



NEW FINDINGS ON THE RETENTION OF NOVICE TEACHERS FROM TEACHING RESIDENCY PROGRAMS

This brief updates earlier study findings (Silva et al. 2014) regarding the extent to which teachers trained through teaching residency programs (TRPs) funded through the U.S. Department of Education's Teacher Quality Partnership grants program are retained in their districts and schools. TRPs prepare new teachers primarily through a year-long residency in a high-need school and integrated coursework leading to a master's degree. This brief examines two cohorts of novice TRP teachers—those who were in their first year of teaching and those who were in their second year of teaching during the 2011–2012 school year. It looks at the rates at which the TRP teachers were retained in the same district or the same school as of fall 2013. To provide contextual information, the study also includes a representative sample of teachers who were in their first or second year of teaching during the 2011–2012 school year and were trained through other (non-TRP) programs. The retention analyses focus on teachers from six districts served by 12 TRPs. Key findings from the study include:

- *TRP teachers were more likely to remain teaching in the same district than non-TRP teachers with similar teaching placements.*
- *School-retention rates were similar between the two groups of teachers.*
- *TRP teachers who moved to different schools in the same district tended to join ones where a similar proportion of students were from low-income families, a lower percentage were black, and achievement was higher.*

Introduction

Teaching residency programs (TRPs) represent a relatively new approach to addressing two long-standing challenges in staffing high-need schools. One challenge is attracting and preparing new teachers to succeed in such settings. A second challenge is retaining these teachers over time. TRPs aim to prepare teachers to work effectively in high-need schools through a year-long fieldwork placement (called a residency) and integrated coursework leading to a master's degree. The U.S. Department of Education, which has funded TRPs through its Teacher Quality Partnership grant program,¹ also encourages TRPs to consider applicants who reflect the communities in which they will teach, as well as individuals from populations underrepresented in the teaching profession. TRPs funded with these grants must offer financial support to participants; those who accept it commit to teaching in a high-need school within the district for at least three years. Proponents of TRPs argue that this combination of candidate selection, the residency and coursework, and the teaching commitment will produce teachers who will be more effective and remain longer in their placement schools and districts than teachers from other preparation programs.

Using data from a study of 12 TRPs, this brief examines teacher retention rates and the characteristics of schools that mobile teachers transfer to and from. It updates results presented in

an earlier report (Silva et al. 2014) with an additional year of data, thereby tracking two successive cohorts of teachers into their third or fourth year as a teacher of record.² The brief addresses two research questions:

1. What are the retention rates of novice TRP teachers and other novice teachers?
2. What are the characteristics of schools that novice TRP teachers leave and enter?

The TRP model of teacher preparation has several distinct features. First, high-need districts act as partners in operating the programs.³ This allows the district's personnel needs and hiring objectives to influence who is admitted to the program and what the program's priorities are. Second, prospective teachers under this model simultaneously complete coursework toward a master's degree and carry out supervised fieldwork for at least one school year prior to becoming a teacher of record.⁴ This fieldwork takes place in a high-need school;⁵ it allows residents to practice their craft and take on increased teaching responsibility in a school similar to the one where they will be hired as a regular teacher after their residency—all under the guidance of an experienced, full-time classroom teacher. Residents are offered a stipend or salary during their residency year and in exchange are expected to be a full time teacher of record in a high-need school within the district for a minimum of three years.⁶ Finally, program participants are provided with on-the-job support (induction services) during their first two years of teaching.

Through these selection, preparation, commitment and support features, TRPs are expected to contribute to higher teacher retention rates in the districts compared to the retention rates of teachers from other preparation programs. They also might contribute to higher retention rates specifically in high-need schools within those districts. This is important because studies have suggested that teachers who move between schools in a district typically move to schools in which a somewhat smaller proportion of students come from economically disadvantaged families; they have also suggested that teachers move to schools where a smaller proportion are black or Hispanic and achievement levels are higher (Boyd et al. 2008; Jackson 2013; Steele et al. 2010).

In order to provide descriptive information on teacher retention rates and other characteristics of TRPs, the Department of Education's Institute of Education Sciences sponsored a large, multiyear study of 30 TRPs that received grants from the Teacher Quality Partnership program in fall 2009 or spring 2010.⁷ The first publication that grew out of this study (Silva et al. 2014) presented retention information for teachers making the transition from their first to their second year or their second to third year in the profession. The major findings on retention were twofold. First, according to district administrative records, retention rates were similar for novice TRP teachers and other novice teachers from spring 2012 to fall 2012. District-retention rates were about 89 percent for TRP teachers and 87 percent for non-TRP teachers; school-retention rates were about 77 percent and 79 percent, respectively. These were not statistically significant differences.⁸ Second, TRP teachers who moved to new schools generally joined schools that were similar to those they had left. The study compared six school characteristics: percentage of students who were black, percentage of students who were Hispanic, percentage who were English language learners, percentage who were eligible for free or reduced-price lunch, percentage who scored proficient or better on state tests in reading, and percentage who scored proficient or better in math. It found a statistically significant difference for only one of these, the percentage of students who were black (45 percent for the schools that TRP teachers left versus 35 percent for the schools they joined).

Prior to Silva et al. (2014), just one other study had addressed district-retention rates among TRP teachers (Papay et al. 2012). Papay et al. (2012) examined a single program, the Boston Teacher Residency. Using administrative data from the 2005–2006 through 2010–2011 school years, the study found that teachers from the Boston Teacher Residency were more likely than other similarly experienced teachers in Boston to continue teaching in the district into their fifth year. Five-year district retention rates were 75 percent for the residency teachers and 51 percent for other teachers. The study also found that most attrition among residency teachers occurred within the first three years, as the retention rate of 80 percent in year 3 declined only to 75 percent by year 5. In other words, the rate of attrition for the Boston residency teachers did not rise notably after they completed their third year, when they had fulfilled their three-year teaching commitment.

The analyses discussed in this brief examine retention for the same sample of novice TRP and non-TRP teachers included in Silva et al. (2014). The additional year of data in this brief, from fall 2012 to fall 2013, allows an examination of retention from spring 2012 to fall 2013. Teachers in one cohort (the “less-experienced cohort”) are tracked from their first to what would be their third year of teaching; those in the other cohort (the “more-experienced cohort”) are tracked from their second to what would be their fourth year of teaching. Teacher employment data in this brief come from districts’ administrative records.⁹

In the remainder of this brief, we provide an overview of the study design, present the new findings on retention, and conclude with a short discussion of the findings.

Study Design

The study includes analyses of retention rates for both novice TRP teachers and novice (non-TRP) teachers from other preparation programs teaching in the same districts. The retention rate of non-TRP teachers provides a useful benchmark; however, comparisons between TRP and non-TRP teachers do not represent estimates of the impact of TRPs on teacher retention rates. In this section we describe the basic elements of the study: the teachers included in it (the study sample), the sources of information about these teachers (the data sources), and the steps taken to arrive at our results (the analytical approach).

Who is included in the study?

