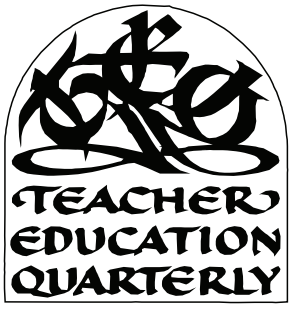


# School Working Conditions and Changes in Student Teachers' Planned Persistence in Teaching

**Matthew Shirrell & Michelle Reininger**

Student teaching is an important step in the early career paths of nearly every public school teacher in the United States, with 89% of U.S. public school teachers reporting having completed some amount of student teaching prior to their entry into the teacher workforce.[1] Student teaching is also a central component of teacher preparation around the world (Darling-Hammond & Cobb, 1995; Wang, Coleman, Coley, & Phelps, 2003). In the United States, student teaching is becoming even more important, with recent national recommendations calling for teacher education to focus increasingly on field experiences (National Council for Accreditation of Teacher Education, 2010).

Experiences during student teaching are linked to a variety of student teacher outcomes, including beliefs, attitudes, and practices (Blanton, Berenson, & Norwood, 2001; Fives, Hamman, & Olivarez, 2007; Grossman et al., 2000). Recent research has also used large-scale data to examine the links between aspects of student teaching and later entry and persistence in teaching (Goldhaber, Krieg, &

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Theobald, 2013; Ronfeldt, 2012); teachers' preferences to work with underserved students (Ronfeldt, Kwok, & Reininger, 2014); student teachers' perceptions of efficacy, preparedness, and career plans (Ronfeldt & Reininger, 2012; Ronfeldt, Reininger, & Kwok, 2013); and teachers' later effectiveness (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Ronfeldt, 2012). This work has deepened our understanding of the connections between student teaching experiences and student teachers' choices about whether, where, and for how long to teach.

Relatively little is known, however, about the role of the workplace contexts where student teaching takes place—student teaching schools—in shaping student teacher outcomes. This gap in our understanding exists despite the fact that student teaching schools are important sites for teacher learning and can vary widely in terms of both the material resources (such as curricula and assessments) and relational resources (such as trust between teachers) that they make available to student teachers (Grossman, Ronfeldt, & Cohen, 2012). Among in-service teachers, school working conditions are significant predictors of teacher turnover and attrition (Ingersoll, 2001; Jackson, 2009; Johnson & Birkeland, 2003; Ladd, 2011; Loeb, Darling-Hammond, & Luczak, 2005), yet it remains an open question whether the school contexts where student teaching takes place also matter to student teachers' decisions about their future careers or whether other aspects of the student teaching experience—such as work with cooperating teachers or the support offered by teacher preparation programs—are more important.

This study examines the relationship between the working conditions of student teaching schools and changes in student teachers' planned persistence in teaching. Planned persistence (and a related construct, initial commitment) is an important predictor of initial entry (Rots, Aelterman, Vlerick, & Vermeulen, 2007) and actual persistence in teaching (Chapman, 1984; Chapman & Green, 1986; Johnson & Birkeland, 2003), making planned persistence an important outcome of interest. This study quantifies the working conditions of student teaching schools in two ways: first, using surveys of more than 1,000 student teachers who student taught in one large urban district during 2 years, and second, using several years of district administrative data on in-service teacher stability in those schools. These measures of school working conditions are used to predict changes during student teaching in student teachers' planned persistence in education, teaching, and the district where they student taught. These analyses shed light on whether the broader school workplace matters to student teachers as they make plans for their future careers or whether other aspects of student teaching are more important, and have implications for the decisions student teaching programs—and school districts—make about where to place student teachers.

## Literature Review

### *Student Teachers' Career Plans*

Student teaching experiences are associated with changes in a variety of outcomes for student teachers, including instructional practices (Blanton et al., 2001; Grossman et al., 2000), stress and burnout (Fives et al., 2007), and job satisfaction (Oh, Ankers, Llamas, & Tomyoy, 2005). Student teaching placements that match teachers' first teaching assignments are also associated with greater student achievement gains in teachers' first years in the classroom (Boyd et al., 2009), and student teaching in easy-to-staff urban schools positively predicts later teacher effectiveness and retention (Ronfeldt, 2012). Aspects of student teaching schools also are associated with later hiring: One recent study found that student teachers who student taught in suburban schools and in schools with greater teacher turnover were more likely to later be hired as full-time teachers (Goldhaber et al., 2013).

Despite the widely accepted importance of student teaching, little research has examined changes during student teaching in student teachers' planned persistence in education, teaching, or their placement district. Planned persistence is important because planned persistence predicts both entry (Rots et al., 2007) and actual persistence in teaching (Chapman, 1984; Chapman & Green, 1986; Johnson & Birkeland, 2003). Three recent studies have examined changes in student teachers' planned persistence during student teaching. Ronfeldt et al. (2014) examined changes in student teachers' plans to work with underserved students and found changes in these preferences during student teaching, although the authors did not connect these changes with the working conditions of student teaching schools. Ronfeldt and Reininger (2012) explored whether the length or the perceived quality of student teaching predicted a variety of outcomes, including planned persistence in the district and in teaching; they found that student teachers' satisfaction with their student teaching schools predicted increases in planned persistence in the district (but not in teaching), but they did not examine the specific aspects of student teaching schools that predicted this satisfaction. Ronfeldt et al. (2013) found that most student teaching school characteristics did not predict changes in planned persistence; however, their analysis did not include the variety of measures of school working conditions included in the present study.

### *School Working Conditions*

School working conditions are important predictors of in-service teachers' decisions to remain in or leave their schools and teaching (Ingersoll, 2001; Jackson, 2009; Johnson & Birkeland, 2003; Ladd, 2011; Loeb et al., 2005). School working conditions are generally defined as those elements of teachers' workplaces unrelated to their pay or benefits (Johnson, 2006; Ladd, 2011) and encompass a variety of aspects of schools, including their physical environments; organizational

patterns of authority, supervision, and interaction among employees; employees' characteristics, roles, and statuses; the sense of equity and voice among the staff; the strength and supportiveness of the school culture; teachers' opportunities for learning and growth; and educational aspects of schools such as curricula and assessments (Johnson, 1990, 2006).

Even after controlling for other characteristics of teachers and their schools, aspects of school working conditions, particularly administrative support and input into school decision making, play significant roles in the job satisfaction of in-service teachers (Ingersoll, 2001). In-service teacher turnover is also significantly related to poor working conditions, such as large class sizes, degraded school facilities, and lack of textbooks (Loeb et al., 2005), as well as to student demographics (Jackson, 2009). New teachers' decisions to leave their schools and teaching are particularly sensitive to their perceptions of the support provided to them by their schools, particularly support in meeting the needs of their students, as well as aspects of school leadership (Johnson & Birkeland, 2003; Ladd, 2011). Ladd found that the addition of working conditions variables raised the explanatory power of models predicting in-service teacher turnover by approximately 60% and that the predictive power of working conditions far exceeded that of other school characteristics. In-service teachers' planned persistence in teaching is also associated with their perceptions of their school working conditions: Teachers' perceptions of their school cultures as promoting collaboration and teacher participation in decision making and as having orderly environments are significantly and positively associated with the number of years teachers plan to teach (Weiss, 1999) and to their commitment to teaching (Riehl & Sipple, 1996).

Studies of the working conditions of student teaching schools have focused on various aspects of school working conditions and found different relationships between these aspects of working conditions and student teachers' planned persistence in teaching. Huang and Waxman (2008) found that student teachers' perceptions of certain aspects of the supportiveness of their workplaces, including "staff freedom," "gender equity," and "work pressure," were positively correlated with the number of years they planned to teach. Ronfeldt et al. (2013) focused on different aspects of working conditions, particularly student demographics and teacher qualifications, and found few associations between these aspects of working conditions and changes in student teachers' planned persistence in teaching or the district. Ronfeldt (2012) used the teacher stability rates of student teaching schools—defined as the percentage of the previous year's teachers remaining in the school the following school year—as a proxy for school working conditions and found that stability rates were highly correlated with first-year teachers' reports on the working conditions of their schools, particularly their reports of administrative quality and support (Ronfeldt, 2012). In addition, Ronfeldt found that teacher stability was significantly and positively associated with student teachers' reports of how much they observed excellent teachers and other role

models during student teaching as well as with the amount of useful feedback they received.

