Rethinking Teacher Turnover in Texas:
Longitudinal Measures of Instability in Schools

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What We Studied

Teachers are the most important in-school factor that affect student learning. Yet many schools, particularly low-income urban schools, have a difficult time hiring and retaining teachers. When multiple teachers leave a school each year, multiple years in a row, those schools lose not only human capital, but teachers lose the strong social ties that are vital to creating the type of coherent vision and mission that supports student achievement.

In discussing the problem of turnover, both researchers and policymakers tend to use and report annual turnover rates (i.e. the percentage of teachers who departed from one year to the next). These short-term turnover rates, however, give a limited picture of turnover in that they fail to capture how losses may accumulate in schools over multiple years. In this way, simple, annual teacher turnover rates can conceal deeper, underlying chronic staffing problems in schools. In this policy brief, we present longitudinal measures of teacher turnover that capture how turnover may affect schools over longer periods of time. The way turnover is measured is important, as the measures become the means by which the 'problem' of turnover becomes defined, and its varying dimensions understood. We demonstrate the utility of these measures using data for all teachers in Texas public schools from 2004–2014. We argue that policymakers and district leaders should look to these measures of teacher turnover in order to identify and support schools experiencing the most severe turnover in the state. While the term *turnover* conceptually represents the change in staff from one year to the next, we believe the term *instability* better helps to focus conceptually on impact of staffing change on schools as organizations over time.

How We Analyzed the Data

The primary data source used for the analyses is the database maintained by the Texas Education Research Center (Texas ERC) at the University of Texas at Austin. This data contain statewide, longitudinal, student-level data comprised of P-12 data provided by the Texas Education Agency (TEA) and higher education data provided by the Texas Higher Education Coordinating Board (THECB).

To demonstrate our new measures, we draw on 10 years of administrative data provided by the State of Texas, from 2004 to 2014, housed at the Education Resource Center (ERC) at the University of Texas at Austin. This data set, recognized nationally for its depth and quality (Duncan, 2010), allows us to track teacher movements across all public schools in Texas, from 2004 to 2014, for all grade levels. Specifically, this data set provides us with teacher-level data for all years, including a teacher identifier, and all variables in teachers' employment and staff files (e.g., certification, pay, full-time status, gender, race, and subject and/or grade taught). The sample is comprised of 574,813 teachers from 9,853 public school campuses over 10 years.

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What We Discovered

This brief outlines five longitudinal measures of teacher turnover. These turnover measures capture different aspects of what we call instability in school staffing. We use the term 'instability' because it captures the organizational damage that ongoing turnover can inflict on schools. In presenting our measures, we identify schools with 'high' and 'low' rates of turnover on each measure, which we determined using both 'absolute' cutoffs (i.e. designating a school with 30% or greater turnover rates as a 'high turnover' school) as well as 'relative' cutoffs (i.e. designating a school in the top turnover rate quartile as a 'high turnover' school.) We use both these approaches with our five measures, described in Table 1.

Table 1: Summary: Short and Long-Term Measures of Teacher Turnover

Measure	Definition	Purpose
Short Term Measures of Turnover		
Annual Turnover	Measured by the proportion of staff in year (t-1) who left the school by year t	Identify the proportion of teachers who leave from the end of one school year to the beginning of the next school year*
Longitudinal Measures of Turnover		
Chronic Instability	"High" annual turnover, measured both by absolute and relative rates, for a certain number or percentage of years in a given band of years	Identify schools that perpetually struggle with high turnover
Cumulative Instability	Proportion of staff lost over time (e.g., 20% each year, totaling 60% of original staff in 3 years)	Identify the schools that lose the majority of their staff over time, and those that lose few staff over time.
Instability Entry and Exit	Low turnover one year, but move into high turnover status another year, or vice versa	Identify the schools that are more likely to fall into, or recover from, a period of high turnover
"Spell" of Instability	The number of consecutive years schools experience high turnover	Identify the average length of time that it takes for schools to stabilize once they experience high turnover
Episodes of Instability	"High turnover" status temporarily (e.g., two or more consecutive years of turnover) but return to stability	Identify schools that experience relatively short bouts of high turnover

Note: Although this is the aim of annual turnover measures, most administrative data sets only capture a snapshot of teachers' positions each year. Therefore, there may be within-year turnover (a teacher starts and leaves mid-year) that is not captured by such measures. Indeed, these types of occurrences (teachers hired late or quitting after a couple of weeks) are more likely to impact the most under-served schools.

