

## **Blinded Abstract Body**

*Limit 5 pages not including the Appendices (single-spaced, Times New Roman, 12 pt. font, 1 inch margins)*

### **Did the COVID-19 Pandemic Exacerbate Staffing Challenges in Turnaround Schools? Evidence from Michigan**

#### **Purpose**

In this paper, we examine teacher turnover before and during the pandemic in schools served through the Partnership Model of School and District Turnaround, a statewide intervention to turn around Michigan's lowest performing schools. Because Michigan began serving two cohorts of Partnership schools before the pandemic hit, we are able to disentangle the turnaround intervention's effects from that of the pandemic and examine any mitigating effect of the supports for turnaround schools relative to other low-performing schools. Then, drawing on educator survey data collected both before and during the pandemic, we unpack the mechanisms that may have contributed to changes in teacher mobility. Specifically, we ask:

1. To what extent did the Partnership Model impact the probability that a teacher will leave the school, district, and Michigan public education entirely, and how did this change during the pandemic?
2. How did teachers in Partnership schools experience pandemic schooling, and what factors may have mitigated the pandemic's effects on teacher mobility in Partnership schools?

#### **Background and Context**

Just as the pandemic wrought havoc on the overall workforce across the United States (Albanesi & Kim, 2021; Landivar et al., 2020), COVID-19 also shifted labor market patterns in K-12 education. There is growing evidence of large numbers of staff vacancies and mounting staffing challenges nationwide (Bleiberg & Kraft, 2022; Goldhaber & Theobald, 2022; Nguyen et al., 2022). While the initially feared exodus did not immediately materialize in 2021, recent evidence points to increased teacher exits and extreme levels of burnout during and after the 2021-22 school year. The pandemic's effects on the teacher workforce are likely to have varied by school context, just as its health and economic consequences varied. In particular, it is likely the lowest performing schools—which tend to be located in lower-income and urban areas with high proportions of students of color—have been the most impacted. This is particularly problematic considering that low-performing schools throughout the country have historically grappled with high rates of teacher turnover and confronted challenges filling open positions with highly effective teachers even prior to the pandemic (Clotfelter et al., 2007; Fuchsman et al., 2022; Guin, 2004; Ingersoll, 2001).

Under the federal Every Student Succeeds Act, as with federal accountability initiatives before it, the lowest performing schools and districts are targeted for turnaround interventions intended to improve student outcomes quickly. These turnaround initiatives rely heavily on a stable, highly effective teacher workforce to impel and sustain improvement efforts (Henry et al., 2020; Malen & Rice, 2016; Strunk et al., 2016). Difficulties maintaining a stable and effective

workforce can undermine school turnaround processes. To the extent that the COVID-19 pandemic induced greater teacher turnover, prior research on teacher labor markets suggests that these challenges may be amplified in low-performing turnaround schools, which serve large shares of the nation's Black, Hispanic, and economically disadvantaged students and communities. Such challenges are especially concerning because low-performing schools throughout the country were tasked with closing opportunity gaps prior to the pandemic, and are now continuing those efforts following more than a year of pandemic schooling that exacerbated opportunity gaps between traditionally disadvantaged students and their more advantaged peers (Engzell et al., 2020; Kilbride et al., 2021; Kogan & Lavertu, 2021; Kuhfeld et al., 2022). However, because the very lowest performing schools were receiving turnaround supports prior to the pandemic and because these supports often prioritize human capital, it is possible that these supports helped to assuage the pandemic's negative effects on teacher mobility.

## **Method**

### *Data & Sample*

To examine the extent to which the Partnership Model and the pandemic appeared to affect teacher turnover, we draw from eight years of statewide administrative data from 2014-15 through 2021-22 provided by MDE and the Center for Educational Performance and Information (CEPI). Using these data, we can measure turnover that occurred up through the 2020-21 school year—the second year in which teacher turnover was affected by the pandemic, as administrative data on teacher placements from fall 2022 are necessary to measure turnover coming out of the 2021-22 school year. We have just received administrative data from 2022-23 and will incorporate teacher fall 2022 placements, and therefore teacher turnover measures from 2021-22, into the next iteration of this paper in order to measure turnover through the third pandemic-impacted school year.