### *Student Teaching as a Realistic Job Preview*

One way that student teaching may affect student teachers' planned persistence in teaching is by serving as a realistic job preview for teaching. In contrast to traditional job previews, where applicants for a job are presented with largely positive information on the job they are applying for, realistic job previews provide applicants with both positive and negative information about the job (Phillips, 1998). Experiments testing the effects of realistic job previews have demonstrated that, when compared to traditional job previews, realistic job previews lowered the number of applicants who remain in consideration for a job (Premack & Wanous, 1985). By giving applicants a realistic preview of the job, these job previews help applicants more accurately determine if a job is right for them (Breaugh, 1983).

Student teaching serves as a realistic job preview for teaching by giving aspiring teachers a sense of what the work of teaching is like. During student teaching, student teachers take over the responsibilities of classroom teachers entirely for some period of time. For some student teachers, this job preview likely affirms and strengthens their commitment to teach; for other student teachers, the experience may weaken their commitment to teaching or discourage them from entering the profession altogether. Importantly, these job previews likely pertain not just to student teachers' work in the classroom but also to their experiences of the schools where they work. Student teachers, after all, join not just a classroom but a school as well. Given this fact, the school workplace may influence student teachers' plans about whether, where, and for how long they plan to teach.

### *Research Questions*

This study investigated two research questions related to school working conditions and student teachers' planned persistence in teaching:

1. Does student teachers' planned persistence in education, teaching, and the district where they student taught change during student teaching? If so, does planned persistence increase or decrease?

2. Are changes in student teachers' planned persistence in education, teaching, and the district where they student taught associated with the working conditions of student teaching schools? Do these associations remain after controlling for student teacher characteristics and the characteristics of student teaching placements and schools?

## Methods

### *Data and Sample*

This study examined student teaching in a single large urban school district, which is not named to protect its confidentiality. At the time of our study, nearly 50% of district students were African American, and 40% were Hispanic; more than 80% of students qualified for free or reduced-price school lunch. The district requires student teachers to register with the central district office before being placed at a district school, and partnered with the researchers in 2008 to better understand student teaching in the district.[2] During the 2008–2009 and 2009–2010 school years, the district provided the researchers with registration data for every student teacher in the district. These data, which included contact information, basic demographic information, and the names of student teaching schools, were provided at the beginning of the fall and spring semesters of each school year. Near the outset of each semester, student teachers on that semester's registration list were sent a link to an online survey; at the end of each semester, student teachers were sent a link to a second online survey that asked similar questions to the first. (These surveys are referred to as "entry" and "exit" surveys in the remainder of this study.) Surveys were timed to academic semesters because most student teachers begin student teaching at the beginning of these academic periods.

The researchers developed the surveys to gather information on the student teaching experiences of teacher preparation candidates. The surveys included approximately 45 questions and asked about student teachers' student teaching placements, preparation program experiences, expectations for and experiences during the student teaching placement, career plans, and basic background characteristics. A variety of survey response formats were used, including dichotomous, multiple response, Likert scale, ranking, and open-response formats.[3] Many of the questions were adapted, with permission, from the New York City Teaching Pathways survey and surveys designed by the Center for Research on the Context of Teaching at Stanford University.[4] Focus groups and interviews were conducted in late 2007 and early 2008 with teachers, principals, district officials, and teacher education faculty to help inform the researchers about the nuance of the context of the particular research setting, and the surveys were piloted with multiple groups of current and former teachers, whose feedback was used to revise the surveys for clarity and concision.

Across the four survey administrations (fall 2008, spring 2009, fall 2009, and spring 2010), entry surveys were sent to a total of 3,454 student teachers; 1,764 student teachers responded to these surveys, for an overall response rate of 51%.[5] Across the four administrations, exit surveys were sent to a total of 1,653 student teachers;[6] we received 1,002 exit survey responses, a response rate of 61%. (Appendix A contains the individual response rates for each survey administration.) A comparison of the gender and race of survey respondents and nonrespondents found no evidence of nonresponse bias.[7]

Descriptive statistics on every student teacher who responded to a survey (entry or exit) are presented in the first column of Table 1. Because this study examined changes in student teachers' career plans during student teaching, the analytic sample was limited to student teachers who responded to both an entry and an exit survey. The second and third columns of Table 1 use paired sample t-tests to compare the characteristics of student teachers who responded only to an entry survey to those who responded to both surveys. Student teachers who responded only to an entry survey were largely indistinguishable from those who responded to both surveys.[8] The final column of Table 1 presents summary statistics on the 1,002 student teachers who responded to both surveys over the entire period of our study and were therefore included in the analytic sample. Most student teachers were female, White, between the ages of 21 and 23 years, pursuing bachelor's degrees, and graduates of suburban high schools. Nearly one-third of student teachers graduated from high school in the city where the district is located, and 87% of student teachers reported that the district was their first-choice district for student teaching, although only one-quarter of student teachers reported that they were required to student teach there. Although this information is not contained in the table, these student teachers were roughly evenly split between private (55%) and public (45%) colleges or universities; 86% of the student teachers were from colleges or universities in the metropolitan area where the district was located.

In addition to survey data, this study also used publicly available data on the 1-year teacher stability rates of district schools for the years 2003–2004 through 2006–2007. As noted earlier, a school's stability rate was defined as the percentage of the previous year's teachers remaining in that school the following school year. Data on the school-level stability rates were made publicly available by a research organization that works closely with the school district and were merged with our survey data for purposes of these analyses.

Table 2 shows descriptive statistics on the 295 schools where sampled student teachers completed their student teaching. The first column again shows these statistics for all student teachers who responded to an entry or an exit survey, while the second and third columns show statistics for student teachers who responded only to an entry survey or to both surveys, respectively. Similar to Table 1, Table 2 compares the characteristics of student teaching schools for student teachers who completed only an entry survey to the student teaching schools of student teachers who completed both surveys; the student teaching schools of these two groups were generally indistinguishable, providing some reassurance that the loss of student teachers who responded only to an entry survey did not bias the final analytic sample.

On average, the student populations of the 295 student teaching schools in the final sample were 12% White, 38% African American, 44% Hispanic, and 5% Asian American. Because district schools are quite segregated, however, these averages mask considerable variation: Whereas some student teaching schools were composed entirely of African American or Hispanic students, other schools were

**Table 1**
***Summary Statistics on Student Teachers, by Survey Response***

| | *All student teachers* | *Entry-only respondents* | *Entry and exit respondents* |
|---|---|---|---|
| *Proportion student teachers* | | | |
| Female | 0.80 | 0.78 | 0.81 |
| Race | | | |
| White | 0.65 | 0.65 | 0.65 |
| African American | 0.12 | 0.13 | 0.12 |
| Hispanic/Latino | 0.14 | 0.14 | 0.15 |
| Asian American | 0.06 | 0.07 | 0.06 |
| Native American/other | 0.02 | 0.02 | 0.03 |
| Age (years) | | | |
| 21–23 | 0.33 | 0.33 | 0.33 |
| 24–26 | 0.22 | 0.24 | 0.21 |
| 27–31 | 0.23 | 0.26 | 0.21* |
| ≥32 | 0.22 | 0.16 | 0.25*** |
| Expected degree | | | |
| Bachelor's | 0.54 | 0.56 | 0.53 |
| Master's | 0.40 | 0.39 | 0.40 |
| Other | 0.06 | 0.05 | 0.07+ |
| Area of certification | | | |
| PreK–3 (early childhood) | 0.10 | 0.09 | 0.10 |
| K–9 | 0.45 | 0.45 | 0.46 |
| 6–12 | 0.18 | 0.17 | 0.18 |
| 9–12 | 0.07 | 0.08 | 0.07 |
| K-12 | 0.18 | 0.20 | 0.18 |
| Other | 0.01 | 0.02 | 0.01 |
| Area of high school graduation | | | |
| Urban | 0.37 | 0.35 | 0.37 |
| Suburban | 0.50 | 0.50 | 0.51 |
| Rural | 0.09 | 0.11 | 0.08* |
| Outside of United States | 0.03 | 0.03 | 0.03 |
| Obtained GED | 0.01 | 0.01 | 0.01 |
| District high school grad | 0.31 | 0.29 | 0.32 |
| District was first choice | 0.87 | 0.87 | 0.86 |
| Required to student teach in district | 0.26 | 0.25 | 0.26 |
| Influence on deciding student teaching school | | | |
| None | 0.33 | – | 0.33 |
| Some | 0.55 | – | 0.55 |
| Complete | 0.12 | – | 0.12 |
| Student teachers, *n* | 1,653 | 651 | 1,002 |

Note. Significance levels are from tests of equality between "entry only" and "entry and exit" columns. Information on student teachers' influence on determining their student teaching schools was gathered only at exit.
+$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

as much as 80% White. Average school achievement also varied greatly among student teaching schools, with the average test scores of some student teaching schools falling nearly 2 standard deviations above the state mean and those of other schools falling 1 full standard deviation below the state average. Teacher stability rates in student teaching schools ranged from 56% to 96%, with an average of 84% and a standard deviation of 6.5%.