Consistent with other studies, we find that annual turnover rates are higher for high- poverty schools and those serving large proportions of underserved minorities (see Figure 1). Further, the differences in the turnover rates we found are consistent with other studies (see, e.g., Clotfelter et al., 2007; Hanushek, Kain & Rivkin, 2004; Ingersoll, 2001). Also consistent with prior research we find that annual turnover rates are different based on school accountability ratings. The starkest difference in annual turnover rates was between schools with 'exemplary' accountability ratings (the highest accountability rating for schools in Texas) and schools with 'unacceptable' ratings (the lowest rating).

While these annual turnover rates, as with prior studies, illustrate concerning disparities between different types of schools, these short-term measures provide a relatively limited picture of turnover, in that they can mask the severity of

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attrition problems faced by schools over multiple years. As one example, a school might report a 20% annual turnover rate for three years, yet few studies would distinguish whether these losses were in the same positions (i.e., 20% of the same staff positions replaced each year over three years, with 80% of staff positions remaining stable), or different positions (i.e., the 20% is comprised of different staff positions replaced each year, accumulating to a 60% loss over three years, with just 40% of staff positions remaining stable). Thus, single-year measures of turnover can conceal deeper, underlying chronic staffing problems.

We find much sharper differences between high and low poverty schools for this measure as compared with annual turnover rates (see Figure 2), with high-poverty schools experiencing two to four times the rates of chronic instability (using both absolute and relative thresholds) as low-poverty schools. Similarly, high-minority schools experience higher rates of chronic instability than low-minority schools using both absolute and relative rates, though the differences are not as stark.

We also examined differences by geography (urban, suburban, and rural) and found that rural schools experienced the highest rates of chronic instability (see Figure 3). We find the sharpest differences in chronic instability rates between schools with the highest and lowest accountability ratings: while only 1.6% of schools with exemplary ratings experienced chronic turnover (using absolute rates), over 16.7% of schools with unacceptable ratings experienced chronic instability. The same results were found using relative rates, with over one-quarter of schools (28.3%) with unacceptable ratings experiencing chronic instability, compared to only 1.9% of schools with exemplary ratings. Our data

Figure 1

Annual Turnover Rate

suggest, therefore, that schools that are in greatest need of improvement are more often those experiencing chronic instability; it is possible that, with constant staffing churn, teachers in these schools are likely to have difficulty forming the types of relationships, trust, and shared vision needed for sustained improvement.
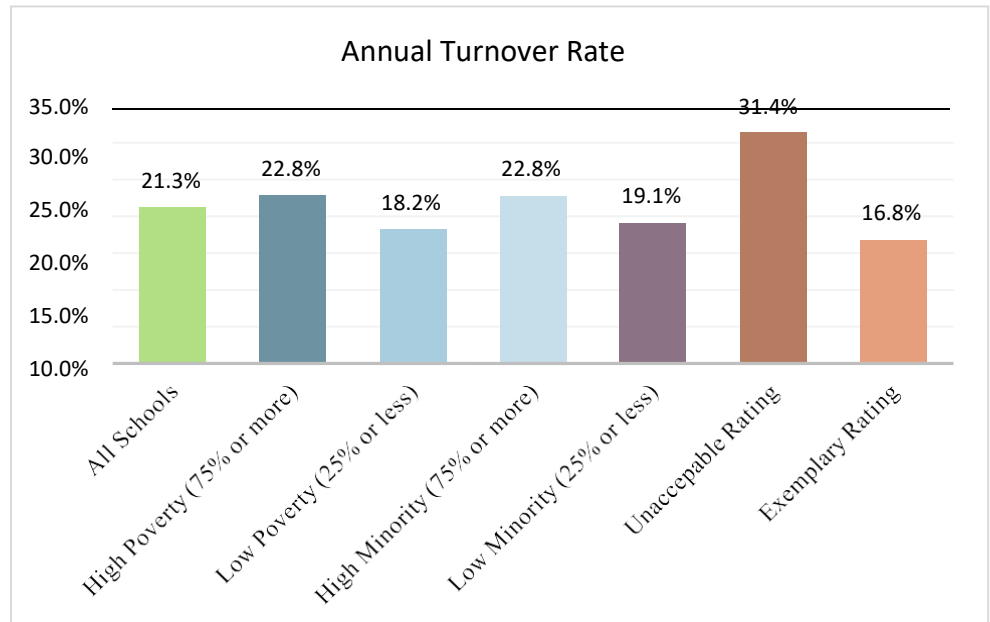