The analytic sample includes teachers in Partnership schools and a set of similarly low-performing near-selected schools that were not identified for Partnership in any of the three identification rounds. MDE identified schools for Partnership in Round 1 if they were in the bottom 5% of schools on Michigan's school performance index in all three of the 2013-14, 2014-15, and 2015-16 school years. Round 2 schools were in the bottom 5% of the school performance index in 2015-16 *and* had continued low performance in 2016-17. Schools were identified for Round 3 if they were in the bottom 5% in 2016-17.

We generate our comparison group of near-selected schools as those that were low performing in the same timeframe as Partnership schools were selected, but were not targeted for intervention. We include in the near-selected comparison group those schools that were: (1) in the bottom 5% on the state index system in 2015-16 but not selected for Partnership, and (2) in the 6th to 10th percentile on the state's ESSA index in 2016-17. In total, the analytic sample includes 120 Partnership schools across 37 districts and 204 comparison schools in 133 districts, constituting 44,681 teacher-year observations representing about 14,000 unique teachers in 324 unique schools. We run additional analyses in which we drop from the comparison group 57 non-Partnership schools in Partnership districts.

We examine four dichotomous nested measures of teacher turnover: (1) leaving the school regardless of pathway out, (2) leaving the district, (3) leaving teaching in Michigan public

schools, and (4) leaving the Michigan public education system entirely. We construct each of these measures for school year  $t$  based on where the teacher is observed in fall of school year  $t+1$ .

We include baseline covariates representing school-level characteristics of the student body, including the proportion of students by race/ethnicity, economic disadvantage, English learner status, special education status, and school enrollment. We also include covariates for teacher race/ethnicity (Black, Hispanic or Latino/a/x, other race, with White as the reference category) and gender (male, with female as the reference category).

To answer our second research question on the mechanisms that might contribute to the effects of Partnership, we draw on data from teacher and principal surveys administered in Partnership schools for two pre-pandemic years (fall 2018 and fall 2019) and two pandemic years (spring 2021 and spring 2022). **Error! Reference source not found.** provides response rates for teachers and principals, respectively, by year and cohort. The teacher response rate was similar across cohorts and ranged from a low of 32% in 2021-22 to a high of 57% in 2019-20. The principal response rate was similar across cohorts in all but the first year and ranged from 28% in 2018-19 to 66% in 2020-21.

### *Empirical Strategy*

To examine the effects of Partnership on teacher mobility before and during the pandemic, we estimate event study models examining the extent to which the probability of turnover deviates from pre-identification trends for Partnership schools relative to our set of near-selected comparison schools. To do so, we pool data from the two cohorts and the comparison group and create a series of year indicators centered at the identification year for each cohort and then estimate event study models with school and year fixed effects. A growing research base shows that these two-way fixed effects models can lead to biased estimates when there are heterogeneous effects across implementation cohorts (Athey & Imbens, 2022; Baker et al., 2022; Callaway & Sant'Anna, 2021; de Chaisemartin & D'Haultfœuille, 2020; Goodman-Bacon, 2021; Sun & Abraham, 2021; Wooldridge, 2021). Because there is evidence from prior research of heterogeneous effects by cohort (Burns et al., 2022), and because there is reason to expect differential effects before and during the COVID-19 pandemic (which initially affects the two cohorts in different implementation years), we estimate two-way Mundlak regressions (Wooldridge, 2021) allowing for separate effects in each of the cohorts in each of the pre- and post-COVID years. These models take the form

$$\begin{aligned} & Turnover_{ijct} && (1) \\ & = \sum_{k=-3}^4 \sum_{c=1}^2 \tau_k 1(t = t_s^* + k) \times PartnershipCohort_c + \rho(\mathbf{X}'_{jt=2016} \times Year_t) \\ & + \gamma \mathbf{Z}'_i + \alpha_j + \theta_t + \varepsilon_{ijct} \end{aligned}$$

where  $Turnover_{ijct}$  is a dichotomous variable representing one of the four turnover outcomes for teacher  $t$  in school  $j$  in implementation cohort  $c$  in school year  $t$ . The term  $1(t = t_s^* + k)$  represents a set of indicators for the years pre- and post-Partnership implementation, with  $t_s^*$  denoting the year in which school  $s$  adopted Partnership spanning from three years prior to Partnership identification through four years of implementation.  $PartnershipCohort_c$  takes a

value of 1 for schools that were included as part of each of the two implementation cohorts, and zero otherwise.  $X$  is a vector of school-level covariates measured in 2016 (Cohort 1's identification year) as described above, interacted with a linear time trend, denoted as  $Year_t$ .  $Z$  is a vector of teacher covariates described above. Each model includes school fixed effects ( $\alpha_j$ ), year fixed effects ( $\theta_t$ ), and an idiosyncratic error term ( $\varepsilon$ ) clustered at the school level.

