Grade-specific experience, grade reassignments, and teacher turnover

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ABSTRACT

This study documents that teacher turnover is strongly related to the pattern of grades that a teacher is asked to teach. Elementary teachers in North Carolina that teach the same grade in their first two years are approximately 20% more likely to stay than teachers who teach two different grades in their first two years of teaching. More generally, within total experience categories, teachers with the fewest years of grade-specific experience have the highest probability of turnover. We argue that this pattern is driven both by the disruption caused by grade reassignment and by the fact that teachers with stable grade assignments have effectively smaller workloads since they can reuse lesson plans and, more generally, apply grade-specific skills.

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1. Introduction

Teacher turnover poses a major challenge for school administrators. Given the substantial evidence that teachers improve dramatically in their first several years of teaching, early turnover leaves schools with a perpetually inexperienced and less effective staff (Clotfelter, Ladd, & Vigdor, 2006; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004). In addition to lowering average teacher quality, teacher turnover imposes administrative costs, estimated at nearly $5000 per exit by the Texas Center for Educational Research (2000).[1] Though the total consequences of turnover depend on the difference in quality between lost teachers and replacement teachers, understanding the dynamics of turnover is important for school management decisions. Even outside of the policy implications for schools, studying teacher

turnover is important to gain a more comprehensive understanding of the teacher labor market and labor supply decisions.

Given the costliness of turnover, a large body of research exists investigating both how pecuniary factors and working conditions impact turnover (Bradley, Green, & Leeves, 2006; Falch & Strøm, 2005; Feng, 2010; Hanushek, Kain, & Rivkin, 2004; Imazeki, 2005; Ingersoll, 2001; Jackson, 2009; Loeb, Darling-Hammond, & Luczak, 2005; Mont & Rees, 1996). While pecuniary factors are straightforward to measure, working conditions are more difficult to measure precisely. In the absence of direct data on working conditions, researchers have studied class size and student characteristics as proxies for workload and found both to be predictive of turnover.

In this paper, we examine a new proxy for workload among elementary school teachers and show that it strongly predicts teacher turnover. By using the longitudinal structure of our data, we are able to determine whether a teacher is teaching a grade for the first time or whether she has previously taught the grade. Just as teaching a larger class may be more difficult than teaching a smaller class, we suggest

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[1] These administrative costs are given in year 2000 dollars.

that teaching a new course is more difficult than teaching a course previously taught.[2]

We find that grade-specific experience and grade reassignments are predictive of teacher turnover. Comparing teachers with the same amount of total experience, those with less grade-specific experience are found to be more likely to leave. For example, a second-year teacher assigned to a new grade is almost as likely to leave the school as a novice teacher. Similarly, a fifth-year teacher teaching their grade for the second time is more likely to leave than a third-year teacher teaching their grade for the third time. This same general pattern holds until six years of experience, after which the pattern becomes less clear.

While the descriptive analysis we provide is suggestive, it is important to know whether these patterns are driven by causal forces or simply reflect other correlated factors. Without clear exogenous variation in grade reassignment, it is difficult to differentiate between these two possibilities with certainty, but we aim to provide as much evidence as possible on whether these patterns can be explained by other factors. To address school-level unobservables, all of our specifications include school fixed effects, but even with the school fixed effect, two distinct forms of bias may exist. First, it is possible that schools change over time in a way that both increases teacher turnover and increases grade switches. The school fixed effect does not address these unobservable time-varying factors. Second, within a school, it may be that the teachers who are switched are a select group who are more likely to leave for other reasons.

While we are unable to address these two forms of bias simultaneously, we address each issue individually by extending the baseline school fixed effect specification in two ways. In the first extension, we control for time-varying unobservables by including a school-by-year fixed effect, which focuses the analysis entirely within school years. In the second extension, we aggregate the analysis to the school-by-year level to address the fact that the teachers who switch grades may be different from those who do not switch. This specification controls for school fixed effects so that we compare turnover rates across years within a school. Importantly, we are unable to estimate both extensions simultaneously because the aggregate specification has no variation within a school-year.

Although each extension uses a very different source of variation, both produce qualitatively similar results. We take the consistency between approaches as evidence that the pattern is not merely driven by selection or time-varying shocks, though there may exist coincidental biases operating in the same direction that lead both approaches to similar results. For example, in the specification aggregated to the school-by-year level it is possible that estimates are biased up if a new principal both increases grade reassignments and separately contributes to turnover directly. We control for factors such as principal regime change, but we cannot address the possibility that unobserved school-year shocks influence both grade reassignment and attrition. In our within school-year extension, we address concerns regarding school-year

shocks, but in that specification, it is possible that estimates are biased up if teachers that change grade assignments have unobservable characteristics that make them more likely to leave. We show that observed characteristics do not explain the relationship between grade reassignment and turnover, but unobservable differences may bias our estimates upward. Ultimately, we view our evidence as being supportive of a causal story, but not definitive.

This paper has implications in the spirit of Jacob and Rockoff (2011) who emphasize that not all school reforms need to be large scale, costly, and controversial. One area in which principals often have complete autonomy is over teacher classroom and grade assignments. The magnitudes we find are large relative to those found for class size reductions or salary increases, which suggests that teaching assignments may be a viable avenue for reform. Reducing grade reassignment, particularly for inexperienced teachers, may reduce attrition with relatively little financial cost or political controversy. That said, our analysis is unable to rule out all sources of potential bias and we provide no evidence regarding the benefits of grade reassignment. As such, we view our research as providing one piece of evidence on the impact of grade reassignment, but future work is needed to determine whether on net reducing grade reassignment benefits schools.

2. Data

The data for this paper come from the North Carolina Education Research Data Center, which is a rich longitudinal administrative database. The North Carolina data we use follow every public school teacher in the state of North Carolina from 1995 to 2007 and include a large amount of teacher information for every year that they teach in North Carolina. Teacher information includes demographic information, standardized Praxis test scores, college attended, and highest degree earned as well as grade assignments, salary, and absences.

The key dependent variable is teacher turnover from the school. Our measure of turnover captures both voluntary and involuntary separations. In most districts, involuntary separations are determined jointly between the principal of the school and the local educational agency (school district). The NC state board of education reports that less than 10% of turnover is initiated by school districts, though it is possible that some turnover reported as voluntary is the result of pressure from the administration (NCDPI, 2014). While we focus on turnover from the school, the patterns we find are similar when turnover is measured from the district or state. The key independent variables are total past experience and grade-specific experience. We obtain experience information from teacher pay files and this should reflect total teacher experience regardless of when and where it was accrued. To calculate grade-specific experience, we count the number of years in which a teacher has previously taught their current grade.

While total past experience is measured for all teachers, grade-specific experience can only be measured for teachers who start teaching after the data begin because we have no information for grades taught prior to 1995. As such, we restrict our analyses to teachers who begin teaching after 1995. Focusing on teachers who begin after 1995 means we are

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[2] We focus on elementary teachers where course assignment and grade assignment are generally equivalent so throughout the text, we use the terms grade and course interchangeably.