Figure 2

Chronic Instability Rate (7+ years)

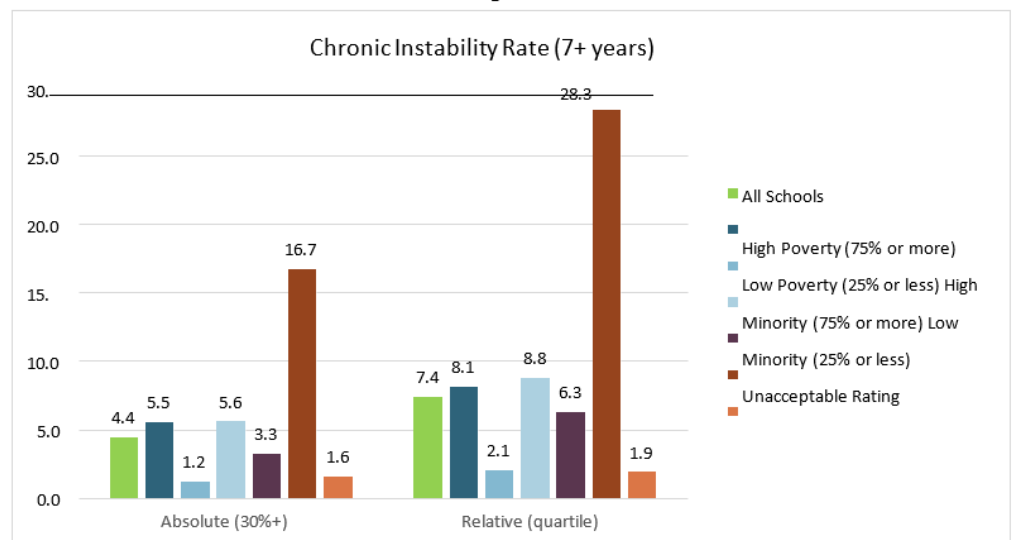TEXAS Education
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We define cumulative instability as the percentage of original teachers in Year 1 of our data who left their schools over time (e.g., after 2 years, 3 years, etc.). One of the most surprising findings when applying this measure to Texas data (which is the first analysis that we are aware of to apply this measure to data across an entire state) is that rates of cumulative instability, the total proportion of staff lost in schools over time, are high for many Texas schools. Remember that, as shown in Figure 1, average annual turnover rates for a single year are approximately 21% on average. Yet, in tracking cumulative turnover rates longitudinally, we found that, on average, schools lose 35% of their teachers over two years, more than half (59%) of their teachers over five years, and 72% of their teachers over eight years (see Figure 4).

Furthermore, we found remarkably similar rates of cumulative turnover across urban, suburban, and rural schools (see Figure 5). Therefore, major losses of human capital are accumulating across all schools in Texas over time, which is a concerning policy issue. We also find sizeable differences in cumulative instability between high and low poverty and high and low minority schools, with the starkest differences remaining between schools with the highest and lowest accountability ratings. This raises an important question about the extent to which low accountability ratings are a cause, or a result, of severe turnover problems. While low accountability ratings may drive teachers out of a school, constant churn can potentially make it more difficult for schools to engage in sustained improvement. At the very least, these cumulative rates suggest that these schools need intensive teacher retention supports.