**Table 2**

***Summary Statistics on Student Teaching Schools, by Survey Response***

| | *All student teachers* | *Entry-only respondents* | *Entry and exit respondents* |
|---|---|---|---|
| *Student characteristics* | | | |
| White | 0.11 | 0.15 | 0.12* |
| | (0.17) | (0.19) | (0.17) |
| African American | 0.41 | 0.36 | 0.38 |
| | (0.40) | (0.38) | (0.39) |
| Hispanic | 0.42 | 0.42 | 0.44 |
| | (0.36) | (0.34) | (0.35) |
| Asian American | 0.04 | 0.06 | 0.05 |
| | (0.09) | (0.11) | (0.10) |
| Native American | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.01) | (0.00) |
| With IEP | 0.13 | 0.14 | 0.13 |
| | (0.11) | (0.14) | (0.12) |
| LEP | 0.15 | 0.14 | 0.16 |
| | (0.16) | (0.14) | (0.16) |
| FRPL | 0.80 | 0.76 | 0.79 |
| | (0.22) | (0.23) | (0.22) |
| Proportion elementary schools | 0.84 | 0.79 | 0.83 |
| | (0.37) | (0.41) | (0.38) |
| *Average school characteristics* | | | |
| School size (membership) | 776 | 823 | 801 |
| | (536) | (595) | (552) |
| Test score[a] | −0.30 | −0.23 | −0.28 |
| | (0.50) | (0.55) | (0.50) |
| Average teacher stability, 2003–2006 | 83.1 | 83.7 | 83.5 |
| | (6.6) | (6.3) | (6.5) |
| Schools, *n* | 333 | 192 | 295 |

Note. Standard deviations in parentheses. Significance levels are from tests of equality between "entry only" and "entry and exit" columns. [a]Average reading/math score in 2008–2009 (standardized using state mean/SD). FRPL = Free or Reduced Price Lunch. IEP = Individual Education Plan. LEP = Limited English Proficient.

+$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

### *Instrumentation*

**Measures of school working conditions**. This study used three separate measures of the working conditions of student teaching schools. The first two measures were based on factor analysis of survey items that asked student teachers about the working conditions of their student teaching schools. School working conditions Factor 1 was based on student teachers' responses to a survey question that asked them to indicate their agreement or disagreement with a series of statements about their student teaching experiences; student teachers rated their agreement or disagreement on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Five of the items loaded onto a single factor, which measured how welcomed and included student teachers felt at their student teaching schools. The items included in this first factor, along with their factor loadings, are listed in the top panel of Table 3. Student teachers generally reported that they felt very welcomed and included at their student teaching schools ($M = 4.30$, $SD = .62$).

School working conditions Factor 2, which is described in the bottom panel of Table 3, was based on factor analysis of a survey question that asked student

**Table 3**
***School Working Conditions Factors***

Working conditions Factor 1: *Please indicate the degree to which you agree with the following statements about your student teaching experience*.[a]

| | *Factor Loadings* | *Eigenvalue* | *Alpha* |
|---|---|---|---|
| I felt included in daily activities of the school. | 0.70 | 2.15 | 0.77 |
| I felt welcomed and supported by the principal. | 0.61 | | |
| I felt welcomed and supported by the community of teachers. | 0.70 | | |
| I felt welcomed by the students. | 0.64 | | |
| My students responded in a positive manner to my teaching. | 0.62 | | |

Working conditions Factor 2: *Please indicate your satisfaction with the following aspects of your student teaching experience*.[b]

| | *Factor Loadings* | *Eigenvalue* | *Alpha* |
|---|---|---|---|
| The principal at your placement school. | 0.64 | 1.53 | 0.77 |
| The other teachers and staff at your placement school. | 0.73 | | |
| Your placement school. | 0.77 | | |

[a]5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).
[b]7-point Likert scale, ranging from 1 (completely dissatisfied) to 7 (completely satisfied).

teachers to rate their satisfaction with various aspects of their student teaching experience on a 7-point Likert-type scale ranging from 1 (*completely dissatisfied*) to 7 (*completely satisfied*). Three of the items from this question—those that asked student teachers about their satisfaction with their principals, other teachers and staff, and their placement schools—pertained to the working conditions of student teaching schools and loaded onto a single factor. Student teachers were generally quite satisfied with the working conditions of their student teaching schools, although there was significant variation in their satisfaction ($M = 5.94$, $SD = 1.08$). To generate overall measures of school working conditions, factor scores for each of the two factors were averaged across all student teachers in each school. Because the working conditions factors were based on responses to the exit survey, student teachers' own ratings of their school's working conditions were excluded from these averages; in other words, student teachers were each assigned a measure of their school workplace that averaged the scores on these factors given by all other student teachers in the school over the 2 years of the study. Student teachers in schools that hosted a single student teacher during the 2 years covered by the data were thus excluded from analyses that used the working conditions factors.

The third measure of school working conditions was based on the 1-year teacher stability rates of district schools for the years 2003–2004 through 2006–2007, which were described earlier. Prior work has used similar measures of teacher stability as proxies for school working conditions (Ronfeldt, 2012; Ronfeldt et al., 2013).[9] To generate an overall measure of teacher stability, each school's 1-year teacher stability rates were averaged over the 4 years for which data were available to create an average year-to-year stability rate; unless otherwise mentioned, references to "stability rate" refer to this average.[10]

For some analyses, student teaching schools were divided into quartiles based on their school working conditions. The purpose of these analyses was to examine whether the level of a school's working conditions predicted changes in student teachers' planned persistence, as opposed to small, one-unit changes in working conditions, as examined in other work (Ronfeldt et al., 2013). These analyses thus enabled a comparison of changes in planned persistence for student teachers in schools with the most challenging working conditions compared to those with the least challenging working conditions. These schools were starkly different workplaces, as shown in Table 4, which shows descriptive statistics on student teaching schools in each of the four quartiles of stability rate, ranging from schools with the lowest teacher stability (Column 1) to the highest (Column 4). Schools in the lowest quartile of teacher stability lost, on average, 1 of 4 of their teachers each year, while schools in the highest quartile of teacher stability lost only 1 in 10. Schools with the lowest teacher stability had significantly smaller proportions of White and Asian American students and larger proportions of African American students than schools with the highest level of teacher stability. Schools with the lowest teacher stability rates were also generally smaller and lower achieving schools than schools with higher teacher

stability. Appendices B and C similarly show that student teaching schools in the lowest quartile of perceived working conditions (Factors 1 and 2) were lower achieving schools with lower teacher stability than schools with more highly rated working conditions.