The coefficients of interest are those represented by  $\tau_k$ , which provide the estimated effect of Partnership for Cohort  $c$  in the  $k^{\text{th}}$  year of implementation. We measure the effects relative to the year of Partnership identification ( $k=0$ ), so  $\tau_{-3}$  through  $\tau_{-1}$  are the difference between Partnership and comparison schools in the years prior to Partnership and  $\tau_1$  through  $\tau_4$  are the estimated effects in the years of Partnership implementation.

The  $\tau_k$  estimates are relative to remaining in the school for the school turnover model, remaining in the district for the district turnover model, and remaining in the Michigan public education system in any capacity for the model predicting leaving the profession. The model predicting leaving teaching includes a control for being promoted so that the  $\tau_k$  estimates are relative to remaining in the Michigan public school workforce as a teacher or school leader. Because these are linear probability models, the estimates can be interpreted as the difference in the probability of turnover for teachers in Partnership schools in a given cohort relative to teachers in comparison schools in relative year  $k$ .

Intuitively, our approach involves controlling for separate pretreatment trends for each implementation cohort and then estimating the deviation from those trends in the treatment years. The Mundlak model provides a flexible approach to estimating separate treatment effects for each cohort and implementation year. There are two core identifying assumptions for this model to provide causal effects. First, the pre-identification trends for the full treated (i.e., Cohorts 1 and 2 together) and comparison groups should be parallel, conditional on covariates (Olden & Møen, 2022; Wooldridge, 2021). Second, there should be no evidence of an anticipatory effect of Partnership in the year prior to identification, again conditional on covariates. We examine the parallel trends assumption by testing whether the pre-identification coefficients ( $\tau_{-3}$  through  $\tau_{-1}$  for the two cohorts) are jointly significantly different from zero. We test the no anticipation assumption through an examination of the  $\tau_{-1}$  coefficients.

## Findings or Results

We find that in the intervention years prior to the pandemic, there were no consistent effects of the turnaround model on turnover from the school, district, or profession—though we find descriptive evidence that turnover from the district was increasing in Cohort 1 and decreasing in Cohort 2. Figure 1 provides event study estimates for leaving the school and leaving the district.

During the pandemic, we find a significant decrease in the probability of leaving both the school and district among Cohort 1 teachers. Specifically, among Cohort 1 teachers, we find a 5.3 percentage point decrease in the probability of leaving the school in the first pandemic year and a 9.1 percentage point decrease in the second. An  $F$ -test confirms that this second estimate represents a significant decrease over the last pre-pandemic treatment year for Cohort 1 ( $p=0.047$ ). The pandemic-era decrease in the probability of leaving the district for Cohort 1 teachers was even more pronounced, with statistically significant estimates of -0.08 and -0.12 in each of the treated pandemic years, respectively. Again, an  $F$ -test finds that the second estimate is a significant

decrease over the already sizeable and significant last pre-pandemic treatment year ( $p=0.019$ ). This points to a stronger effect of Partnership during the pandemic.

Among Cohort 2 teachers, we find no effect on leaving the school and a marginally significant *increase* in probability of leaving the district in the first pandemic year (the cohort's second treated year), followed by decreases in leaving both the school and district in the second pandemic year. The second pandemic year decreases are both significantly smaller than the pre-pandemic treated year estimates, suggesting a stronger effect of Partnership during the pandemic.

There is little evidence to suggest that teachers in Partnership schools were more or less likely to leave teaching or exit the Michigan teacher workforce than their colleagues in comparison schools (Figure 2). However, we do find small, marginally significant increases in the probability of leaving teaching among Cohort 2 teachers in the pre-pandemic intervention year and among Cohort 1 teachers in the first pandemic year.