We find that 12.6% of schools became 'high turnover' (or 'unstable') schools in any given two-year period when using the 30% absolute threshold (see Figure 6). There are differences, again, in instability 'entry' between high and low minority schools, and between high and low
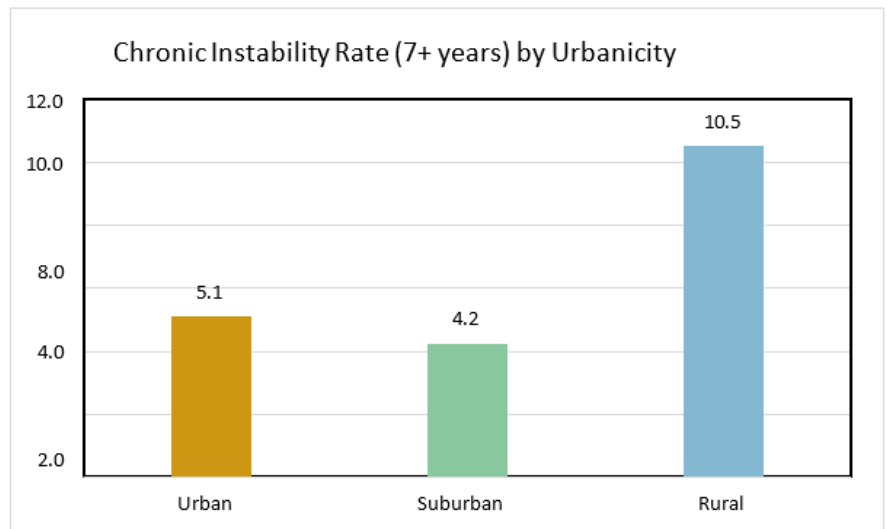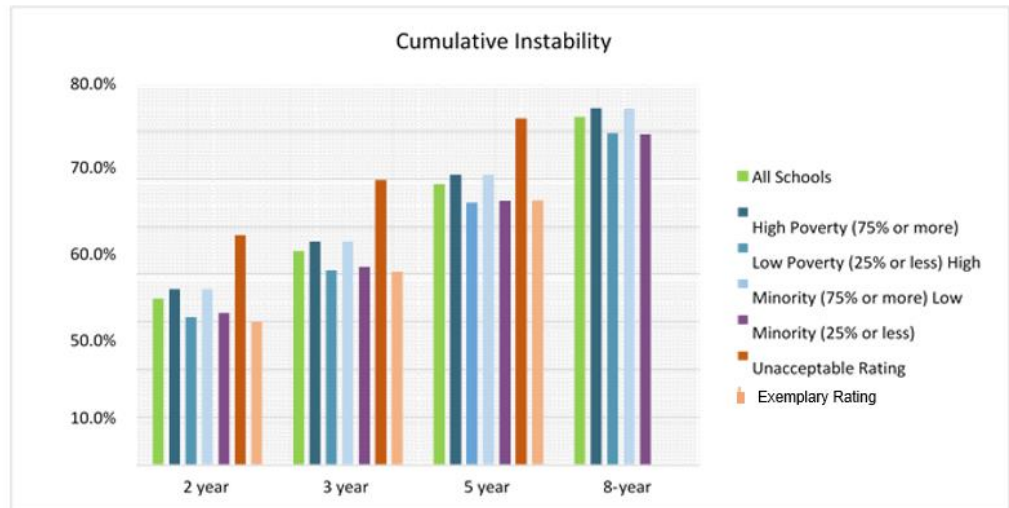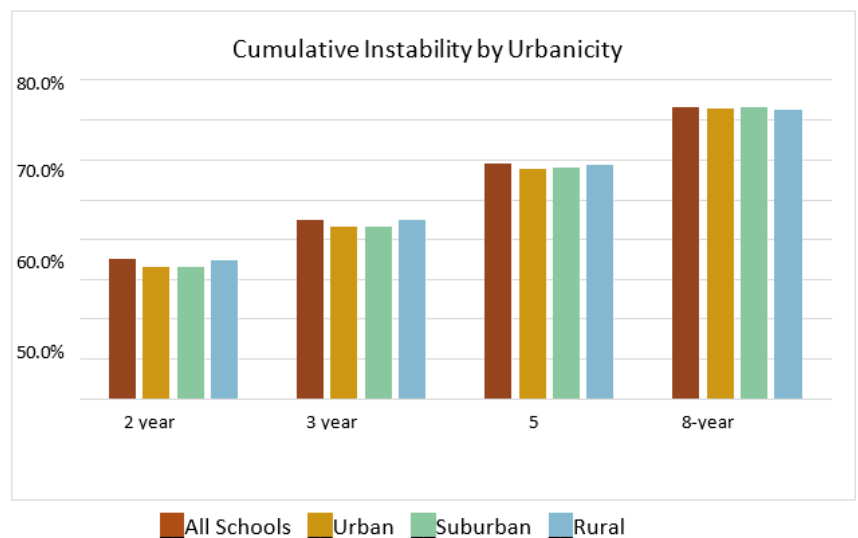
Figure 3