The novice teachers selected for this study included (1) all the TRP teachers who were in their first or second year of teaching during the 2011–2012 school year, counting all experience in public or private schools, and were in one of the six districts that partner with 12 intentionally selected TRPs, and (2) a representative sample of all the non-TRP teachers in the same districts and with the same level of experience as the TRP teachers—that is, also in their first or second year of teaching overall.¹⁰

To select the sample of 12 TRPs from among the set of 30 grant-funded programs, we purposefully chose those that were older (established before 2010), that partnered with a single school district, and that served the largest number of residents. (The appendix compares the programs that were selected to those that were not.) The 12 selected programs accounted for only 40 percent of all TRPs funded through a Teacher Quality Partnership grant in late 2009 and early 2010, but owing to their larger average size, they accounted for about 60 percent of all TRP residents at the time the sample was drawn.

The final sample included 377 TRP teachers—219 in the less-experienced cohort (those in their first year of teaching in 2011–2012) and 158 in the more-experienced cohort (those in their second year of teaching in 2011–2012). The sample also included 376 non-TRP teachers—180 in the less-experienced cohort and 196 in the more-experienced cohort.¹¹

What sources of information does the study draw on?

The data for the analyses in this brief came from four main sources. We used district administrative data to determine whether teachers stayed in the same school, changed schools within the same district, or left the district. To determine whether the teachers taught a core academic subject or special education—factors that are included in our statistical model of retention rates—we used data from a spring 2012 survey of novice teachers of record. For the characteristics of novice teachers’ schools, we used data from the Department of Education’s Common Core of Data for the 2010–2011 school year¹² as well as state and district websites.

How were the results arrived at?

To determine retention rates, we compared the districts’ administrative records for teaching assignments in fall 2013 with the records for spring 2012. We examined whether teachers remained in the same district, even if they changed schools (the district-retention rate), or remained in the same school (the school-retention rate).¹³ In addition to comparing retention rates for all TRP teachers and all non-TRP teachers in the sample, we also made two further comparisons. The first looked at retention rates of more- and less-experienced TRP teachers compared to those of non-TRP peers, and the second compared rates for each of the six districts in the study. In order to compare teachers in similar teaching environments, all analyses controlled for some aspects of teachers’ spring 2012 placements—specifically, certain school characteristics and subjects taught.¹⁴ However, TRP and non-TRP teachers’ working conditions may differ in ways not captured by the variables in our analyses. Comparisons between TRP and non-TRP teachers are therefore provided for context, and do not represent estimates of the impact of TRPs on teacher retention rates.

The sample sizes of teachers in some districts are small—as low as 20 TRP teachers and 14 non-TRP teachers—thus, in some districts only large differences would be assessed as statistically significant. Readers should be cautious, therefore, in interpreting the findings from any particular district. But these analyses are useful in indicating whether TRP teachers’ retention rates are generally higher or lower than those of their non-TRP peers across the districts.

To analyze the schools that teachers left and joined, we looked at characteristics commonly associated with high need: achievement levels (the percentages of students who score proficient or better in math and reading) and demographic characteristics (the percentages of students who are black, percentages who are Hispanic, percentages who are English language learners, and percentages who are eligible for a free or reduced-price lunch). We looked not only at the average percentage of students who were eligible for a free or reduced-price lunch, but also at whether the TRP teachers’ new schools met one of two possible criteria for high need outlined by Teacher Quality Partnership residency grant requirements. Elementary schools can be considered high-need if they have at least 60 percent of their students eligible for this benefit and non-elementary schools can be considered high-need if they have at least 45 percent of their students eligible.¹⁵

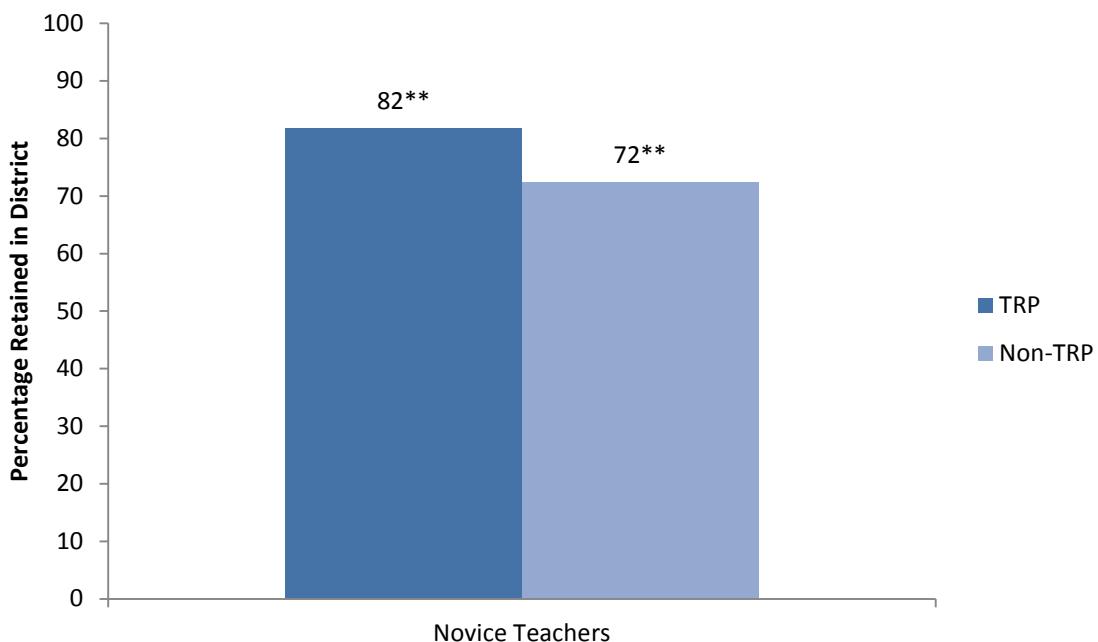
Findings

In this section we present teacher retention rates for schools and for districts. We also present the characteristics of schools that TRP teachers left and joined.

Novice teaching residency program teachers were more likely than other novice teachers to remain in their districts

Eighty-two percent of TRP teachers and 72 percent of non-TRP teachers remained in the same district from spring 2012 to fall 2013 (Figure 1), a statistically significant difference ($p = .004$). This time period represented retention from the first to the third year of teaching for some in the sample, and from the second to the fourth year for others.

Figure 1. Novice teachers' district-retention rates, spring 2012 to fall 2013



Sources: District data on teacher employment, teacher-of-record survey, mobility survey, Common Core of Data.

