited variation with which to estimate the interactions in the male-only sample, but the results suggest that the negative association between the presence of children age 0 to 4 in the home and re-entry is concentrated among married women. In particular, the hazard rations for the interactions

Working While Out of Teaching

Exiting teachers can either leave the paid workforce altogether or remain in the workforce but enter another profession. Thus far we have treated these two possibilities as equivalent, but clearly they are different and likely have different implications for the likelihood that a former teacher re-enters the profession at a later date. Entering another profession may signal that the teacher wants to work in the paid labor force but is seeking more attractive job opportunities. In this case, we would expect re-entry to become less likely. In contrast, teachers who simply remain out of the labor force may be those facing other considerations, such as illness or—as we have discussed—the need to care for dependents, which, if transitory, may allow the teacher to return in the future. In short, we would expect to find that teachers who hold no non-teaching employment during their spell out of the teaching profession would be more likely to return to teaching.[14] Moreover, if, as we have argued, the re-entry propensity of exiting teachers—and female teachers in particular—is lowered by the presence of young children in the home because teachers tend to elect to provide child care when the children are pre-school-aged, we would expect to see the effects of young children on re-entry to be greater among those teachers who are not in the labor force at all during their time outside teaching.

To examine these expectations within the Cox model used in the previous analyses, we first created an indicator variable that we set equal to 1 for any teacher who held no other paid employment in any year during his or her spell outside teaching (and 0 otherwise). We then re-estimated the full model from Table 2, adding this indicator. The result, shown in column 1 of

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between *married* and both the 0-2 and 3-4 age bracket were substantially lower than zero, and the hypothesis that they were jointly zero could be rejected in a Wald test at the 0.10 level.

[14] In fact, we might think of entering alternative employment as a "competing risk" for returning to teaching and model the decision to re-enter accordingly in a competing risks framework that allows for multiple "failures" (i.e., returning to teaching or entering another job). Descriptively, however, it would not appear that having non-teaching employment necessarily precludes returning to teaching in our data. Approximately 75% of the spells out of teaching that end in re-entry include at least one year with some paid work in another sector. Thus, instead of utilizing a competing risks model, we attempt to incorporate work in other employment into the standard Cox framework in Table 4.

Table 4, confirms the expectation of a positive and significant coefficient. Holding no other job while outside teaching is highly predictive of returning to the teacher work force, with teachers holding no other employment displaying a hazard that is 80% higher than teachers who hold another job at some point ($p < 0.01$).

To test the assertion that staying home to provide child care drives the relationship between the presence of young children and re-entry to teaching, we next interacted the *no employment* indicator with each of the child age bracket indicators. If the assertion is true, we would expect to see significant (and negative) coefficients on the interaction terms for the younger age brackets in particular. The results are shown in column 2 of Table 4.[15] A Wald test of the null hypothesis that all of the interaction terms are jointly zero can be rejected at the 0.05 level. Though none are individually significant due to high collinearity between the interactions and other variables, the hazard ratios for the interactions are consistent with the idea that the presence of young children reduces the re-entry likelihood more for teachers who do not work while out and, moreover, that the re-entry propensity is *positive* in the presence of children aged 5 or 6 (i.e., school-age children).

This pattern becomes more pronounced when we limit the sample to women only in columns 3 and 4 in Table 4 (there are too few men to obtain coefficients for the interactions in the male-only subsample).[16] Once again, the indicator for holding no other employment during the spell out is positive and statistically significant. The interaction terms are also jointly significant ($p = 0.05$). The hazard ratios for the interactions suggest that women with very young children (age 0 to 4) are less likely to return when they are out of the labor force but significantly more likely to return in the presence of a school-aged (5-6) child. The hazard ratio on the 5-6 age bracket is very large (6.7) and individually significant at the 0.05 level. In other words, among female teachers who have left the paid labor force altogether, we find evidence of lower

[15] There was too little variation to include the interaction between *no employment* and the "18 or older" age bracket.
[16] Though note that the *no employment* hazard ratio is also positive (2.1) and significant at the 0.10 level when the interaction terms are not included.

likelihoods of returning when the children are very young but greater likelihoods when they reach the age at which child care inside the home is no longer necessary.