Chronic Instability Rate (7+ years) by Urbanicity

Figure 4

Cumulative Instability

Figure 5

Cumulative Instability by Urbanicity

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poverty schools. Furthermore, we find that very high poverty schools (90% or more poverty) twice as often become unstable if they were not unstable the year before, as compared with low-poverty schools (10% or lower poverty). Schools with unacceptable ratings entered high turnover status almost eight times more often than schools with 'exemplary' ratings. This suggests that there are subsets of schools (which are more likely to be high poverty, high minority, and low performing) that may not necessarily be in high turnover status in any given year, but are at greater risk of becoming high-turnover schools, and that new policies should be developed and directed at these campuses to help them avoid this outcome.

Figure 6

The instability 'exit' measure identifies which high-turnover schools are able to leave high-turnover status. This measure therefore captures the extent to which different types of schools with high rates of turnover in any given year are able to become more stable the following year. We find that, of schools that are unstable, just over half (54.8%) become relatively more stable (below the 30% 'high' turnover threshold) the next year (see Figure 7). However, there are lower rates of instability exit for high-minority and high-poverty

Figure 7

schools, which means that these schools have much more difficulty re-stabilizing their staff. We find that schools with unacceptable ratings have the lowest rates of instability exit, which suggests they have the hardest time exiting high-turnover status.