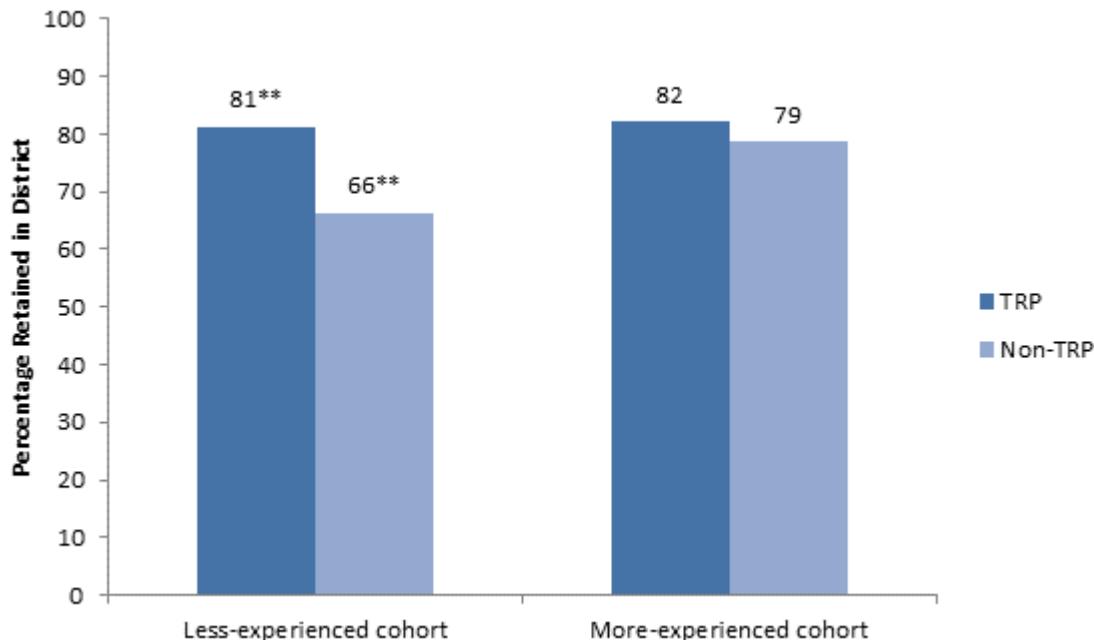
Notes: Retention outcomes were calculated using teacher employment data obtained from districts. Individuals who indicated on the teacher-of-record or mobility survey that they had more than two years of teaching experience in spring 2012 were removed from the sample. The TRP retention rate is not regression-adjusted. The non-TRP retention rate is a regression-adjusted rate, calculated as the unadjusted TRP retention rate minus the regression coefficient for the difference between the TRP and non-TRP groups. Details about the regression controls appear in the appendix. A two-tailed test of statistical significance was used. Sample sizes were 377 TRP and 376 non-TRP teachers.

** TRP and non-TRP retention rates differ by a statistically significant margin at the .01 level.

The finding that TRP teachers overall had a statistically significant higher district-retention rate is largely driven by the less-experienced cohort (Figure 2). In this cohort, TRP teachers were more likely than non-TRP teachers to have remained in the same district—81 percent versus 66 percent, a statistically significant difference ($p = .002$). In the more-experienced cohort, however, the difference, though in the same direction (82 percent for TRP teachers and 79 percent for non-TRP teachers), was not statistically significant. In addition, the retention differences are

mostly attributable to the less-experienced cohort between their second and third year of being the teacher of record.¹⁶

Figure 2. Novice teachers' district retention rates, spring 2012 to all 2013, by cohort



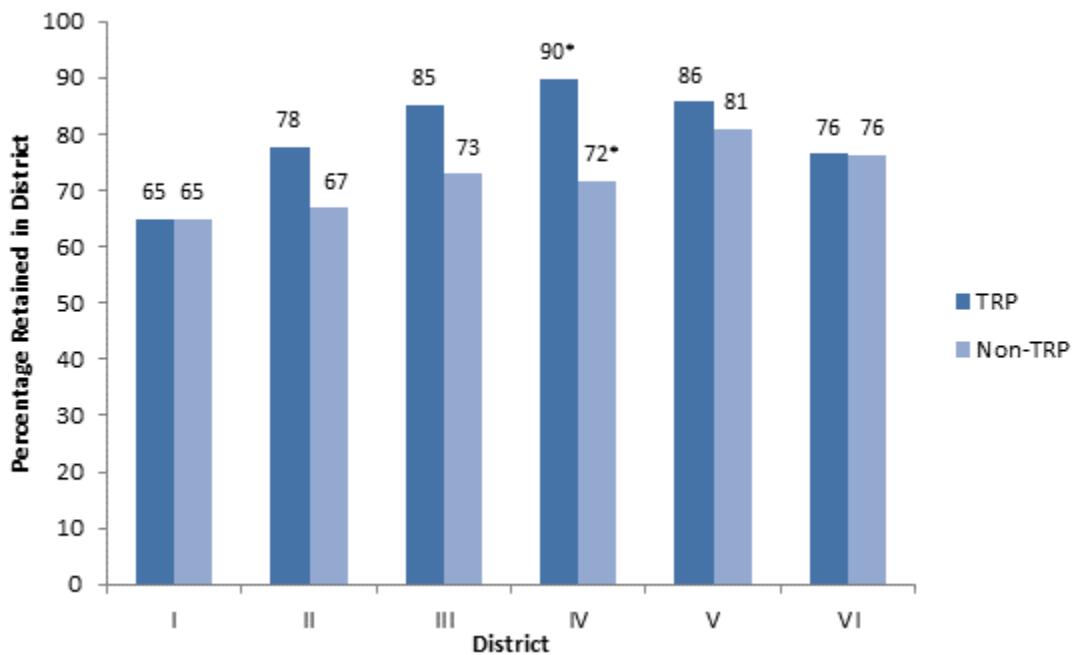
Sources: District data on teacher employment, teacher-of-record survey, mobility survey, Common Core of Data.

Notes: Retention outcomes were calculated using teacher employment data obtained from districts. Individuals who indicated on the teacher-of-record or mobility survey that they had more than two years of teaching experience in spring 2012 were removed from the sample. The less-experienced cohort comprised teachers who were in their first year as teachers of record in spring 2012; the more-experienced cohort comprised teachers who were in their second year as teachers of record in spring 2012. Some members of these cohorts may have left their schools or districts before we first observed them in spring 2012. The TRP retention rate is not regression-adjusted. The non-TRP retention rate is a regression-adjusted rate, calculated as the unadjusted TRP retention rate minus the regression coefficient for the difference between the TRP and non-TRP groups. Details about the regression controls appear in the appendix. A two-tailed test of statistical significance was used. Sample sizes were 219 TRP and 180 non-TRP teachers for the less-experienced cohort and 158 TRP and 196 non-TRP teachers for the more-experienced cohort.

** TRP and non-TRP retention rates differ by a statistically significant margin at the .01 level.

Examining the district-retention results by district reveals a pattern generally consistent across the six districts and consistent with the overall finding for the two cohorts combined (Figure 3). In each district, the retention rate for TRP teachers is higher than or the same as the rate for non-TRP teachers. In one case (District IV) the two groups differed by a statistically significant margin (90 percent versus 72 percent; $p = .021$).

Figure 3. Novice teachers' district-retention rates, spring 2012 to fall 2013, by district



Sources: District data on teacher employment, teacher-of-record survey, mobility survey, Common Core of Data.