Discussion and Conclusions

The results presented here uncover several new insights into teacher labor market behavior. First, rates of re-entry are non-trivial. More than 40% of teaching spells that terminate in our sample lead to subsequent re-entry. While the cohort nature of the sample, which is made up of relatively young teachers, makes this re-entry percentage not necessarily representative of all exiting teachers, the fraction is large enough to suggest that teacher labor market analyses that do not consider re-entry are incomplete. Attrition rates in teaching average 7–8% each year (Ingersoll, 2001), but some of the loss to the teacher labor supply these numbers presume is offset by re-entry among former teachers. Moreover, high rates of re-entry suggest that the school system recoups a significant portion of the human capital loss associated with teacher attrition.[17]

Second, consistent with the expectations derived from Flyer and Rosen (1997), teacher re-entry behavior appears to be driven significantly by teachers' family characteristics, especially for women. We find evidence of a pattern of women staying home with young children and then—at least among those working in no other employment—shifting back into the teaching workforce when their children reach school age, an important empirical fact that other studies have hypothesized but not shown. In contrast, we find little evidence that these considerations impact male teachers' work decisions.[18]

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[17] Though short-term attrition may reduce important firm- (i.e., school-) specific capital (e.g., understanding the school's community, relationships with fellow teachers), it is unlikely to similarly affect "general" teaching capital (e.g., knowledge of teaching practices) as understood in the human capital literature (see Becker, 1993). We thank an anonymous reviewer for making this point.

[18] As described earlier, Flyer and Rosen's (1997) argument that the characteristics of teacher compensation create teacher labor market dynamics that differ from those of other female-dominated professions provides the basis for our examination of teacher re-entry. A natural hypothesis, then, is that teachers' re-entry behaviors differ from those of other female-dominated professions as well. While a

How important is the role of child-rearing in female teachers' propensity to come back to teaching? In our sample, 14% of female teachers who exit have newborns (age 0 or 1) in the year they exit, compared to only 9% of men. Two years later, 14% of women who have not returned have newborns in the home, compared to just 5% of the women who do return in that year. Five years after exit, 22% of women who have not returned have newborns, while *none* of the women who return at year five do.[19] This is not to say, however, that women staying home to care for young children are the primary driver of teacher turnover, even in our sample of relatively young female teachers. One year after exiting teaching, 66% of women (and 75% of men) report working in other paid employment, a number nearly identical to the estimate of women who are working one year after leaving teaching (62%) in the 2004-05 Teacher Follow-up Survey (TFS) conducted by the National Center for Education Statistics.[20] In other words, both women and men leave teaching for other paid employment in large numbers. Still, the size of the pool of former teachers who are not engaging in paid work outside the home is substantial, particularly among women, and child and family considerations appear to be important in their employment decisions.

These results have a number of potential policy implications. First, they underscore that former teachers may be a significant source of teacher labor supply. In our sample, the average re-entrant has nearly five years of prior teaching experience. Given the substantial gains in effectiveness teachers make during their first four or five years in the classroom (Rivkin,

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complete examination of that hypothesis is beyond the scope of this paper, we did use the NLSY79 cohort to compare re-entry characteristics for teachers to those of nurses and social workers, two professions that, like teaching, employ predominantly female, highly educated workers. These comparisons are shown in Appendix Tables 1 and 2. The tables show that although probabilities of exit are similar for teachers and nurses, they are much higher for social workers (Appendix Table 1). In contrast, although the probabilities of returning are similar for teachers and social workers, they are higher for nurses (Appendix Table 2). Also re-entering teachers fall between the other two in the probability that a re-entering worker has small children in the home. These results call into question whether teachers are in fact very different from professions in other female-dominated fields, though further investigation obviously is necessary.

[19] Admittedly, only five women return to teaching at year five, so this number is not meant to be representative.

[20] Source: author calculations. This estimate is based on responses from public school teachers younger than age 47, which is the maximum age observed in our NLSY79 sample.

Hanushek, & Kain, 2005), there may be significant payoffs to schools who can attract former teachers to fill vacancies, particularly when the alternative is to hire a first-year teacher. Workers who return to teaching typically exited with higher salaries than non-returners, suggesting that increasing teacher pay may be one strategy for enticing former teachers to return to the profession.[21] At a minimum, our findings suggest that schools might benefit from maintaining contact with teachers who take time out, especially when those spells are fertility-related, since it appears that some proportion of these exiting teachers could be lured back into those schools when their home situation changes.