**Table 4**

***Summary Statistics on Student Teaching Schools, by Quartile of Teacher Stability Rate of Student Teaching School***

| | *Quartile 1 (most turnover)* | *Quartile 2* | *Quartile 3* | *Quartile 4 (least turnover)* |
|---|---|---|---|---|
| *Student characteristics* | | | | |
| White | 0.07 | 0.10 | 0.12* | 0.22*** |
| | (0.12) | (0.16) | (0.17) | (0.19) |
| African American | 0.56 | 0.41* | 0.30** | 0.14*** |
| | (0.40) | (0.39) | (0.35) | (0.24) |
| Hispanic | 0.33 | 0.44$^{+}$ | 0.48* | 0.53** |
| | (0.36) | (0.34) | (0.37) | (0.31) |
| Asian American | 0.02 | 0.03 | 0.07* | 0.09*** |
| | (0.05) | (0.05) | (0.14) | (0.11) |
| Native American | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.01) |
| With IEP | 0.12 | 0.13 | 0.11* | 0.12 |
| | (0.05) | (0.05) | (0.04) | (0.06) |
| LEP | 0.12 | 0.16 | 0.20* | 0.20** |
| | (0.16) | (0.15) | (0.17) | (0.14) |
| FRPL | 0.84 | 0.81 | 0.78 | 0.72** |
| | (0.18) | (0.18) | (0.25) | (0.25) |
| Proportion elementary school | 0.81 | 0.77 | 0.83 | 0.91 |
| | (0.40) | (0.43) | (0.38) | (0.30) |
| Average school size | 662 | 864* | 979** | 902** |
| | (466) | (534) | (671) | (522) |
| Average test score[a] | −0.46 | −0.41 | −0.17*** | −0.01*** |
| | (0.43) | (0.39) | (0.52) | (0.55) |
| Avg. working conditions Factor 1 | 4.30 | 4.23 | 4.44$^{+}$ | 4.40 |
| | (0.47) | (0.55) | (0.44) | (0.42) |
| Avg. working conditions Factor 2 | 5.74 | 5.82 | 6.08* | 6.15** |
| | (0.92) | (0.86) | (0.70) | (0.76) |
| Average teacher stability, 2003–2006 | 74.8 | 82.1*** | 86.0*** | 90.8*** |
| | (5.5) | (1.4) | (1.2) | (1.9) |
| Schools, *n* | 62 | 64 | 66 | 63 |

Note. Significance levels are from tests of equality between Q1 and other columns. FRPL = Free or Reduced Price Lunch. IEP = Individual Education Plan. LEP = Limited English Proficient.

[a]Average reading/math score in 2008–2009 (standardized using state mean/SD).

$^{+}p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

The student teachers who completed their student teaching in schools in each of these quartiles of stability rate also differed, as can be seen in Table 5. Student teachers in the schools with the lowest teacher stability were significantly more likely to be African American than student teachers in schools with higher teacher stability rates; they were also significantly more likely to have been required by their preparation programs to student teach in the district. Interestingly, as can be seen in Appendices D and E, student teachers in schools in the highest quartile of perceived working conditions were more likely to be African American than student teachers in schools with lower perceived working conditions. This may be due to the fact that African American student teachers were more likely to be only one of two student teachers placed in their schools. To account for differences in these student teacher characteristics, the variables in Tables 4 and 5 are included as controls in all analyses.

**Measures of planned persistence**. Student teachers' planned persistence in education, teaching, and the district where they student taught was measured using their answers to three survey questions, all of which were asked on both entry and exit surveys. These questions asked, "How long do you plan on working in education (in any capacity)?" "How long do you plan to teach?" and "How long do you plan to teach in [the district]?" For each question, student teachers chose from the following replies: "Not at all"; "1–2 years"; "3–5 years"; "6–10 years"; "11 or more years"; or "My entire working life." Student teachers' responses at entry and exit were used to create a measure of the direction of changes in student teachers' planned persistence during student teaching. This variable divided student teachers into three groups: (a) student teachers who changed their planned persistence from a higher number of years to a lower number of years between the entry and exit surveys (a negative change in planned persistence); (b) student teachers who did not change their planned persistence between the two surveys (no change in planned persistence); and (c) student teachers who changed their planned persistence from a lower number of years to a higher number of years between the surveys (a positive change in planned persistence). Analyses focused on the direction of changes in planned persistence, as opposed to the magnitude of those changes, because directional analyses rely less on the assumption that a one-category change is equivalent across the scale.

### *Data Analysis*

Analyses consisted of a series of ordered logistic regressions, using the direction of changes in student teachers' planned persistence (negative, no change, or positive) in either education, teaching, or the district as the dependent variable, depending on the analysis. Ordered logistic regressions were appropriate because, although the dependent variable was ordered, it was reasonable to believe that the distances between the categories were unknown, and the ordered logistic regression

**Table 5**

***Summary Statistics on Student Teachers, by Quartile of Teacher Stability Rate of Student Teaching School***

| | *Quartile 1 (most turnover)* | *Quartile 2* | *Quartile 3* | *Quartile 4 (least turnover)* |
|---|---|---|---|---|
| Female | 0.84 | 0.77 | 0.82 | 0.85 |
| Race | | | | |
| White | 0.60 | 0.68$^{+}$ | 0.63 | 0.70* |
| African American | 0.21 | 0.11** | 0.08*** | 0.09** |
| Hispanic/Latino | 0.14 | 0.15 | 0.17 | 0.13 |
| Asian American | 0.05 | 0.04 | 0.09 | 0.05 |
| Native American/other | 0.01 | 0.02 | 0.03 | 0.03 |
| Age (years) | | | | |
| 21–23 | 0.31 | 0.38 | 0.30 | 0.33 |
| 24–26 | 0.18 | 0.20 | 0.23 | 0.21 |
| 27–31 | 0.24 | 0.19 | 0.23 | 0.19 |
| ≥32 | 0.26 | 0.23 | 0.25 | 0.26 |
| Expected degree | | | | |
| Bachelor's | 0.55 | 0.53 | 0.50 | 0.59 |
| Master's | 0.35 | 0.38 | 0.45$^{+}$ | 0.35 |
| Other | 0.10 | 0.09 | 0.05$^{+}$ | 0.06 |
| Area of certification | | | | |
| PreK–3 (early childhood) | 0.13 | 0.08$^{+}$ | 0.07* | 0.13 |
| K–9 | 0.56 | 0.35*** | 0.47$^{+}$ | 0.57 |
| 6–12 | 0.14 | 0.25** | 0.19 | 0.11 |
| 9–12 | 0.04 | 0.10* | 0.06 | 0.04 |
| K–12 | 0.13 | 0.21* | 0.19$^{+}$ | 0.14 |
| Other | 0.00 | 0.01 | 0.02 | 0.01 |
| Area of high school graduation | | | | |
| Urban | 0.33 | 0.39 | 0.33 | 0.41 |
| Suburban | 0.52 | 0.50 | 0.54 | 0.48 |
| Rural | 0.10 | 0.08 | 0.07 | 0.07 |
| Outside of United States | 0.04 | 0.02 | 0.04 | 0.02 |
| Obtained GED | 0.02 | 0.01 | 0.02 | 0.01 |
| District high school grad | 0.28 | 0.32 | 0.28 | 0.36 |
| District was first choice | 0.86 | 0.86 | 0.88 | 0.86 |
| Required to student teach in district | 0.34 | 0.23* | 0.26$^{+}$ | 0.25$^{+}$ |
| Influence on deciding student teaching school | | | | |
| None | 0.35 | 0.34 | 0.29 | 0.38 |
| Some | 0.55 | 0.55 | 0.57 | 0.53 |
| Complete | 0.10 | 0.11 | 0.14 | 0.09 |
| Student teachers, *n* | 151 | 242 | 268 | 259 |

Note. Significance levels are from tests of equality between Q1 and other columns.
$^{+}p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

model does not assume that the distances between the categories are equal (Long & Freese, 2006). Heteroskedastic-robust standard errors were calculated for all analyses.

The basic model of the direction of change in student teachers' planned persistence in the district was as follows (models for planned persistence in education and teaching were similar):

$$\Pr(dirchandist = m|x_i) = F(\tau - x\beta) - F(\tau_{m-1} - x\beta)$$

where

$$x\beta = \beta_1 female + \beta_2 age + \beta_3 areaHSgrad + \beta_4 race + \beta_5 certification + \beta_6 degree + \beta_7 firstchoice + \beta_8 reqdist + \beta_9 influ$$

and the covariates were those listed in Table 1. A second analysis added a series of school-level measures for student teaching schools to the model; these covariates are listed in Table 2. The final analyses added measures of school working conditions—either the first or second working conditions factor described previously or schools' average teacher stability rates—to the regressions. These working conditions measures were defined continuously or divided into quartiles, depending on the analysis.