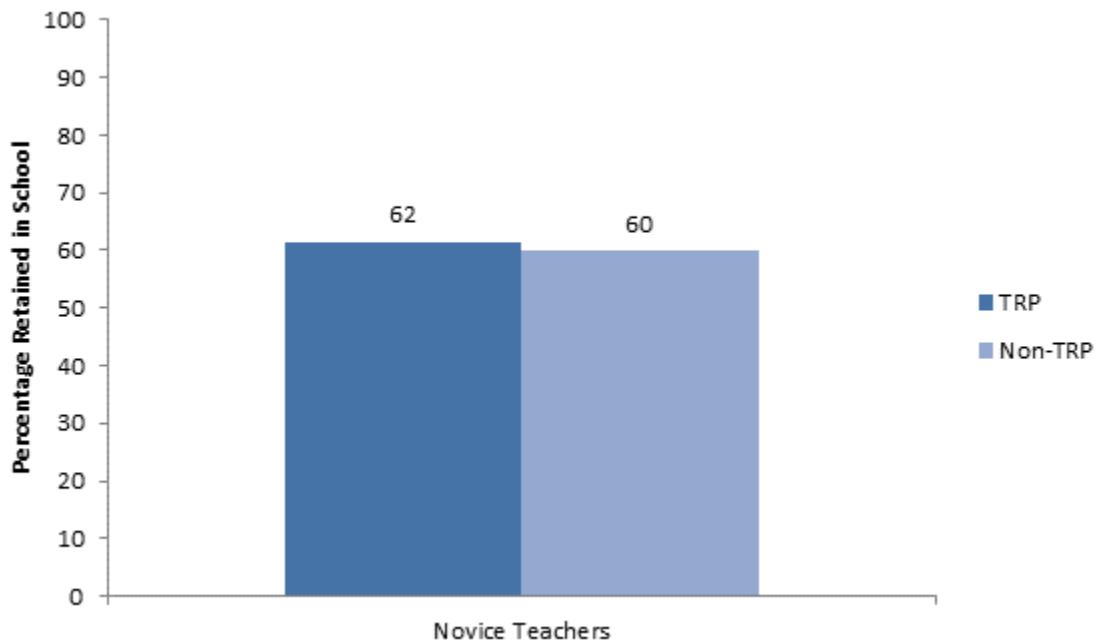
Notes: Retention outcomes were calculated using teacher employment data obtained from districts. Individuals who indicated on the teacher-of-record or mobility survey that they had more than two years of teaching experience in spring 2012 were removed from the sample. The TRP retention rate is not regression-adjusted. The non-TRP retention rate is a regression-adjusted rate, calculated as the unadjusted TRP retention rate minus the regression coefficient for the difference between the TRP and non-TRP groups. Details about the regression controls appear in the appendix. A two-tailed test of statistical significance was used. Districts are denoted by roman numerals to protect their identities; the roman numeral designations used in this brief are the same as those used in Silva et al. (2014). Sample sizes were 377 TRP and 376 non-TRP teachers. Sample sizes by district ranged from 20 to 98 TRP teachers and from 14 to 105 non-TRP teachers.

* TRP and non-TRP retention rates differ by a statistically significant margin at the .05 level.

This district-level finding raises a question: is the overall finding driven solely by retention differences in District IV? Further analysis suggests that the answer is no. When District IV is removed from the analysis sample, the overall TRP/non-TRP difference—80 percent versus 72 percent—remains statistically significant ($p = .020$). In other words, the overall finding persists for the other five districts collectively, even though the analysis cannot detect statistically significant differences between TRP and non-TRP teachers in the individual districts.

Novice teaching residency program teachers and other novice teachers remained in their schools at similar rates

Sixty-two percent of TRP teachers and 60 percent of non-TRP teachers remained in the same school from spring 2012 to fall 2013 (Figure 4), not a statistically significant difference. Again, this time period represented retention from the first to the third year of teaching for some in the sample, and from the second to the fourth year for others.

Figure 4. Novice teachers' school-retention rates, spring 2012 to fall 2013

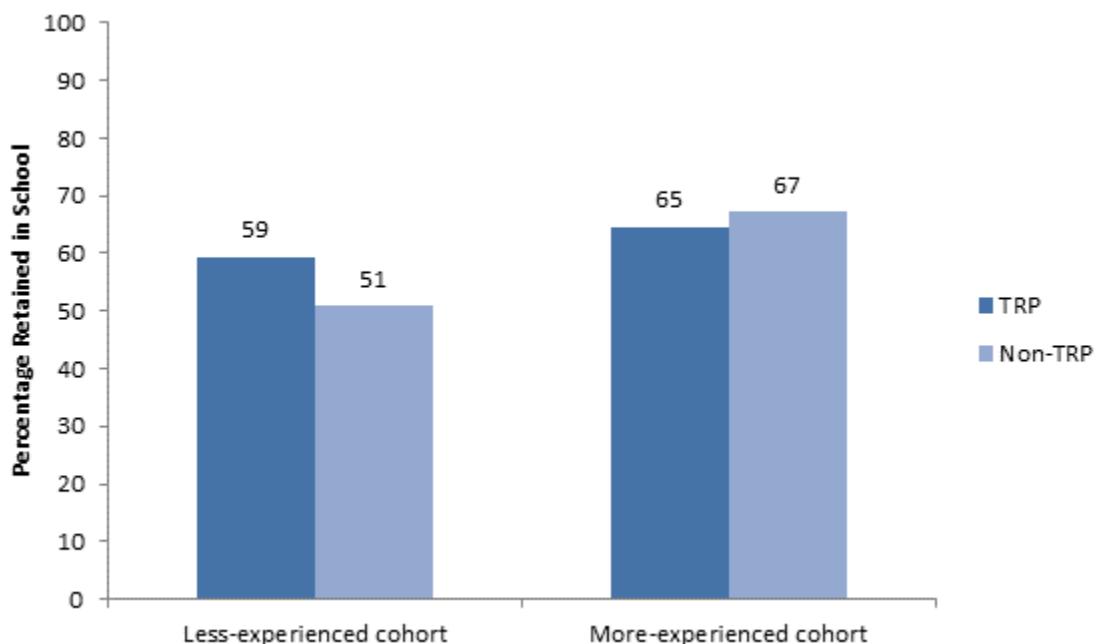
Sources: District data on teacher employment, teacher-of-record survey, mobility survey, Common Core of Data.

Notes: Retention outcomes were calculated using teacher employment data obtained from districts. Individuals who indicated on the teacher-of-record or mobility survey that they had more than two years of teaching experience in spring 2012 were removed from the sample. The TRP retention rate is not regression-adjusted. The non-TRP retention rate is a regression-adjusted rate, calculated as the unadjusted TRP retention rate minus the regression coefficient for the difference between the TRP and non-TRP groups. Details about the regression controls appear in the appendix. A two-tailed test of statistical significance was used. Sample sizes were 377 TRP and 376 non-TRP teachers.

TRP and non-TRP retention rates are not statistically different.

Dividing teachers into those with more and less experience also resulted in differences between groups that were not statistically significant (Figure 5). Among teachers in the less-experienced cohort, 59 percent of TRP teachers and 51 percent of non-TRP teachers remained in their spring 2012 school, not a statistically significant difference. Among teachers in the more-experienced cohort, 65 percent of TRP teachers and 67 percent of non-TRP teachers remained in their spring 2012 school, also not a statistically significant difference.