Drawing on survey data, we find that teachers reporting plans to stay in their schools often report that their students are a factor in that decision—and Cohort 1 teachers perceived that their students faced especially salient challenges during the pandemic (Figure 3). In particular, Cohort 1 teachers perceived that their students were grappling with major challenges related to attendance, lost socialization opportunities, parent or guardian job loss, and new childcare responsibilities. While Cohort 2 teachers also perceived substantial student challenges, Cohort 1 teachers reported significantly greater challenges across almost all question items (Figure 4). It may be the case that Cohort 1 teachers stayed in their schools to support their students through the pandemic. We also find that Cohort 1 teachers perceived that their principals were more effective than did their counterparts in Cohort 2 (Figure 5), suggesting school leadership may have played a role in teacher decisions to remain.

### **Conclusions and Implications**

These findings show that before the pandemic struck, teacher mobility was declining in Cohort 1 but not Cohort 2 schools. We offer two possible reasons for Cohort 1's declining teacher turnover. First, it may be the case that Partnership identification itself allayed Cohort 1 teacher concerns about school closures, prompting more teachers to stay in their positions. Second, Cohort 1 teachers reported positive perceptions of their school leaders and that their school leaders were especially effective at communicating the central mission of the school. Principals may have garnered buy-in to their school improvement efforts, driving teachers to remain in the school or district to contribute to turnaround.

When the pandemic struck, teacher mobility decreased in Partnership relative to comparison schools—immediately in Cohort 1 schools and in the second year in Cohort 2 schools.

These results suggest that the Partnership model—both before and during the pandemic—may have helped to buffer treated schools from the substantial challenges caused by teacher turnover. This is important given the key role that a stable and effective teacher workforce plays in successful turnaround reforms (Author, 2022; Henry et al., 2020), and is particularly welcome given the substantial challenges Partnership schools face with teacher mobility.

## Appendix A - References

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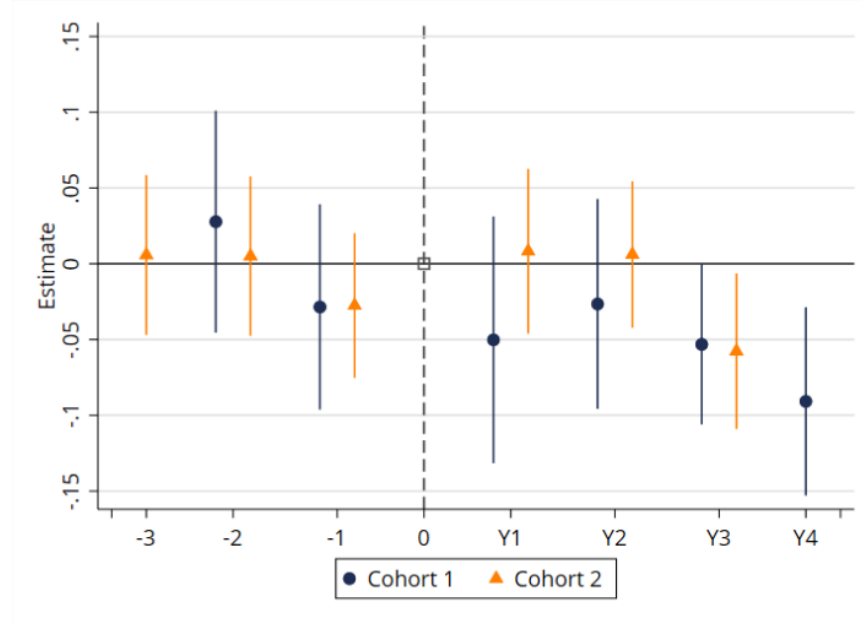
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## Appendix B - Tables and Figures