## Results

### *Changes in Student Teachers' Planned Persistence During Student Teaching*

To answer our first research question, which asks whether and in what direction student teachers' planned persistence changes during student teaching, Table 6 provides both counts and proportions of student teachers whose planned persistence in the district, teaching, and education changed negatively, positively, or not at all during student teaching. The table also includes these counts and proportions for the subgroup of student teachers who changed their planned persistence to "not at all" during student teaching. Student teachers' plans for teaching in the district, which are shown in the top panel of the table, changed a great deal during student teaching: Comparing planned persistence at the beginning and end of student teaching, only 47% of student teachers did not change the length of time they planned on teaching in the district. The middle panel of the table shows that student teachers' plans for the lengths of time they planned to teach remained relatively consistent, with 61% of student teachers not changing the length of time they planned on teaching during their careers. Student teachers' plans for working in the field of education, which are presented in the bottom panel of the table, remained largely unchanged during student teaching: 74% of student teachers did not change the length of time they planned on working in education during student teaching.[11]

Among those student teachers who changed their planned persistence during student teaching, a slightly greater proportion of student teachers changed their

career plans negatively than positively. For plans for teaching in the district, for example, 29% of student teachers changed their career plans in a negative direction, while 24% changed their career plans positively. Similar differences are apparent for teaching and working in education.

### *Working Conditions and Changes in Planned Persistence during Student Teaching*

To answer our second research question, we first examined whether student teachers' planned persistence changed differently in student teaching schools with various levels of working conditions. No clear patterns were found in changes in planned persistence across the four quartiles of school working conditions Factor 1 or 2. Table 7 presents the direction of changes in student teachers' planned persistence in the district, teaching, and in education by the quartile of the teacher stability rate of their student teaching schools. The top panel of the table suggests that changes in plans for teaching in the district were unrelated to the working conditions of student teaching schools, as measured by teacher stability. The middle panel of the table, however, shows a clear monotonic relationship between the quartile of stability rate of student teaching schools and changes in student

**Table 6**

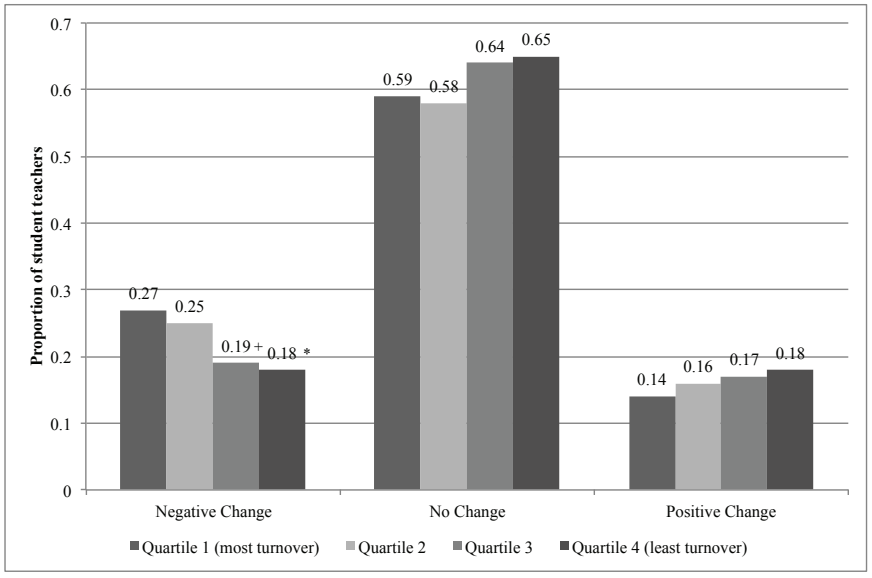
***Direction of Changes in Planned Persistence During Student Teaching***

| | *All student teachers* | | *Excluding student teachers who replied "Not at all" at entry* | |
|---|---|---|---|---|
| | *Frequency* | *Proportion* | *Frequency* | *Proportion* |
| How long you plan to teach in district | | | | |
| Negative change | 246 | 0.29 | 246 | 0.31 |
| *Changed to "Not at all"* | *74* | *0.09* | *74* | *0.09* |
| No change | 402 | 0.47 | 351 | 0.44 |
| Positive change | 208 | 0.24 | 192 | 0.24 |
| How long you plan to teach | | | | |
| Negative change | 194 | 0.22 | 194 | 0.22 |
| *Changed to "Not at all"* | *6* | *0.01* | *6* | *0.01* |
| No change | 537 | 0.61 | 532 | 0.61 |
| Positive change | 149 | 0.17 | 146 | 0.17 |
| How long you plan to work in education | | | | |
| Negative change | 132 | 0.15 | 132 | 0.15 |
| *Changed to "Not at all"* | *1* | *0.00* | *1* | *0.00* |
| No change | 650 | 0.74 | 648 | 0.74 |
| Positive change | 99 | 0.11 | 98 | 0.11 |

teachers' planned persistence in teaching. As the working conditions of student teaching schools improved, the percentage of student teachers who negatively changed their planned persistence in teaching decreased monotonically, while the percentage who changed their plans positively increased. Twenty-seven percent of student teachers in schools with the most challenging working conditions negatively changed their planned persistence, as opposed to only 18% of student teachers in the schools with the least challenging working conditions, a difference that was statistically significant, $p = .04$. This relationship is illustrated by Figure 1, which shows the percentage of student teachers in schools with various levels of teacher stability who reported negative changes, no changes, and positive changes in their planned persistence in teaching. The figure also suggests that planned persistence in teaching was more stable in schools with better working conditions, as student teachers in schools with higher teacher stability were more likely not to change their planned persistence in teaching. The same is generally true for changes in planned persistence in education, as can be seen in the bottom panel of Table 7, although the percentage of student teachers in each group can generally not be statistically distinguished from one another.

**Figure 1**

***Direction of Changes in Student Teachers' Planned Persistence in Teaching, by Teacher Stability Rate of Student Teaching School.***




Note. Significance Levels Are from Tests of Equality between Q1 and Other Columns.
+ p < 0.10, *p < 0.05.

### *Predicting Changes in Student Teachers' Planned Persistence in Teaching*

To further explore our second research question, we conducted a series of ordered logistic regressions to determine whether the working conditions of student teaching schools predicted the direction of changes in student teachers' planned persistence in education, teaching, or the district. School working condition Factors 1 and 2, when entered separately into ordered logistic regressions—as either continuous measures or divided into quartiles—did not significantly predict the direction of changes in any measure of student teachers' planned persistence. Teacher stability rates, however, significantly predicted changes in career plans in some models. Table 8 shows results from ordered logistic regressions that used student teacher and student teaching school characteristics, as well as the teacher stability rates of student teaching schools, to predict the direction of changes in student teachers' planned persistence in teaching. Each regression in the table adds new predictor variables to the model: student teacher characteristics (Model 1); school characteristics (Model 2); the teacher stability rate of student teaching schools, entered as a continuous variable (Model 3); and the quartile of the teacher stability rate of student teaching schools (Model 4). The coefficients reported in the table are odds ratios, so numbers less than 1 indicate negative associations, while those

**Table 7**

***Direction of Changes in Student Teachers' Planned Persistence During Student Teaching, by Teacher Stability Rate of Student Teaching School***

| | *Quartile of stability rate of student teaching school* | | | |
|---|---|---|---|---|
| | *Quartile 1 (most turnover)* | *Quartile 2* | *Quartile 3* | *Quartile 4 (least turnover)* |
| How long do you plan to ... | | | | |
| ... teach in the district | | | | |
| Negative change | 0.28 | 0.30 | 0.26 | 0.31 |
| No change | 0.52 | 0.44 | 0.47 | 0.49 |
| Positive change | 0.20 | 0.26 | 0.27 | 0.20 |
| ... teach | | | | |
| Negative change | 0.27 | 0.25 | 0.19$^{+}$ | 0.18* |
| No change | 0.59 | 0.58 | 0.64 | 0.65 |
| Positive change | 0.14 | 0.16 | 0.17 | 0.18 |
| ... work in education | | | | |
| Negative change | 0.18 | 0.19 | 0.12 | 0.14 |
| No change | 0.68 | 0.69 | 0.78* | 0.75 |
| Positive change | 0.14 | 0.11 | 0.10 | 0.11 |

Note. Within each section, proportions represent column proportions. Significance levels are from tests of equality between Q1 and other columns.
$^{+}p < .10$. $*p < .05$.

above 1 indicate positive associations. Although all the variables in Tables 1 and 2 are included in the models, only selected coefficients are reported in the table, in the interest of parsimony.