Figure 5. Novice teachers' school-retention rates, spring 2012 to fall 2013, by cohort



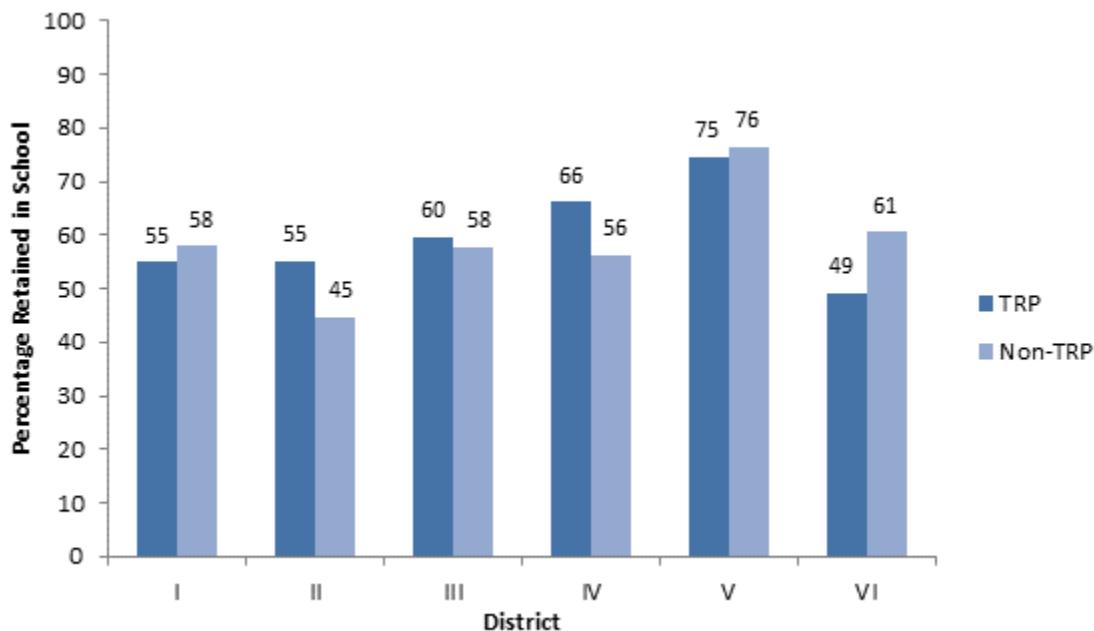
Sources: District data on teacher employment, teacher-of-record survey, mobility survey, Common Core of Data.

Notes: Retention outcomes were calculated using teacher employment data obtained from districts. Individuals who indicated on the teacher-of-record or mobility survey that they had more than two years of teaching experience in spring 2012 were removed from the sample. The less-experienced cohort comprised teachers who were in their first year as teachers of record in spring 2012; the more-experienced cohort comprised teachers who were in their second year as teachers of record in spring 2012. Some members of these cohorts may have left their schools or districts before we first observed them in spring 2012. The TRP retention rate is not regression-adjusted. The non-TRP retention rate is a regression-adjusted rate, calculated as the unadjusted TRP retention rate minus the regression coefficient for the difference between the TRP and non-TRP groups. Details about the regression controls appear in the appendix. A two-tailed test of statistical significance was used. Sample sizes were 219 TRP and 180 non-TRP teachers for the less-experienced cohort and 158 TRP and 196 non-TRP teachers for the more-experienced cohort.

TRP and non-TRP retention rates are not statistically different for either cohort.

Examining the school-retention results by district reveals no consistent pattern in the relationship between TRP teachers' and non-TRP teachers' rates (Figure 6). In three districts, TRP teachers had the higher rate and in the other three districts, non-TRP teachers had the higher rate. None of these differences were statistically significant however, possibly owing to small sample sizes.

Figure 6. Novice teachers' school-retention rates, spring 2012 to fall 2013, by district



Sources: District data on teacher employment, teacher-of-record survey, mobility survey, Common Core of Data.

Notes: Retention outcomes were calculated using teacher employment data obtained from districts. Individuals who indicated on the teacher-of-record or mobility survey that they had more than two years of teaching experience in spring 2012 were removed from the sample. The TRP retention rate is not regression-adjusted. The non-TRP retention rate is a regression-adjusted rate, calculated as the unadjusted TRP retention rate minus the regression coefficient for the difference between the TRP and non-TRP groups. Details about the regression controls appear in the appendix. A two-tailed test of statistical significance was used. Districts are denoted by roman numerals to protect their identities; the roman numeral designations used in this evaluation brief are the same as those used in Silva et al. (2014). Sample sizes were 377 TRP and 376 non-TRP teachers. Sample sizes by district ranged from 20 to 98 TRP teachers and from 14 to 105 non-TRP teachers.

TRP and non-TRP retention rates are not statistically different for any district.

Teaching residency program teachers who changed schools tended to join ones where a similar proportion of students were from low-income families, a lower percentage were black, and achievement was higher

Education stakeholders may wish to know whether TRP teachers who change schools move to schools that are also high need—or more broadly, whether the old and new schools' characteristics are similar or different. As mentioned earlier, some studies have found that teachers who move to a different school in their district typically move to schools in which a smaller proportion of students come from economically disadvantaged families, a smaller proportion are black or Hispanic, and achievement levels are higher. We examined this question for teachers who changed schools within the same district. Depending on the characteristics examined, somewhat different pictures emerge of how much the new schools differ from the old—although findings are limited to teachers for whom we had data for both the teacher's new and old school, as discussed at the end of this section.

When schools are compared on students' family income, mobile TRP teachers as well as non-TRP teachers tended to join high-need schools. Two types of analyses were conducted: the first looked at the average percentage of students who were eligible for a free or reduced-price lunch in the new schools, and the second looked at whether the new schools met the grant program's threshold for high need on this indicator. (As a reminder, elementary schools can be considered high-need by the Teacher Quality Partnership program if at least 60 percent of their students are eligible for a free or reduced-price lunch, and non-elementary schools can be considered high-need if at least 45 percent of their students are eligible.) The first analysis showed that a TRP teacher who changed schools joined one in which on average about 79 percent of students were eligible for a free or reduced-price lunch (Table 1). This figure is very similar to that for the schools they left, where on average 82 percent of the students were eligible—not a statistically significant difference. The second analysis (not displayed in the table) showed that 86 percent of these mobile TRP teachers moved to a school that met the threshold for high need on this indicator. About half (52 percent) of the mobile teachers joined an elementary school that met the criterion for these schools, and 34 percent joined a non-elementary school that met the criterion for these schools. The remaining 14 percent moved to a school that would not be considered high-need under the grant program criterion for this indicator.

Table 1. Characteristics of former and current schools of novice teachers who changed schools within districts, spring 2012 to fall 2013

Percentage of students in school who are...	Novice TRP teachers			Novice non-TRP teachers		
	School left	School joined	p-value of difference	School left	School joined	p-value of difference
Black	45.9	36.9	0.027	28.8	26.4	0.550
Hispanic	46.5	48.8	0.599	56.9	54.4	0.596
Eligible for free or reduced-price lunch	82.2	78.5	0.187	81.9	75.3	0.060
English language learners	20.9	22.8	0.464	23.7	24.5	0.814
Proficient or better in reading	40.2	50.0	0.000	48.1	52.2	0.200
Proficient or better in math	43.2	52.6	0.002	49.9	54.0	0.189
Sample size	61–72			38–44		

Sources: District data on teacher employment, Common Core of Data for the 2010–2011 school year (for percentage black, Hispanic, and eligible for free or reduced-priced lunch), state and district websites for 2012 (for percentage English language learners and percentage proficient in reading, math).