The importance of having young children at home in explaining the length of teachers' spells out of the profession suggests another avenue of policy strategies for attracting teachers to return—or perhaps even to prevent them from leaving in the first place—with which policymakers might experiment. Some young female teachers may be staying out of work to provide care to their young children because available child care options are expensive or inconvenient. Child care costs can be thought of as a kind of tax on teachers' earnings that lower effective wages, which research in labor economics has shown to negatively impact women's labor force participation (Anderson & Levine, 2000; Han & Waldfogel, 2001). School districts might combat this implicit tax and positively affect teachers' job attachment by offering teachers child care options. In fact, among former female teachers surveyed in TFS who said that they would consider a return to teaching, 32% reported that "availability of suitable childcare options" would be a very or extremely important factor in their decision to return. This fraction was even higher among younger women, totaling 57% among women age 40 or younger who

[21] Coupling our findings with the Flyer and Rosen (1997) argument about the role of the single salary schedule in attracting young women to teaching suggests implications for current debates about the reform of teacher salary schedules (e.g., Grissom & Strunk, 2011; Podgursky & Springer, 2007). In particular, districts might consider whether compensation reforms that make it more costly for teachers to take time off to have children will adversely affect the ability to hire new (and returning) teachers. In contrast, reforms that raise pay for early-career teachers may make teacher re-entry more likely.

would consider returning.[22] Schools would appear to be especially well-positioned to provide on-site child care at low costs because they can take advantage of the economies of scale associated with having facilities and personnel already specializing in providing care and educational services for children. Of course, our results are merely suggestive on this front; the question of whether child care assistance would in fact affect teachers' attrition or re-entry behaviors remains an open one.[23]

The findings also point out that the factors informing male and female teachers' work decisions are different, suggesting that districts need differentiated policy strategies for attracting and retaining male and female teachers. This insight is important given recent policy attention to the male teacher shortage (e.g., Cushman, 2005). While our results point to a number of factors that may affect female teachers' work decisions, our analysis was not successful at identifying many factors correlated with the re-entry decisions of male teachers in our sample. Further work with a larger sample of men and a larger number of potential influencing factors would be useful for policymakers interested in the labor market for male teachers.

Our analysis faces a number of limitations. Most importantly, because work environment variables are scarce in the NLSY79 data, we are unable to take school characteristics into account, which may be important considerations for teachers contemplating a return to work (Beaudin, 1995). Such data are common in state administrative data sets and other sources, such

[22] Source: author calculations. This estimate is based on responses from public school teachers younger than age 47, which is the maximum age observed in our NLSY79 sample.

[23] One might envision several strategies for identifying the causal effect of child care assistance on teacher work behavior. For example, teachers within participating districts (or all teachers within randomly chosen schools) might be randomly assigned the opportunity to receive subsidized child care, with their outcomes compared to non-recipients. A similar design was employed to study the impacts of the New Hope program in Milwaukee—a component of which was a child care subsidy—on employment among its participants, who were very low-income (see Duncan, Huston, & Weisner, 2007). We know of no such study for teachers or similarly situated professionals. More traction in the literature on the impacts of child care availability or subsidy on parental employment decisions has come from quasi-experimental approaches exploiting the features of particular programs to create treatment and control groups (e.g., Fitzpatrick, 2010; Lefebvre & Merrigan, 2008). Again, no studies of which we are aware apply such a research design to teacher child care.

as the Schools and Staffing Survey, which researchers use to study teacher work behavior. However, there is a key tradeoff involved in using administrative data, since those data sets typically do not contain information on important personal characteristics, such as marriage and fertility, which studies using longitudinal data have also found to be significant determinants of exit decisions. In the same way that sorting of teachers by school characteristics could mean that omitting those characteristics biases some of our coefficient estimates, excluding family characteristics may well have biased estimates of the impact of the work environment on re-entry decisions in previous work. The development of longitudinal data sets that combine both sets of elements would facilitate more complete studies of teacher labor markets.