Turnover spells capture the length of time a school is a 'high turnover' school. We define a turnover spell as the number of consecutive years a school remains in 'high turnover' status. While instability entry and exit (above) capture the likelihood of schools 'falling into' high turnover status or 'leaving' high turnover status in any given year, the instability spell measure captures the length of time high-turnover schools experience high turnover before they are able to stabilize. Here we focus just on those schools that experienced at least one year of high turnover, excluding the 37.8% of schools that never experienced "high turnover."
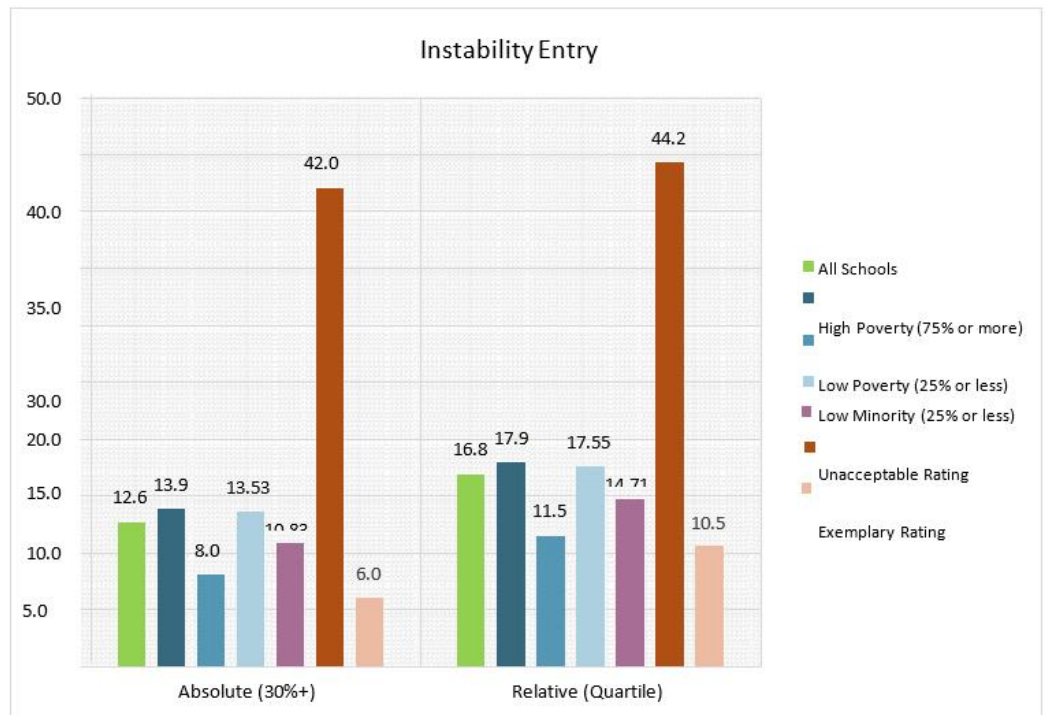
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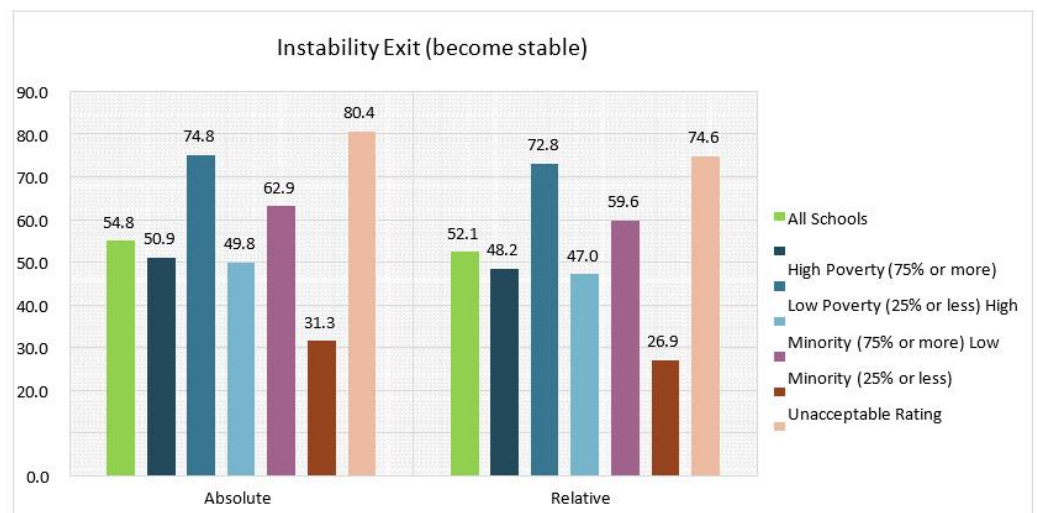College of Education

Figure 8

Percentage of Schools in Each Spell Length

For over half of Texas schools that experienced at least one year of high turnover, high turnover experienced in one year did not persist into a second year, regardless of whether an absolute or relative measure was used (see Figure 8). On average, schools that experience high turnover tend to be in that status just over two years using relative rates, and just under two years using absolute rates. Between 20% and 25% of schools that experienced high turnover had spells of three or more

years, depending on the measure. Although we do not display the results, high-poverty and high-minority schools experienced somewhat longer spells of instability, whereas low-poverty and low-minority schools experienced shorter spells. Schools with unacceptable ratings experienced longer spells of instability than schools with exemplary ratings.

We also found that some schools never exited high turnover status: Using relative rates of turnover, a very small percentage of our schools (0.65%, or 44 out of the 6,819 schools for which we had 10 years of data) had spell lengths of 10 years. These schools experienced high turnover for the full duration of the observation period, never exiting the spell. Using absolute rates, an even smaller percentage, 0.38% of schools, or 26 out of the 6,819 schools, never exited high turnover status. These patterns suggest that this small population of schools experiences unique staffing challenges, and is never able to decrease its high turnover rates.