Notes: The former and current schools were determined using teacher employment verification data obtained from districts. Characteristics were measured at the school level; the table reports mean values calculated by averaging across schools. A two-tailed test of statistical significance was used. Sample sizes vary because of missing data.

For comparison, we conducted similar analyses for mobile non-TRP teachers. The average non-TRP teacher who changed schools left one in which 82 percent of the students were eligible for a free or reduced-price lunch, and joined one in which 75 percent of students were eligible, not a statistically significant difference (Table 1). In addition (not displayed in the table), 79 percent of these mobile teachers moved to a school that met the grant program definition of high need. About half (48 percent) of the mobile non-TRPs teachers joined an elementary school that met the

criterion for high need, and 31 percent joined a non-elementary school that met the criterion for high need. The remaining 21 percent moved to a school that would not be considered high need under the criterion.

Mobile TRP teachers typically joined schools where achievement was higher and a smaller percentage of the students were black. In the teachers' new schools, the average share of students scoring proficient or better on state reading tests was about 10 percentage points higher ($p < .001$) than in their old schools, and the share scoring proficient or better on state math tests was about 9 percentage points higher ($p = .002$) (Table 1). The average percentage of students who were black was about 9 percentage points lower ($p = .027$) in teachers' new schools than in their old schools. The new schools did not have a statistically higher or lower percentage of students who were Hispanic.

For points of comparison, we conducted similar analyses for the 13 percent of non-TRP teachers who changed schools in their district. The analysis found no statistically significant differences between the characteristics of the schools non-TRP teachers left and the ones they joined (Table 1).

In considering the results in this section concerning school characteristics, two cautions should be noted. First, the free and reduced-price lunch eligibility criterion is one of two definitions of high-need schools specified in program requirements. Schools that were not high-need according to this criterion may have met the other definition if they were among the district's top 25 percent according to various poverty measures listed in the grant guidelines. Second, a sizeable share of teachers had to be excluded from the analyses because of missing data. About 20 percent of the teachers who changed schools within their districts (15 of the 76 novice TRP teachers and 10 of the 48 non-TRP novice teachers) were excluded because data on the percentage of students eligible for a free or reduced-price lunch were missing for either their new or old school. For analyses involving other school characteristics, the share of teachers excluded because of missing data varied depending on the characteristic examined (from 5 to 20 percent of TRP teachers and from 8 to 17 percent of non-TRP teachers).¹⁷ These missing data make us less confident about generalizing from the findings, and the smaller sample sizes make it harder to detect differences between groups of schools.

Discussion

Education leaders have long been concerned with the challenges that high-need schools face in attracting and retaining effective teachers. TRPs were established by local education stakeholders around the country with the goal of recruiting and training new teachers who would be more effective than their peers from other programs, and who would remain in high-need districts and schools longer.

Examining data for an additional year, the findings in this brief can be considered alongside those from the earlier report (Silva et al. 2014). Between spring 2012 and fall 2012, we found in the earlier report that TRP and non-TRP teachers' district-retention rates did not differ by a statistically significant margin. This finding was true for both the less-experienced teachers who would be in their second year of teaching in fall 2012 and the more-experienced teachers who would be in their third year of teaching. However, this brief shows that over the longer period

between spring 2012 and fall 2013 examined in this brief, TRP teachers overall were significantly more likely than non-TRP teachers to be retained in the district, a difference that was largely driven by the experiences of the less-experienced cohort. TRP teachers in this cohort, entering what would be their third year of teaching, were 15 percentage points more likely than their non-TRP peers to still be teaching in the same district in fall 2013. These results suggest that the difference in district retention between TRP and non-TRP teachers in the less-experienced cohort emerged between their second and third years of teaching. Neither the earlier report nor this brief found any statistically significant differences for the rates at which TRP and non-TRP teachers, overall or by cohort, were retained in the same school.

Like this brief, the earlier study of teacher retention in Boston (Papay et al. 2012) also found that TRP teachers had higher district retention rates than did teachers from other programs. This brief, however, unlike Papay et al. (2012), accounted for some key aspects of the teachers' placements that might influence their retention, including characteristics of teachers' spring 2012 school and the subjects they taught. Unlike the current study, however, the Boston study was able to provide some evidence on patterns of attrition among TRP teachers following the end of their teaching commitment period.¹⁸ These findings—that Boston residency teachers' attrition rates did not notably increase from their third to their fifth year of teaching—suggest that attrition rates among TRP teachers may not change dramatically following the end of the teaching commitment period for TRP teachers.

Unlike Papay et al. (2012), this brief also looked beyond novice teachers' retention rates to compare the characteristics of schools that mobile teachers left and joined. Some of our findings are in line with findings from prior studies. TRP teachers who changed schools within the district moved to schools where, on average, a smaller percentage of students were black and student performance was higher. These patterns are similar to those described by Steele et al. (2010) and Jackson (2013). In contrast, however, the mobile TRP teachers did not move to schools where, on average, a lower percentage of students were Hispanic or eligible for a free or reduced-price lunch, which runs counter to the patterns described by Boyd et al. (2008) and Jackson (2013). Since racial/ethnic composition, student performance, and lower family income are all factors associated with high need in schools, we are left to conclude that whether mobile TRP teachers moved to schools that were more or less needy depends on how one chooses to measure need.

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Appendix

This appendix presents information on the characteristics of programs in and out of the sample used for the retention analyses, describes how ineligible teachers were excluded from the study, explains the analytic approach to estimating retention rates, and describes the results of a sensitivity analysis concerning the estimate of teacher retention rates.

Characteristics of programs in and out of the sample used for the retention analyses

Comparisons of the 12 programs purposefully selected for the retention analyses and the 18 programs not selected for this sample revealed statistically significant differences for 7 of the 13 basic characteristics we examined (Table A.1). The data for this analysis come from the program survey, which was conducted in spring 2012.

- Some differences emerged concerning program characteristics. As expected, the programs in the retention analysis were larger, served fewer districts, and were older than programs not in the sample. They served more residents in 2011 (about 38 versus 14; $p < .001$), and had more mentors (42 versus 17; $p < .001$). Most sampled programs served a single partner district, compared with an average of three partner districts for other programs ($p = .007$). They had been operating for five years as of spring 2012, on average, compared with less than two years for programs not sampled ($p = .002$).
- Some differences also emerged regarding their operations. The programs in the retention analysis sample offered lower stipends to their residents, on average, than those not in the sample (\$18,800 versus \$25,833; $p = .024$). They also were less likely than other programs to report having a minimum requirement for the number of full-length school days that residents are fully in charge of a classroom during the second half of the residency year (33 percent versus 72 percent; $p = .036$); among all programs that did have a minimum requirement, the sampled programs on average required that residents spend fewer days fully in charge (8 days versus 26 days; $p = .049$).