We are also unable to consider a number of teacher-level factors that would be useful to investigate in future work. In particular, we lack access to measures of teacher quality or effectiveness. We cannot say whether more effective teachers are or less likely to return to the profession, or whether their work decisions are differentially affected by such factors as pay and child-rearing. Examination of the implications of our results for teacher quality would add clarity to the policy discussion that our analysis informs.

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APPENDIX TABLE 1: COMPARING TEACHERS TO OTHER PROFESSIONS

	Teachers (N = 2,556 subject-years)	**Nurses** (N = 659 subject-years)	**Exiting Nurses** (N = 107 exits)	**Social Workers** (N = 606 subject-years)	**Exiting Social Workers** (N = 197 exits)
Pr(exit in a given year)	0.16	0.16	--	0.33	--
Pr(ever return | exit)	0.51	0.60	--	0.44	--
Pr(return in a given year | exit, has child age 0-4)	0.08	0.18	--	0.07	--
Female	0.77	0.98	0.97	0.63	0.64
Black	0.08	0.08	0.04	0.18	0.20
Hispanic	0.04	0.04	0.04	0.06	0.07
Standardized ASVAB score	55.8	55.3	55.1	54.9	55.1
Married	0.61	0.60	0.63	0.54	0.57
Family income (in $1,000s)	81.3	91.3	115.3	72.1	64.8
Postgraduate education	0.27	0.16	0.13	0.29	0.23
Age	32.1	32.8	30.1	32.4	30.8
Hourly pay	16.2	24.7	21.3	17.4	15.9
Part-time	0.14	0.24	0.17	0.11	0.12
Years experience	5.76	6.02	4.28	4.15	2.94
Number of children (ages 0-17)	0.75	0.77	0.70	0.50	0.43
Has child age 0-2	0.16	0.19	0.23	0.11	0.11
Has child age 3-4	0.11	0.10	0.07	0.07	0.09
Has child age 5-6	0.09	0.10	0.09	0.07	0.07
Has child age 7-11	0.17	0.15	0.15	0.10	0.08
Has child age 12-17	0.11	0.10	0.05	0.07	0.03
Has child age 18+	0.04	0.04	0.03	0.04	0.02

Sampling weights used. Data for some variables missing for some observations. Means calculated over any a year a college degree-holding subject was observed working in the given profession at least 20 hours per week. Years experience indicates years of experience at exit in the third and fifth columns.

APPENDIX TABLE 2: COMPARING TEACHER RE-ENTRANTS TO RE-ENTRANTS IN OTHER PROFESSIONS

	Re-Entering Teachers (N = 175 re-entries)	**Re-Entering Nurses** (N = 77 re-entries)	**Re-Entering Social Workers** (N = 99 re-entries)
Female	0.72	1.00	0.69
Black	0.07	0.03	0.22
Hispanic	0.04	0.03	0.09
Standardized ASVAB score	56.6	55.3	55.4
Married	0.63	0.70	0.54
Family income (in $1,000s)	85.3	87.6	74.2
Postgraduate education	0.29	0.20	0.26
Age	32.7	31.7	32.3
Hourly pay	16.8	24.5	17.5
Part-time	0.15	0.31	0.13
Years experience (at exit)	4.88	4.86	4.10
Number of children (ages 0-17)	0.81	0.87	0.41
Has child age 0-2	0.17	0.26	0.13
Has child age 3-4	0.08	0.21	0.03
Has child age 5-6	0.09	0.04	0.07
Has child age 7-11	0.19	0.19	0.05
Has child age 12-17	0.11	0.06	0.08
Has child age 18+	0.02	0.02	0.03

Sampling weights used. Data for some variables missing for some observations. Means calculated in year of re-entry.