Model 1 shows that a variety of certification levels were associated with a significantly decreased likelihood of increases in planned persistence in teaching, compared

**Table 8**

***Associations Between Selected Student Teacher and Student Teaching School Characteristics and Changes in Planned Persistence in Teaching During Student Teaching***

| *Direction of change in how long you plan to teach* | *Model 1: Student teacher characteristics* | *Model 2: School characteristics* | *Model 3: Teacher stability rate (continuous)* | *Model 4: Teacher stability rate (quartiles)* |
|---|---|---|---|---|
| | *Odds ratio (z)* | *Odds ratio (z)* | *Odds ratio (z)* | *Odds ratio (z)* |
| Obtained GED | 2.682+ | 2.861+ | 2.938* | 2.926* |
| | (1.83) | (1.95) | (2.00) | (2.02) |
| PreK–3 certification | 0.638* | 0.611* | 0.607* | 0.600* |
| | (−2.01) | (−2.12) | (−2.14) | (−2.15) |
| 6–12 certifcation | 0.528* | 0.667 | 0.643 | 0.633 |
| | (−2.28) | (−1.16) | (−1.26) | (−1.30) |
| 9–12 certification | 0.444* | 0.577 | 0.554 | 0.538 |
| | (−2.14) | (−1.20) | (−1.28) | (−1.35) |
| K–12 certification | 0.559* | 0.644 | 0.628 | 0.627 |
| | (−2.15) | (−1.40) | (−1.47) | (−1.48) |
| District was first choice | 0.681 | 0.642+ | 0.632+ | 0.629* |
| | (−1.63) | (−1.87) | (−1.94) | (−1.96) |
| Required to student teach in dist. | 0.681* | 0.654** | 0.656* | 0.667* |
| | (−2.40) | (−2.59) | (−2.55) | (−2.43) |
| Some influence | 1.194 | 1.265 | 1.280 | 1.271 |
| | (1.07) | (1.39) | (1.46) | (1.41) |
| Complete influence | 1.563+ | 1.598+ | 1.595+ | 1.596+ |
| | (1.75) | (1.79) | (1.77) | (1.78) |
| % IEP | | 0.945** | 0.944** | 0.944** |
| | | (−2.83) | (−2.85) | (−2.83) |
| Teacher stability | | | 1.022 | |
| | | | (1.21) | |
| Teacher stability rate, Q2 | | | | 1.276 |
| | | | | (0.95) |
| Teacher stability rate, Q3 | | | | 1.396 |
| | | | | (1.27) |
| Teacher stability rate, Q4 | | | | 1.625+ |
| | | | | (1.83) |

Note. $n$ = 771. Coefficients for selected student teacher and school characteristics reported. IEP = Individual Education Plan.
$^{+}p < .10$. $*p < .05$. $**p < .01$.

to early childhood certification, the omitted category. Model 1 also shows that being required to student teach in the district was also associated with a significantly decreased likelihood of having a positive change in planned persistence in teaching, $p = .02$. This association remained statistically significant when school characteristics were added in Model 2, $p = .01$. Model 2 also shows that, even after controlling for a variety of other school characteristics, the percentage of students at the student teaching school with an Individual Education Plan (IEP) significantly predicted changes in student teachers' planned persistence in teaching. The odds of a positive change in career plans were reduced by a factor of .95 for every percentage increase in the percentage of students with an IEP at the student teaching school, $p = .01$.[12]

Model 3 of Table 8 shows that unit increases in the average teacher stability rate of student teaching schools did not significantly predict changes in student teachers' planned persistence in teaching; Model 4, however, shows that student teaching in a school with the most challenging working conditions was marginally significantly associated with a lower likelihood of a positive change in planned persistence in teaching, even after controlling for a variety of student teacher and student teaching school characteristics. Compared to student teachers in schools in the lowest quartile of stability rate, student teachers at schools in the top quartile of stability rate were 1.63 times more likely to experience positive changes in their planned persistence in teaching, $p = .07$. Model 4 of Table 8 also shows that, even after controlling for student teacher and student teaching school characteristics, the likelihood of a positive change in planned persistence increased monotonically from Quartiles 1 through 4, suggesting that—although these analyses were unable to statistically distinguish between these results—changes in student teachers' planned persistence were increasingly distinct from those of student teachers in the schools with the most challenging working conditions.

To test whether this finding was robust to various specifications of the stability rate, school stability rates were divided into deciles, as well as above or below the median, and substituted for the quartiles of stability rate in separate regressions. No statistically significant distinctions were found between changes in planned persistence for student teachers at schools in various deciles of school stability rates, nor were significant differences found for student teachers in schools either above or below the median of stability rate. In the first instance, the smaller number of student teachers in each decile may have rendered it difficult to statistically distinguish between the career plans of student teachers in these groups; in the second instance, the distinction between above and below the median may have been too broad to find any meaningful differences.

## Discussion

The analyses presented here suggest that school working conditions are meaningful predictors of changes in student teachers' planned persistence in teaching.

When school working conditions are measured using the stability rates of student teaching schools, student teaching in a school with the most challenging working conditions is associated with a reduction in the number of years student teachers plan to teach, even after controlling for a variety of student teacher, preparation program, and school characteristics.

Why might school working conditions be associated with changes in student teachers' planned persistence in teaching, but not in the district? One possibility is that the working conditions of student teaching schools may matter as student teachers weigh their plans for the lengths of time they plan to teach, but their plans for teaching in the district may be influenced by other factors. While planned persistence in teaching may be sensitive to the working conditions of student teaching schools, plans for working in the district may instead be determined by preferences to teach close to home or in a similar environment to where student teachers themselves were educated, consistent with prior research (Boyd, Lankford, Loeb, & Wyckoff, 2005; Reininger, 2012).

This study also finds that student teachers' planned persistence—particularly their planned persistence in the urban district where they student teach—changes a great deal during student teaching. Nearly 10% of student teachers begin student teaching planning on teaching in this urban district but leave student teaching planning on never teaching there during their careers. Whether these findings are a concern from a policy perspective, however, depends on whether the student teachers who are discouraged from seeking employment in the district would have made committed and effective urban teachers had they remained. Research on realistic job previews has suggested that some attrition of job applicants after a realistic job preview may benefit the organization, both by helping applicants decide whether a particular job is good for them and by shaping the pool of applicants in favor of those already inclined to like the job and perhaps do well (Breaugh, 1983). This explains why realistic job previews are associated with increased organizational commitment, job satisfaction, performance, and job survival for those who do remain, compared to other employees (Premack & Wanous, 1985).

Given these findings, it is possible that the student teachers who decide during student teaching never to teach in the district are those who would have not been committed and effective urban teachers in the first place. By discouraging these student teachers from teaching in the district, student teaching may lead to a teacher workforce that is more committed and satisfied and thus may benefit, rather than harm, students and schools in large urban districts. Because this study does not follow student teachers into the labor force, nor include a measure of their later effectiveness, it is impossible to determine whether those student teachers who negatively change their planned persistence in the district would have made committed and effective urban teachers. Future research that compares the career paths and effectiveness of student teachers who change their career plans in various ways during student teaching would contribute to our understanding of this question.

The fact that many student teachers' career plans change during student teaching does suggest that there may be significant opportunities for urban districts to recruit student teachers as full-time teachers. For example, this study finds that a full 24% of student teachers who enter student teaching planning on never teaching in the district leave student teaching planning on teaching there for some length of time. Although these student teachers are insufficient to make up for those student teachers who decide during student teaching never to teach in the district, they hint at a potential opportunity for urban districts to recruit student teachers during the course of student teaching. This is a promising avenue for policy, because these student teachers may turn out to be particularly committed to the district and perhaps even particularly likely to be effective teachers. Recent research has suggested that many schools may already be using student teaching as a time to evaluate potential hires, as many student teachers are hired in the schools where they student teach (Goldhaber et al., 2013; Ronfeldt, 2012).