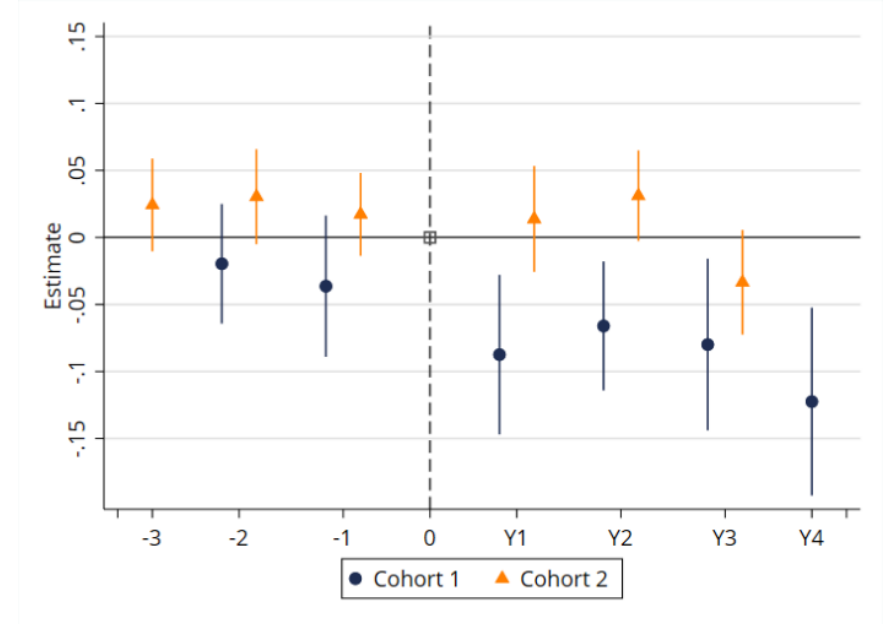
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**Figure 1. Event Study Plots, Leaving the School and District**

Panel A. Leaving the school



Panel B. Leaving the district

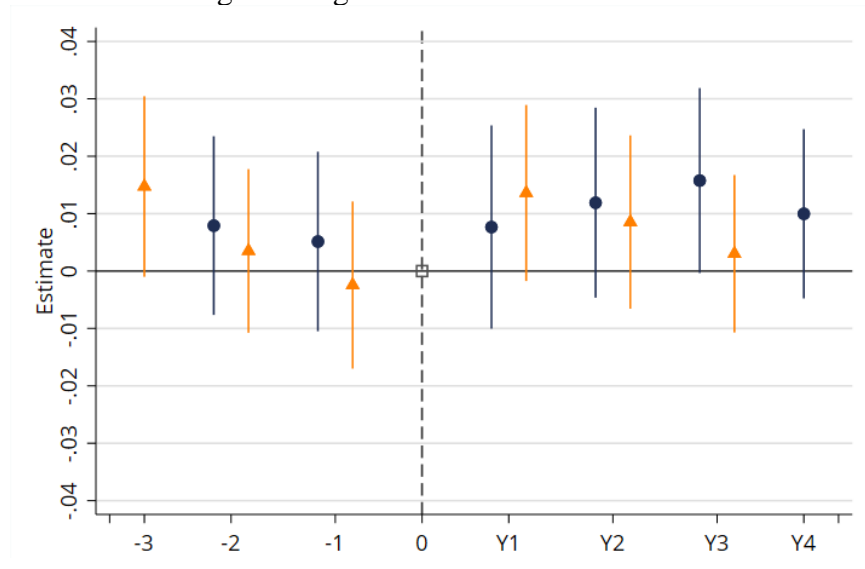


NOTE: Plots provide coefficient estimates from two-way fixed effect Mundlak event study models predicting leaving the school (Panel A) and leaving the district (Panel B). Markers represent coefficient estimates on Cohort x Relative Year indicators ( $\tau_k$ ) and spikes denote 95% confidence intervals.