FIGURE 1: LENGTH OF SPELL OUT OF TEACHING (IN YEARS)

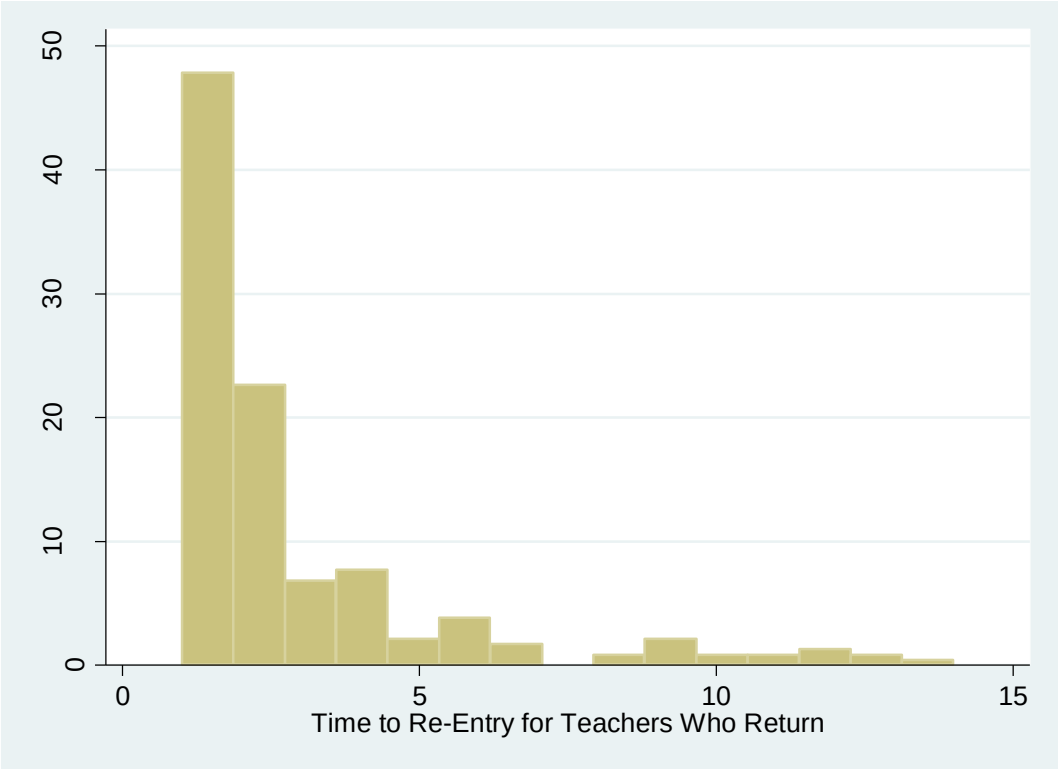

FIGURE 2: KAPLAN-MEIER SURVIVOR FUNCTION: TIME TO RE-ENTRY

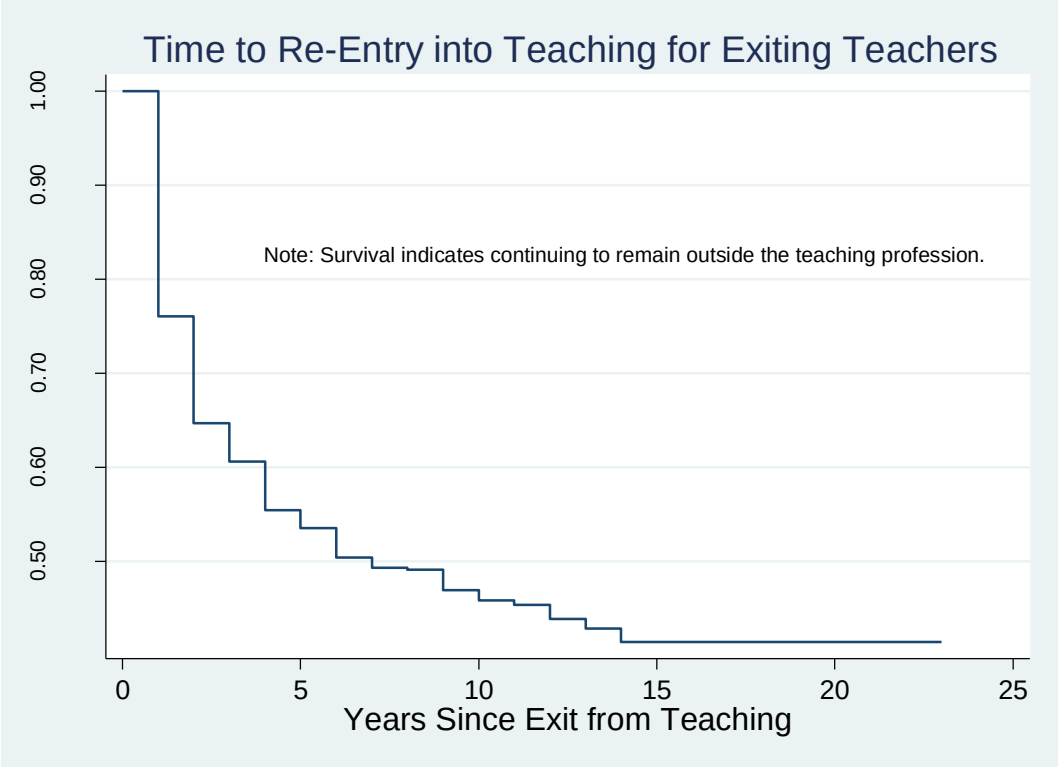

FIGURE 3: KAPLAN-MEIER SURVIVOR FUNCTION: TIME TO RE-ENTRY BY GENDER

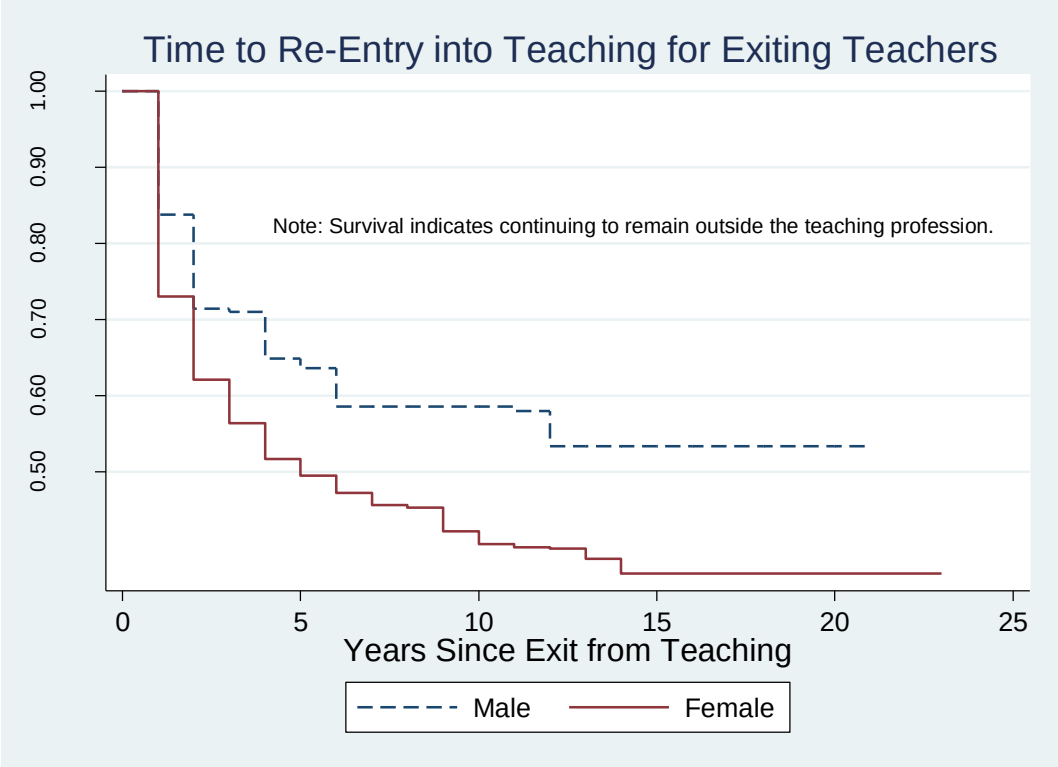

TABLE 1: DESCRIPTIVE STATISTICS

	All Exiting Teachers (N = 268 teachers in 341 spells out)		**Exiting Teachers Who Will Later Re-Enter** (N = 102 teachers in 175 spells out)		**Exiting Teachers Who Will Not Later Re-Enter** (N = 166 teachers in 166 spells out)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Female	0.66	0.47	0.74	0.44	0.59***	0.49
Black	0.09	0.28	0.08	0.27	0.09	0.29
Hispanic	0.03	0.17	0.04	0.19	0.02	0.15
Standardized ASVAB score	56.2	5.7	56.3	5.4	56.1	6.0
Married	0.53	0.50	0.47	0.50	0.59**	0.49
Family income (in $1,000s)	77.3	126.6	79.0	138.4	75.5	114.0
Elementary teacher	0.42	0.49	0.48	0.50	0.37**	0.48
Secondary teacher	0.18	0.39	0.19	0.39	0.18	0.38
Postgraduate education (at exit)	0.23	0.42	0.17	0.38	0.30***	0.46
Age (at exit)	29.0	4.5	27.9	3.7	30.2***	4.9
Urban	0.81	0.39	0.83	0.37	0.79	0.41
Northeast region	0.18	0.39	0.16	0.37	0.2	0.4