Our last measure of turnover looks at 'episodes of instability,' which are defined as two consecutive years in high turnover status. This measure captures schools that not only fall into 'unstable' status, but remain stuck there for at least two consecutive years; and how frequently this happens over a long period of time (in this case, over a 10-year period). This measure therefore identifies schools that are constantly struggling with bouts of instability, with some periods of recovery, as opposed to simply capturing the spell length, which our previous measure does.

We found that the majority of schools (65% to 74%, depending on the measure) experienced no episodes of instability, i.e., did not have two consecutive years of high turnover (see Figure 9). Schools in this group may, therefore, have more 'healthy' turnover, where teachers that are ineffective or who disagree with school mission leave the school in a 'one time' staffing change.
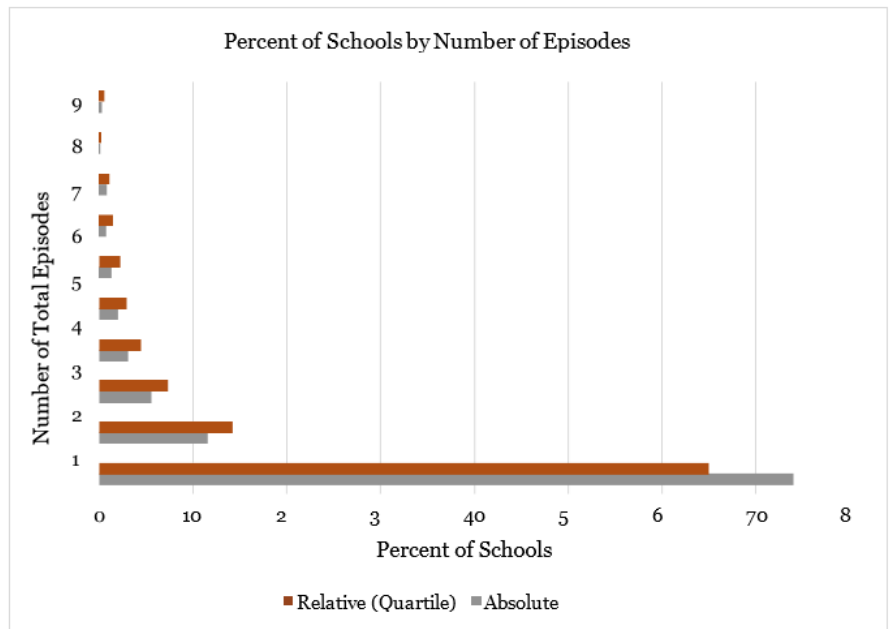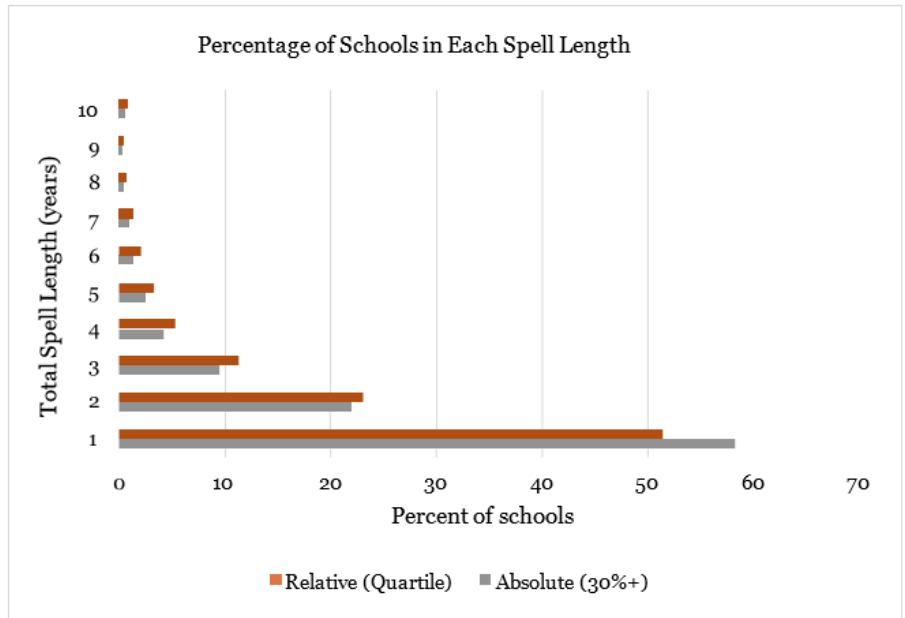
Multiple episodes of turnover, by contrast, may indicate more serious staffing problems. Schools with high episode counts are able to exit high turnover status briefly, but continue to re- enter it, thus 'destabilizing" frequently, a phenomenon that can potentially erode the social resources within the school. While the percentage of schools experiencing multiple episodes of instability is relatively small (about 14% to 20% depending on the measure), as with the other measures, we found that high-poverty and high-minority schools experienced more episodes than low-poverty or low-minority schools, on average. Similarly, the differences were starkest based on accountability ratings; schools with unacceptable ratings experienced more than two episodes, on average, based on relative rates, while schools with exemplary ratings experienced less than one. We also found that while 36.2% of schools with unacceptable ratings experienced 3 or more episodes of turnover in the 10-year period, only 5.72% of schools with exemplary ratings did so.