Table A.1. Characteristics of teaching residency programs in and out of the purposeful retention sample

Characteristic	Programs in retention sample	Programs not in retention sample	p-value of difference
Years in operation	5.1	1.8	0.002
Number of partner districts that have hosted residents who entered program in 2011	1.1	3.1	0.007
Number of residents who entered program in 2011	37.9	14.4	0.000
Number of classroom mentors for residents who entered program in 2011	42.3	17.3	0.000
Number of classroom mentors per resident who entered program in 2011	1.3	1.3	0.976
Hours of training provided to classroom mentors	33.5	30.2	0.755
Compensation paid to classroom mentors per semester (\$)	1,500	1,088	0.128
Annual stipend paid to residents (\$)	18,800	25,833	0.024
Duration of first half of residency year (weeks)	17.8	17.9	0.915
Duration of second half of residency year (weeks)	20.2	19.5	0.593
Percentage of programs that have a minimum requirement for the number of full-length school days during which resident is fully in charge of a classroom (first half of residency year)	41.7	44.4	0.885
Among those programs that have a minimum requirement, average minimum days residents spent fully in charge of classroom (first half of residency year)	3.3	14.8	0.088
Percentage of programs that have a minimum requirement for the number of full-length school days during which resident is fully in charge of a classroom (second half of residency year)	33.3	72.2	0.036
Among those programs that have a minimum requirement, average minimum number of days residents spent fully in charge of classroom (second half of residency year)	8.3	26.4	0.049
Sample size	11–12	17–18	

Source: Program survey.

Note: Characteristics were measured at the program level; the table reports mean values calculated by averaging across programs. Unless otherwise noted, characteristics were measured in spring 2012. A two-tailed test of statistical significance was used.

Removal of ineligible teachers from the analysis sample

Before conducting retention analyses, we removed from the sample all teachers who could be identified as not meeting our definition of novice teachers. The six districts in the study had provided us with lists of all teachers—both from TRPs and from other programs—they believed to be in either their first or second year of teaching as of spring 2012. Because districts might not know about teachers’ experience before joining the district, however, we tried twice to have teachers tell us directly about their own years of teaching experience. Both a teacher-of-record survey conducted in spring 2012 and a mobility survey conducted in fall 2012 included screener questions to identify teachers who had more than two years of teaching experience in total as of spring 2012. (Years teaching in private schools were included in the total.) All teachers who self-identified as non-novices were excluded from the study. Among non-TRP teachers, 19 percent were excluded from this analysis because they reported having more than two years of teaching experience overall (as of spring 2012). Among TRP teachers identified by the programs as coming out of the programs in the relevant years, 10 percent were excluded for this reason.

Analytic approach to estimating retention rates

In estimating the retention rates of TRP and non-TRP novice teachers, we use a regression model that controls for readily measurable aspects of their teaching placements that might be related to their retention. By controlling for key aspects of teaching placements, we seek to compare TRP teachers to a set of non-TRP teachers who had similar teaching placements and hence work under similar conditions. The model estimates the relationship between retention outcomes (retained in district or in school) and whether the novice was a TRP or non-TRP teacher. The model includes the following control variables:

- A set of variables identifying the districts in the study
- An indicator for being a second-year teacher in spring 2012 (a member of what we call the more-experienced cohort)
- Characteristics of the teacher’s spring 2012 school, available in the Common Core of Data, as follows: percentage of students who are black, percentage Hispanic; percentage eligible for free or reduced-price meals; school-level indicators (middle school, high school, other); indicator for missing one or more of the above school characteristics
- Characteristics of the teacher’s spring 2012 classroom subject, as follows: indicator for teaching a core academic subject (English, math, science, social studies); indicator for teaching special education; indicator for missing the above subject information

We present simple (not regression-adjusted) mean values for TRP teachers, along with regression-adjusted mean values for the non-TRP teachers. All retention estimates were obtained using a linear probability model.

Retention rates by cohort and years of experience

Figure 2 in the main text showed that differences in TRP versus non-TRP retention rates were statistically significant for the less-experienced cohort of teachers, but were smaller and not statistically significant for the more-experienced cohort. Since our data cover different periods in the careers of teachers in the two cohorts, it is possible that the data include the point at which the TRP versus non-TRP difference emerges for the less-experienced cohort but exclude this point for the more-experienced cohort. For example, if non-TRP teachers are more likely than TRP teachers to leave teaching after their first year, this difference would not be captured in the comparisons of TRP versus non-TRP retention rates in the more-experienced cohort.

We explored this issue by analyzing conditional retention rates of teachers in each cohort at each transition point covered by the data (Table A.2). The conditional retention rates measure the likelihood that a teacher who taught in a given year will continue teaching in the following year. We have evidence of retention between the first and second year of teaching only for the less-experienced cohort, and evidence of retention between the third and fourth year of teaching only for the more-experienced cohort. We have evidence of retention between the second and third years for both cohorts.

For the less-experienced cohort, we found no difference in retention (either in school or in the district) between the first and second year of teaching. The difference emerges for this cohort after the second year of teaching. For example, 93 percent of second-year TRP teachers in the less-experienced cohort were retained in the district into their third year of teaching, compared with 76 percent of non-TRP teachers, a statistically significant difference. By contrast, in the more-experienced cohort, we found no statistically significant difference between TRP and non-TRP teachers in their retention rates from their second to third year of teaching. For this cohort we also found no statistically significant difference in retention between the third and fourth year of teaching.

These findings suggest that the differences in TRP versus non-TRP retention rates for the less-experienced and more-experienced teachers reflect true cohort differences, and are not simply the result of the data covering different periods in the teaching careers of these two cohorts.

Table A.2. Novice teachers' school-retention and district-retention rates at each transition point, by cohort, spring 2012 to fall 2012 and fall 2012 to fall 2013

	First to second year of teaching			Second to third year of teaching			Third to fourth year of teaching					
	Percentage of less-experienced cohort (spring 2012 to fall 2012)		p-Value of difference	Percentage of less-experienced cohort (fall 2012 to fall 2013)		p-Value of difference	Percentage of more-experienced cohort (spring 2012 to fall 2012)		p-Value of difference	Percentage of more-experienced cohort (fall 2012 to fall 2013)		p-Value of difference
	TRP	Non-TRP		TRP	Non-TRP		TRP	Non-TRP		TRP	Non-TRP	
Retained in school	74.0	77.5	0.459	82.7	64.4	0.000	81.6	79.8	0.704	77.2	81.1	0.456
Retained in district	87.2	86.6	0.870	93.2	75.7	0.000	91.8	87.4	0.260	88.3	87.9	0.927
Sample size	219	180		191	160		158	196		145	172	

Sources: District data on teacher employment, teacher-of-record survey, mobility survey, Common Core of Data.

Notes: Retention outcomes were calculated using teacher employment data obtained from districts. Individuals who indicated on the teacher-of-record or mobility survey that they had more than two years of teaching experience in spring 2012 were removed from the sample. The less-experienced cohort comprised teachers who were in their first year as teachers of record in spring 2012; the more-experienced cohort comprised teachers who were in their second year as teachers of record in spring 2012. Some members of these cohorts may have left their schools or districts before we first observed them in spring 2012. The TRP retention rate is not regression-adjusted. The non-TRP retention rate is a regression-adjusted rate, calculated as the unadjusted TRP retention rate minus the regression coefficient for the difference between the TRP and non-TRP groups. Details about the regression controls appear elsewhere in this appendix.