Midwest region	0.28	0.45	0.30	0.46	0.27	0.44
South region	0.36	0.48	0.35	0.48	0.37	0.48
Changed residence this year	0.16	0.37	0.15	0.36	0.16	0.37
Second (or more) spell out	0.30	0.46	0.34	0.48	0.25*	0.44
Hourly pay (at exit)	16.6	15.3	17.5	19.5	15.7	8.5
Part-time	0.25	0.43	0.19	0.39	0.31**	0.46
Years experience (at exit)	3.5	2.9	3.8	3.0	3.2*	2.8
Local unemployment rate	6.6	2.8	7.1	2.9	6.1**	2.6
Number of children (ages 0-17)	0.51	0.89	0.44	0.85	0.58	0.92
Has child age 0-2	0.17	0.37	0.16	0.37	0.17	0.38
Has child age 3-4	0.08	0.28	0.05	0.22	0.11**	0.32
Has child age 5-6	0.07	0.25	0.07	0.25	0.07	0.25
Has child age 7-11	0.09	0.29	0.08	0.28	0.10	0.30
Has child age 12-17	0.04	0.19	0.01	0.12	0.06**	0.23
Has child age 18+	0.01	0.12	0.01	0.04	0.03**	0.16

*Sampling weights used. Data for some variables missing for some observations. Asterisks indicate differences from teachers who will later re-enter. * 0.10, ** 0.05, *** 0.01.*

TABLE 2: COX REGRESSION OF TIME TO RE-ENTRY (ALL EXITING TEACHERS)

	(1)	(2)	(3)
Female	1.415*	1.252	1.338
	(0.281)	(0.267)	(0.298)
Black	0.923	1.023	0.884
	(0.329)	(0.295)	(0.260)
Hispanic	1.579*	1.329	1.275
	(0.378)	(0.388)	(0.381)