Policy Recommendations/Conclusions

The six measures of teacher turnover presented in this brief each shed light on a different part of the problem of staffing instability in schools. We have argued that while annual turnover rates, the measure most commonly used by researchers and policymakers, can be helpful in flagging schools that have experienced significant staffing churn, they do not provide information as to whether schools may be suffering from temporary (or even 'healthy') turnover, or whether they have struggled with 'deeper' turnover problems for years. Long-term measures, by contrast, help to illuminate nuances—and severity—of the turnover problems that may be facing schools over time. For example, schools may experience perpetually high rates of turnover (chronic); deep losses over time (cumulative); repeated bouts of turnover (episodic); or remain 'stuck' in high turnover status for a number of years (turnover spell), or a combination of these. While schools suffering from each of these types of problems could expect difficulties in building the social ties necessary for long-term relationships and for school-wide improvement (Holme & Rangel, 2012; Spillane, Kim & Frank, 2012), the policy interventions for a school experiencing chronic turnover year after year may be different than a school experiencing high cumulative turnover, where losses are relatively small each year, but amount to turnover of virtually the entire school's staff over a period of five years. Research is needed to identify what factors cause these different types of instability, and what interventions are most appropriate for each type of problem.

When our measures are illustrated with Texas state data, the longitudinal measures of turnover conceptualized and illustrated within this essay indicate both concerning losses of human capital across all schools over time, and particularly troubling disparities in turnover patterns for schools serving low-income students and students of color. Our data show that high- poverty, high-minority, and low-performing schools struggle with much deeper turnover problems than the annual turnover rates suggest. Such schools, our data indicate, are not only more likely to struggle with repeated high turnover rates (chronic), but struggle for longer periods of time with 'deep' turnover, losing more staff (cumulative), more often (episodic) than schools serving few students of color or in poverty. Our measures also show that those same types of schools are more vulnerable to becoming a 'high turnover' school (turnover entry), and have difficulty recovering from high turnover status (turnover 'exit'). We find that such schools are also likely to suffer from multiple types of instability problems at the same time.

These findings have significant implications for policy and practice. Identifying which schools experience different types of instability may generate more targeted policy solutions. Indeed, using our measures, policymakers could more easily target scarce funds to the relatively small number of schools experiencing the greatest instability over time. It is particularly important to distinguish between those schools experiencing temporary spells of instability and those that experience chronic instability, as these situations require distinct policy remedies. In light of nationwide teacher shortages (Rich, 2015), policymakers may increasingly focus on teacher retention alongside teacher preparation and recruitment efforts, and our measures may suggest new insights to inform or focus those policy efforts.

Given the association between deep turnover and racial and economic concentration in schools, our findings also indicate that long- term struggles with turnover may be one of the underlying mechanisms through which racial segregation and poverty concentration negatively affect student performance in schools (see Reardon & Owens, 2014). Taken together, the multiple types of staffing and mobility measures can provide additional insights into the problem of turnover, and enhance our understanding of the causes and consequences of instability in schools. These measures can also potentially point to new directions in state and district policy to address instability, particularly for the most affected schools.

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