The regression analyses included here also find that a number of student teacher and school characteristics are associated with changes in planned persistence, particularly in teaching. One particularly interesting finding is that increases in the percentage of students with an IEP at student teaching schools are associated with decreased odds of positive changes in planned persistence in teaching. One explanation for this finding is that working in schools with large percentages of students with identified disabilities is particularly challenging for student teachers and leads them to reconsider the lengths of their teaching careers. Another possibility is that the percentage of students with IEPs signals aspects of school climate or working conditions that themselves may be associated with negative changes in student teachers' career plans.

This study had several limitations. First, these analyses examined only associations between the direction of change in student teachers' planned persistence and aspects of student teaching, so results should not be interpreted causally. Second, this study measured school working conditions using student teachers' perceptions of student teaching schools as well as their teacher stability rates, which may be imperfect proxies for the school working conditions (or other aspects of schools) that may most strongly relate to changes in the planned persistence of student teachers. Finally, it is important to note that this study explored the relationship between the working conditions of student teaching schools and changes in planned persistence in a single urban district, and the findings may not generalize to smaller districts or to other contexts.

The findings of this study suggest several potentially fruitful directions for further research. As discussed earlier, research that follows student teachers not just during student teaching but also into their early careers would help us better understand the relationships between a variety of aspects of student teaching experiences and the trajectories of teachers' early careers. Second, qualitative research that more closely seeks to understand the ways that student teachers interact (and do not interact) with their placement schools would help build theory about ex-

actly how we might expect student teaching schools to influence student teachers. Finally, understanding how student teaching schools are chosen—across a variety of different types of programs and contexts—would also provide insight into the processes explored here.

A great deal of recent research has concluded that school working conditions are important predictors of a variety of in-service teacher outcomes, particularly teacher turnover and attrition (Ingersoll, 2001; Jackson, 2009; Johnson & Birkeland, 2003; Ladd, 2011; Loeb et al., 2005). This study is the first to explore in detail whether the working conditions of student teaching schools are similarly predictive of important outcomes for student teachers. Prior work has argued for the importance of the school contexts where student teachers learn to teach (Grossman et al., 2012), and this study provides empirical evidence that student teaching schools—in addition to other aspects of student teaching, such as cooperating teachers and quality of supervision—predict important student teacher outcomes. The findings of this study should encourage researchers, policy makers, and urban school districts to further investigate the workplace experiences of student teachers, as their experiences may have significant implications for the staffing of urban schools—and for these teachers' future careers.

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## Notes

[1] Authors' calculations using the 2007–2008 Schools and Staffing Survey.

[2] The district is uninvolved, however, in determining the specific schools where student teachers are placed; this is left up to teacher preparation programs and student teachers, who develop relationships with individual schools.

[3] The open-response items asked student teachers to detail aspects of their student teaching experiences, but because these items had low response rates, we chose to concentrate our analysis on other survey items.

[4] Examples and more information on these surveys can be found at http://cepa.stanford.edu/sites/default/files/Alt_Cert_Survey_Summer_2004.pdf and http://web.stanford.edu/group/suse-crc/cgi-bin/drupal/survey-instruments

[5] Because this calculation likely includes some nonrespondents who did not in fact student teach in the district, these response rates can be considered lower bounds.

[6] Some student teachers who completed the entry survey later indicated that they did not complete student teaching in the district and so did not receive an exit survey.

[7] Respondents were significantly more likely to be women than nonrespondents were ($p$

= .03), although the magnitude of this difference was not great (80% of survey respondents were women, compared to 76% of nonrespondents).

[8] One exception was that older student teachers were significantly more likely to complete both surveys than younger student teachers were.

[9] Although these stability rates focus on the years preceding the study period, the time periods examined by the two studies are only a year apart, and no significant changes in district policy related to teacher staffing occurred in the intervening year.

[10] The 82 student teachers who student taught in charter schools or schools that opened after 2002–2003 were excluded from all analyses, as teacher stability rates were unavailable for these schools.

[11] Of these student teachers, most (64%) planned on working in education for their entire working lives at both the beginning and the end of student teaching. Because student teachers' planned persistence in education changed relatively little during student teaching, changes in planned persistence in education are not examined in the regression models that follow. Results are available upon request.

[12] The distribution of the percentage of students with an IEP at student teaching schools was heavily right skewed, with several student teaching schools reporting IEP percentages of over 50%. We conducted our analyses excluding student teachers in schools whose percentages of students with an IEP were above the 99th percentile of the distribution (51.5%) or 95th percentile (21.1%), and the results remained qualitatively similar to those reported here.

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## Appendix A

### *Survey Response Rates*

| | *Fall 2008* | | *Spring 2009* | | *Fall 2009* | | *Spring 2010* | |
|---|---|---|---|---|---|---|---|---|
| | *Entry* | *Exit* | *Entry* | *Exit* | *Entry* | *Exit* | *Entry* | *Exit* |
| Surveys sent | 660 | 311 | 910 | 501 | 675 | 349 | 1209 | 492 |
| Responses | 326 | 207 | 532 | 287 | 367 | 233 | 539 | 275 |
| Response rate (%) | 0.49 | 0.67 | 0.58 | 0.57 | 0.54 | 0.67 | 0.45 | 0.56 |

Note. Exits were conditional on responding to entry survey.

## Appendix B

***Summary Statistics on Student Teaching Schools, by Quartile of School Working Conditions Factor 1***

| | *Quartile 1 (Lowest rated SWCs)* | *Quartile 2* | *Quartile 3* | *Quartile 4 (Highest rated SWCs)* |
|---|---|---|---|---|
| Proportion students | | | | |
| White | 0.09 | 0.17* | 0.14$^{+}$ | 0.10 |
| | (0.14) | (0.20) | (0.18) | (0.16) |
| African American | 0.41 | 0.32 | 0.35 | 0.40 |
| | (0.36) | (0.36) | (0.37) | (0.42) |
| Hispanic | 0.44 | 0.41 | 0.44 | 0.45 |
| | (0.34) | (0.33) | (0.35) | (0.38) |
| Asian American | 0.03 | 0.09* | 0.05 | 0.03 |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Native American | 0.00 | 0.00* | 0.00* | 0.00$^{+}$ |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| With IEP | 0.14 | 0.16 | 0.14 | 0.11* |
| | (0.11) | (0.18) | (0.12) | (0.05) |
| LEP | 0.14 | 0.16 | 0.16 | 0.18 |
| | (0.14) | (0.17) | (0.16) | (0.17) |
| FRPL | 0.82 | 0.73* | 0.75$^{+}$ | 0.81 |
| | (0.19) | (0.25) | (0.24) | (0.20) |
| Elementary school | 0.75 | 0.68 | 0.85 | 0.94*** |
| | (0.44) | (0.47) | (0.36) | (0.23) |
| School size (membership) | 822 | 888 | 799 | 750 |
| | (578) | (588) | (605) | (478) |
| Test score[a] | −0.48 | −0.15*** | −0.15*** | −0.29** |
| | (0.39) | (0.63) | (0.53) | (0.40) |
| Working conditions Factor 1 | 3.68 | 4.21*** | 4.43*** | 4.82*** |
| | (0.41) | (0.06) | (0.05) | (0.16) |
| Working conditions Factor 2 | 5.14 | 5.76*** | 6.06*** | 6.58*** |
| | (0.92) | (0.58) | (0.41) | (0.46) |
| Average teacher stability, 2003–2006 | 81.7 | 83.5 | 84.7* | 84.0* |
| | (6.7) | (6.3) | (6.5) | (6.4) |
| Schools, *n* | 80 | 52 | 61 | 101 |

Note. Significance levels are from tests of equality between Q1 and other columns. FRPL = free and reduced-price lunch. IEP = Individual Education Plan. LEP = limited English proficient. SWC = school working conditions.

[a]Average reading/math score in 2008–2009 (standardized using state mean/SD).