Standardized ASVAB score	1.010	1.006	1.008
	(0.016)	(0.018)	(0.018)
Married	0.837	1.081	1.263
	(0.143)	(0.185)	(0.228)
Family income (in $1,000s)	0.999	0.998*	0.998*
	(0.000)	(0.001)	(0.001)
Elementary teacher	1.459**	1.124	1.196
	(0.278)	(0.244)	(0.264)
Secondary teacher	1.222	0.971	0.985
	(0.267)	(0.213)	(0.221)
Postgraduate education (at exit)	0.785	0.660*	0.687
	(0.175)	(0.163)	(0.167)
Age (at exit)	0.953	0.827***	0.820***
	(0.036)	(0.041)	(0.042)
Changed residence this year	0.951	0.932	0.899
	(0.224)	(0.208)	(0.203)
Second (or more) spell out	1.917***	1.580**	1.597**
	(0.353)	(0.321)	(0.322)
Hourly pay (at exit)		1.017***	1.017***
		(0.006)	(0.007)
Part-time		0.694*	0.657*
		(0.151)	(0.147)
Years experience (at exit)		1.270***	1.259***
		(0.058)	(0.060)
Local unemployment rate		0.999	1.001
		(0.026)	(0.027)
Number of children (ages 0-17)			1.672**
			(0.371)
Has child age 0-2			0.370***
			(0.134)
Has child age 3-4			0.447**
			(0.144)
Has child age 5-6			0.531
			(0.221)

Has child age 7-11			0.640
			(0.270)
Has child age 12-17			1.307
			(0.625)
Has child age 18+			0.275
			(0.293)
Observed time periods	1340	1259	1259
Observed spells	341	311	311