Sensitivity analysis

Where possible, we also carried out a sensitivity check and analyzed the results using maximum likelihood estimation of a logit model. Maximum likelihood estimates of the logit might not exist where TRP status perfectly (or nearly perfectly) predicts retention for at least one of the two teacher groups or where sample sizes are small, as was sometimes the case when we examined retention separately by district. Logit estimates of TRP/non-TRP differences could not be obtained for school or district retention rates in District I.

Where it was possible to examine TRP versus non-TRP differences in retention outcomes using both the linear probability and logit models, the results of the two models were consistent, with one exception. Both models produced statistically significant differences in the spring 2012 to fall 2013 district-retention rate for the full sample and for the teachers who were in their first year of teaching during the 2011–2012 school year. The linear probability model also showed that for spring 2012 to fall 2013, the difference in district-retention rate for TRP and non-TRP teachers in District IV was a statistically significant 18.2 percentage points ($p = .021$). As estimated by the logit model, however, this difference was similar in magnitude (19.1 percentage points) but was not statistically significant ($p = .053$). Neither model produced statistically significant differences for any of the other district- and school-retention rates examined.

Endnotes

¹ Authority for this grant program comes under Title II of the Higher Education Act, as amended on August 14, 2008, by the Higher Education Opportunity Act (Public Law 110-315). The law also provided for Teacher Quality Partnership grants to fund two other types of programs, for school leadership and for pre-baccalaureate, fifth-year initial licensure.

² A teacher of record is defined as a full-time teacher who is responsible for content instruction and determining student grades.

³ According to program requirements, a district qualifies as high need if it serves a substantial number or percentage of children from low-income families and also (1) employs a high percentage of teachers who do not teach the subject or in the grade level in which they trained; (2) experiences a high teacher turnover rate; or (3) hires a high percentage of teachers with emergency, provisional, or temporary certification or licensure.

⁴ Applicants to these programs would not be admitted if they already had a master's degree in teaching/education. Applicants with a master's degree in some other field could be admitted.

⁵ According to program requirements, schools qualify as high need if they (1) are among the district's poorest (in the top 25 percent according to various poverty measures), or (2) have a certain percentage of students eligible for a free or reduced-price lunch (at least 60 percent for elementary schools and at least 45 percent for other schools).

⁶ Participants who want the financial support must apply for it (it is not automatically available). In exchange for the support, participants must agree to teach a high-need subject in a high-need school in a partner high-need district for at least three years, though programs may require longer teaching commitments. Participants must begin fulfilling their commitment immediately after their residency year, though programs may grant deferrals for beginning or completing the commitment “on grounds of health, incapacitation, inability to secure employment in a school served by the eligible partnership, being called to active duty in the Armed Forces of the United States, or other extraordinary circumstances.” Participants who do not complete their obligation must repay the funds to the partnership, with interest, in accordance with terms established by the partnership.

⁷ Note that this study focuses solely on residency programs funded through Teacher Quality Partnership grants, and not on other residency programs, which are not subject to the same requirements concerning structure and operation.

⁸ The study also examined retention rates based on data collected through surveys of the novice teachers in spring and fall 2012 and found similar results. About 92 percent of TRP teachers and 90 percent of non-TRP teachers reported staying in the same district; about 82 percent of TRP teachers and 83 percent of non-TRP teachers reported staying in the same school. These were not statistically significant differences.

⁹ Silva et al. (2014) analyzed retention rates based on districts' administrative records as well as data collected through a teacher mobility survey administered in fall 2012. Because these two analyses indicated similar results, a second teacher mobility survey data collection was not administered in fall 2013. Thus, the only retention data available for analysis in this brief are the administrative record data.

¹⁰ Random samples of non-TRP teachers, similar in size to the number of TRP teachers, were drawn to conserve data collection resources in all but one case. In one district sampling was not necessary because the total number of non-TRP teachers was close to the number of TRP teachers.

¹¹ Because some districts might not have known about teachers' years of experience elsewhere, a spring 2012 teacher-of-record survey and fall 2012 mobility survey each included a screener question to verify novice teacher status. Respondents who reported more than two years of teaching experience as of spring 2012 were retroactively removed from the sample. Additional details appear in the appendix.

¹² The 2010–2011 school year was the most recent year for which data were available in Common Core of Data at the time of data collection.

¹³ Note that our analyses do not measure retention from the point at which teachers left their preparation programs or first became teachers of record. We did not observe the teachers in our analysis until spring 2012, which was nearly one full school year (for the less-experienced cohort) or two full years (for the more-experienced cohort) after they were placed as teachers of record. We also do not have data on the total number of TRP graduates in each cohort.

¹⁴ The following school characteristics were controlled for in the analyses: percentage of students who are black, percentage of students who are Hispanic, percentage eligible for free or reduced-price meals, and school level (middle school, high school, other); these data came from the Common Core of Data, 2010–2011 school year. The analyses also controlled for whether the teachers were teaching a core academic subject (English, math, science, social studies), and whether they were teaching special education; these data came from the spring 2012 teacher-of-record survey. Details of the statistical model used to estimate retention rates appear in the appendix.

¹⁵ Under the second criterion, schools could also qualify as high need if they were among the district's top 25 percent according to various poverty measures listed in the grant guidelines. We did not know which of the two types of criteria districts used when identifying high-need schools, nor which specific poverty measures they might have under this second criterion. Therefore, we used the first criterion for the analyses in this brief. We defined school levels using the Common Core of Data school-level variable, which specifies four levels: primary, middle, high, or other. Primary schools were coded as elementary schools. Schools at the other three levels were coded as non-elementary schools.

¹⁶ Further evidence on differences by cohort—information on how conditional retention rates vary by cohort and years of experience at a particular point in time—appears in the appendix. This analysis shows that in the less-experienced cohort, differences in TRP versus non-TRP conditional retention rates emerge only after the second year of teaching; differences after one year of teaching are not statistically significant (Table A.2).

¹⁷ The school characteristics data missing from this analysis were missing in the original data sources—the Common Core of Data and state and district websites. Because mobile teachers must have non-missing values for both their old and new schools to be included in this analysis, the percentage of teachers excluded from the analysis because of missing data is higher than it would be if we were examining school characteristics at a single time point. Obtaining data from other sources was not within the scope of this study. Imputing missing values of school characteristics (perhaps through multiple imputation) was not a viable strategy because, in many cases, schools were missing information on several school characteristics, leaving us with little information on which to base the imputation.

¹⁸ In the study described in this brief, tracking a substantial number of TRP teachers beyond the point at which they had completed their teaching commitment was not possible. First, some of the TRPs were too new to have had any teachers in the more-experienced cohort; they had placed only one cohort of participants into full-time teaching positions as of spring 2012. Second, for the more-experienced cohort to provide data on retention beyond the teaching commitment period, its members would have had to make a three-year teaching commitment that had to be completed in the first three years after program completion. However, this was not always the case. Some of the TRPs that had teachers in the more-experienced cohort either (a) did not offer stipends to participants who joined prior to the program's receipt of a Teacher Quality Partnership grant, and so those participants had no requirement to teach in the partner district for a minimum number of years, (b) required their participants to teach for more than three years, or (c) allowed their participants more than three years in which to fulfill a three-year commitment.

For more information on the full study, please visit:

http://ies.ed.gov/ncee/projects/evaluation/tq_residency.asp



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