$^{+}p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

## Appendix C

***Summary Statistics on Student Teaching Schools, by Quartile of School Working Conditions Factor 2***

| | *Quartile 1 (Lowest rated SWCs)* | *Quartile 2* | *Quartile 3* | *Quartile 4 (Highest rated SWCs)* |
|---|---|---|---|---|
| Proportion students | | | | |
| White | 0.09 | 0.14+ | 0.12 | 0.12 |
| | (0.14) | (0.19) | (0.17) | (0.18) |
| African American | 0.38 | 0.38 | 0.40 | 0.36 |
| | (0.38) | (0.37) | (0.37) | (0.41) |
| Hispanic | 0.46 | 0.43 | 0.42 | 0.45 |
| | (0.35) | (0.34) | (0.35) | (0.37) |
| Asian American | 0.06 | 0.04 | 0.05 | 0.05 |
| | (0.13) | (0.06) | (0.07) | (0.10) |
| Native American | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.01) |
| With IEP | 0.13 | 0.16 | 0.14 | 0.11* |
| | (0.11) | (0.16) | (0.13) | (0.04) |
| LEP | 0.17 | 0.14 | 0.14 | 0.18 |
| | (0.15) | (0.14) | (0.16) | (0.18) |
| FRPL | 0.84 | 0.77* | 0.76* | 0.79+ |
| | (0.16) | (0.22) | (0.24) | (0.23) |
| Elementary school | 0.81 | 0.79 | 0.71 | 0.94* |
| | (0.39) | (0.41) | (0.46) | (0.25) |
| School size (membership) | 784 | 814 | 915 | 742 |
| | (485) | (567) | (779) | (402) |
| Test score[a] | −0.43 | −0.29+ | −0.23* | −0.20** |
| | (0.40) | (0.47) | (0.56) | (0.50) |
| Working conditions Factor 1 | 3.86 | 4.29*** | 4.33*** | 4.77*** |
| | (0.50) | (0.34) | (0.41) | (0.25) |
| Working conditions Factor 2 | 4.83 | 5.85*** | 6.25*** | 6.80*** |
| | (0.69) | (0.17) | (0.10) | (0.21) |
| Average teacher stability, 2003–2006 | 81.7 | 82.7 | 84.1* | 85.2*** |
| | (6.8) | (7.6) | (5.6) | (5.5) |
| Schools, *n* | 78 | 74 | 55 | 87 |

Note. Significance levels are from tests of equality between Q1 and other columns. FRPL = free and reduced-price lunch. IEP = Individual Education Plan. LEP = limited English proficient. SWC = school working conditions.

[a]Average reading/math score in 2008–2009 (standardized using state mean/SD).

+p < .10. *p < .05. **p < .01. ***p < .001.

## Appendix D

***Summary Statistics on Student Teachers, by Quartile of Working Conditions Factor 1***

| | *Quartile 1 (Lowest rated SWCs)* | *Quartile 2* | *Quartile 3* | *Quartile 4 (Highest rated SWCs)* |
|---|---|---|---|---|
| Female | 0.80 | 0.80 | 0.78 | 0.86$^{+}$ |
| Race | | | | |
| White | 0.67 | 0.65 | 0.72 | 0.64 |
| African American | 0.05 | 0.11* | 0.05 | 0.17*** |
| Hispanic/Latino | 0.15 | 0.15 | 0.12 | 0.14 |
| Asian American | 0.08 | 0.06 | 0.08 | 0.02** |
| Native American/Other | 0.03 | 0.03 | 0.02 | 0.02 |
| Age (years) | | | | |
| 21–23 | 0.36 | 0.33 | 0.40 | 0.27* |
| 24–26 | 0.20 | 0.18 | 0.23 | 0.24 |
| 27–31 | 0.22 | 0.26 | 0.16 | 0.20 |
| ≥32 | 0.22 | 0.23 | 0.23 | 0.29 |
| Expected degree | | | | |
| Bachelor's | 0.53 | 0.58 | 0.51 | 0.48 |
| Master's | 0.38 | 0.34 | 0.42 | 0.48* |
| Other | 0.08 | 0.08 | 0.07 | 0.04$^{+}$ |
| Area of certification | | | | |
| PreK–3 (early childhood) | 0.06 | 0.09 | 0.09 | 0.16*** |
| K–9 | 0.45 | 0.43 | 0.39 | 0.55* |
| 6–12 | 0.23 | 0.21 | 0.21 | 0.10*** |
| 9–12 | 0.07 | 0.08 | 0.05 | 0.03$^{+}$ |
| K–12 | 0.18 | 0.20 | 0.22 | 0.16 |
| Other | 0.02 | 0.00* | 0.00 | 0.02 |
| Area of high school graduation | | | | |
| Urban | 0.38 | 0.32 | 0.27* | 0.45 |
| Suburban | 0.50 | 0.50 | 0.64** | 0.45 |
| Rural | 0.08 | 0.09 | 0.06 | 0.08 |
| Outside of United States | 0.02 | 0.07* | 0.02 | 0.03 |
| Obtained GED | 0.01 | 0.02 | 0.01 | 0.01 |
| District high school grad | 0.30 | 0.27 | 0.24 | 0.37 |
| District was first choice | 0.84 | 0.85 | 0.89 | 0.90$^{+}$ |
| Req. to student teach in district | 0.22 | 0.26 | 0.23 | 0.32* |
| Influence on deciding student teaching school | | | | |
| None | 0.31 | 0.32 | 0.30 | 0.40* |
| Some | 0.59 | 0.57 | 0.62 | 0.46** |
| Complete | 0.10 | 0.11 | 0.08 | 0.14 |
| Student teachers, *n* | 216 | 221 | 220 | 206 |

Note. Significance levels are from tests of equality between Q1 and other columns. SWC = school working conditions.

$^{+}p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

## Appendix E

***Summary Statistics on Student Teachers, by Quartile of Working Conditions Factor 2***

| | *Quartile 1 (Lowest rated SWCs)* | *Quartile 2* | *Quartile 3* | *Quartile 4 (Highest rated SWCs)* |
|---|---|---|---|---|
| Female | 0.79 | 0.82 | 0.80 | 0.83 |
| Race | | | | |
| White | 0.66 | 0.68 | 0.66 | 0.64 |
| African American | 0.07 | 0.06 | 0.10 | 0.14* |
| Hispanic/Latino | 0.15 | 0.17 | 0.15 | 0.12 |
| Asian American | 0.09 | 0.06 | 0.06 | 0.04* |
| Native American/Other | 0.03 | 0.03 | 0.03 | 0.02 |
| Age (years) | | | | |
| 21–23 | 0.36 | 0.31 | 0.37 | 0.31 |
| 24–26 | 0.19 | 0.20 | 0.24 | 0.22 |
| 27–31 | 0.21 | 0.26 | 0.20 | 0.17 |
| ≥32 | 0.23 | 0.24 | 0.20 | 0.30 |
| Expected degree | | | | |
| Bachelor's | 0.55 | 0.51 | 0.55 | 0.50 |
| Master's | 0.37 | 0.43 | 0.40 | 0.42 |
| Other | 0.08 | 0.07 | 0.05 | 0.08 |
| Area of certification | | | | |
| PreK–3 (early childhood) | 0.08 | 0.09 | 0.11 | 0.10 |
| K–9 | 0.43 | 0.46 | 0.42 | 0.50 |
| 6–12 | 0.26 | 0.20 | 0.17* | 0.13** |
| 9–12 | 0.07 | 0.06 | 0.10 | 0.05 |
| K–12 | 0.16 | 0.19 | 0.20 | 0.20 |
| Other | 0.01 | 0.00 | 0.00 | 0.02 |
| Area of high school graduation | | | | |
| Urban | 0.40 | 0.31$^{+}$ | 0.30* | 0.39 |
| Suburban | 0.49 | 0.53 | 0.58* | 0.50 |
| Rural | 0.08 | 0.07 | 0.09 | 0.08 |
| Outside of United States | 0.02 | 0.06* | 0.02 | 0.03 |
| Obtained GED | 0.02 | 0.02 | 0.00 | 0.00* |
| District high school grad | 0.32 | 0.26 | 0.24$^{+}$ | 0.35 |
| District was first choice | 0.85 | 0.84 | 0.90$^{+}$ | 0.89 |
| Req. to student teach in district | 0.25 | 0.23 | 0.22 | 0.31 |
| Influence on deciding student teaching school | | | | |
| None | 0.36 | 0.31 | 0.29 | 0.36 |
| Some | 0.55 | 0.61 | 0.59 | 0.50 |
| Complete | 0.09 | 0.08 | 0.12 | 0.14$^{+}$ |
| Student teachers, *n* | 217 | 228 | 210 | 212 |

Note. Significance levels are from tests of equality between Q1 and other columns. SWC = school working conditions.

$^{+}p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.