*Hazard ratios shown. Standard errors in parentheses, clustered by teacher. * p<0.10, ** p<0.05, *** p<0.01. All models control for urban location, Census region of residence, and time period indicators in five-year increments.*

TABLE 3: COX REGRESSION OF TIME TO RE-ENTRY BY GENDER

	Females	Males
	(1)	(2)
Black	0.726	1.231
	(0.258)	(1.059)
Hispanic	1.550	2.707
	(0.575)	(2.786)
Standardized ASVAB score	0.995	1.125**
	(0.018)	(0.061)
Married	1.504**	0.339**
	(0.305)	(0.182)
Family income (in $1,000s)	0.998	0.999
	(0.001)	(0.002)
Elementary teacher	1.260	1.047
	(0.304)	(0.660)
Secondary teacher	1.022	1.540
	(0.252)	(0.962)
Postgraduate education (at exit)	0.676	1.106
	(0.191)	(0.497)
Age (at exit)	0.784***	0.985
	(0.049)	(0.069)
Changed residence this year	1.068	0.812
	(0.281)	(0.449)
Second (or more) spell out	1.657**	0.873
	(0.376)	(0.442)
Hourly pay (at exit)	1.019**	1.004
	(0.008)	(0.046)
Part-time	0.766	0.429
	(0.162)	(0.363)
Years experience (at exit)	1.263***	1.511***
	(0.074)	(0.126)
Local unemployment rate	0.990	1.089
	(0.030)	(0.112)
Number of children (ages 0-17)	1.787**	1.347
	(0.479)	(0.992)
Has child age 0-2	0.307***	0.524
	(0.130)	(0.592)
Has child age 3-4	0.483**	0.266
	(0.173)	(0.257)
Has child age 5-6	0.464	1.168
	(0.271)	(0.959)
Has child age 7-11	0.563	0.749

	(0.317)	(0.829)
Has child age 12-17	1.232	1.368
	(0.970)	(0.959)
Has child age 18+	0.266	0.000
	(0.351)	(0.000)
Observed time periods	820	439
Observed spells	216	95

*Hazard ratios shown. Standard errors in parentheses, clustered by teacher. * p<0.10, ** p<0.05, *** p<0.01. All models control for urban location, Census region of residence, and time period indicators in five-year increments.*

TABLE 4: ANALYSIS OF TEACHERS WHO DO NOT WORK WHILE OUT OF TEACHING

	All Teachers		Females Only	
	(1)	(2)	(3)	(4)
No employment during spell out of teaching	1.803***	2.081***	1.839**	1.915**
	(0.395)	(0.517)	(0.473)	(0.553)
Has child age 0-2	0.392**	0.446**	0.327**	0.388**
	(0.149)	(0.162)	(0.144)	(0.169)
Has child age 3-4	0.470**	0.469*	0.485**	0.524
	(0.152)	(0.187)	(0.171)	(0.262)
Has child age 5-6	0.551	0.430*	0.501	0.265*
	(0.225)	(0.192)	(0.284)	(0.186)
Has child age 7-11	0.794	0.880	0.735	0.900
	(0.349)	(0.393)	(0.419)	(0.575)
Has child age 12-17	1.421	1.269	1.417	1.096
	(0.706)	(0.663)	(1.103)	(0.950)
Has child age 18+	0.262	0.291	0.263	0.336
	(0.277)	(0.311)	(0.337)	(0.437)
No employment x Has child age 0-2		0.626		0.780
		(0.401)		(0.565)
No employment x Has child age 3-4		0.959		0.665
		(0.455)		(0.341)
No employment x Has child age 5-6		2.260		6.733**
		(1.565)		(5.260)
No employment x Has child age 7-11		0.348		0.240
		(0.346)		(0.253)
No employment x Has child age 12-17		1.592		8.566
		(2.518)		(11.847)
No employment x Has child age 18+		--		--
		--		--
Observed time periods	1259	1259	820	820
Observed spells	311	311	216	216
p-value from Wald test for joint significance of interaction terms		$p = 0.04$		$p = 0.05$

*Hazard ratios shown. Standard errors in parentheses, clustered by teacher. * p<0.10, ** p<0.05, *** p<0.01. All models include full set of control variables from previous tables.*