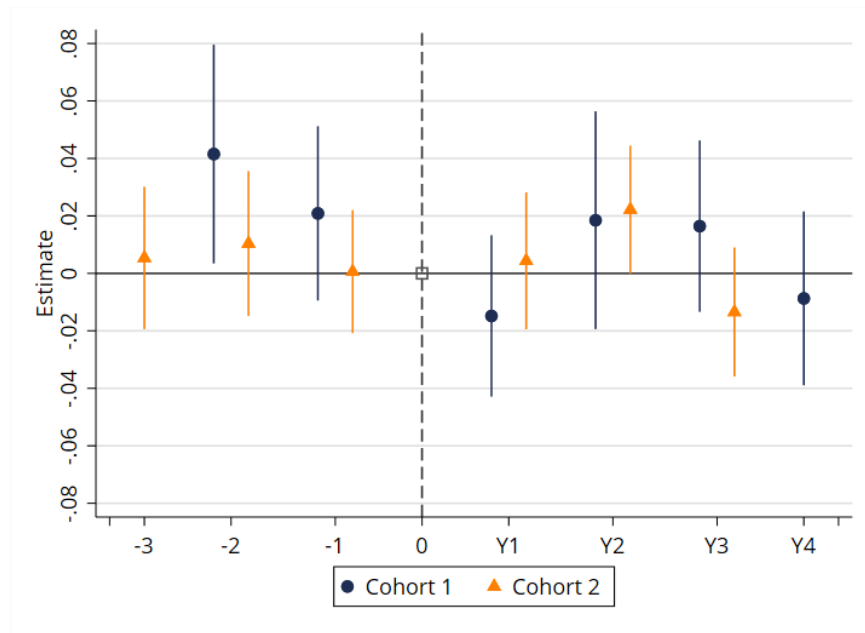


**Figure 2. Event Study Plots, Leaving Teaching and the Michigan Public Education System**

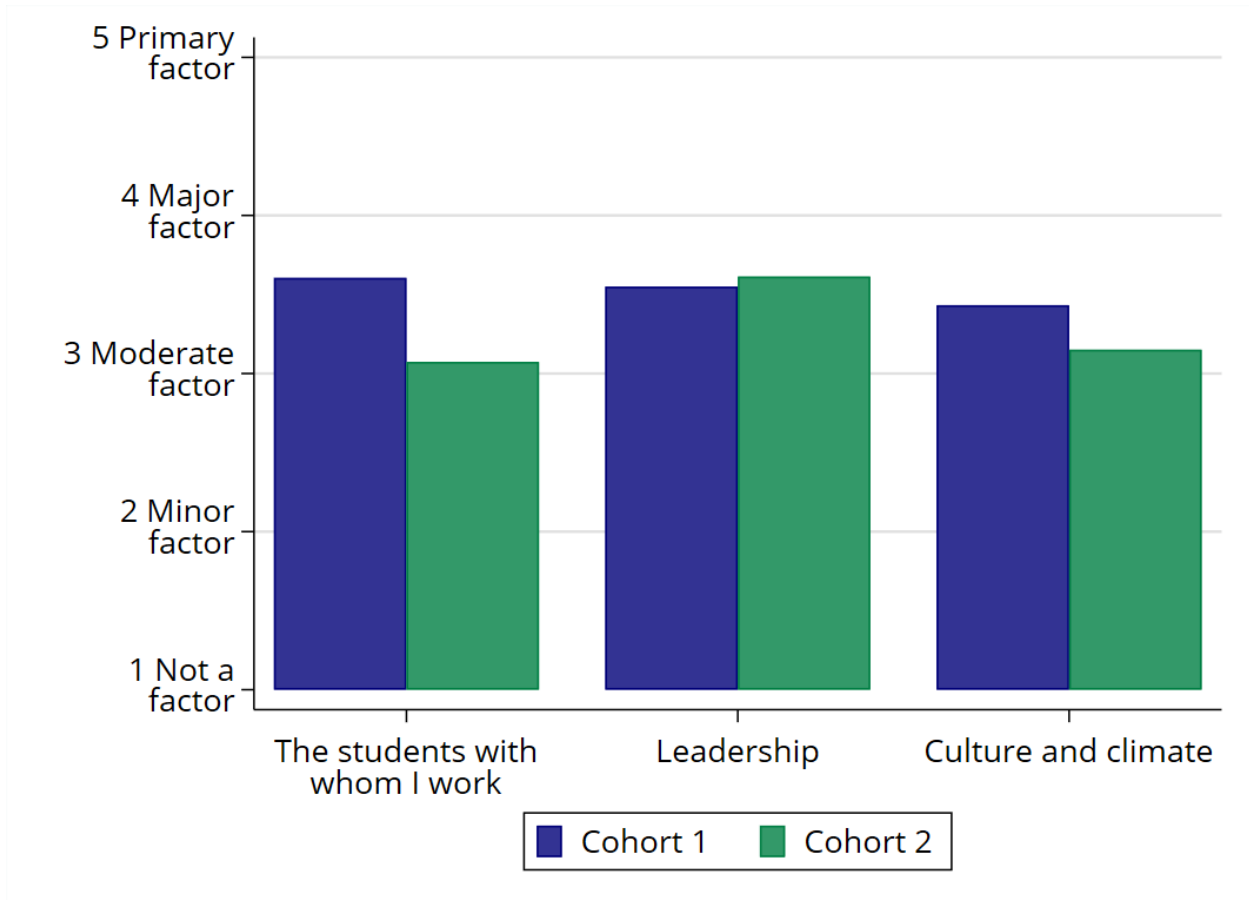
Panel A. Leaving teaching



Panel B. Leaving the Michigan public education system

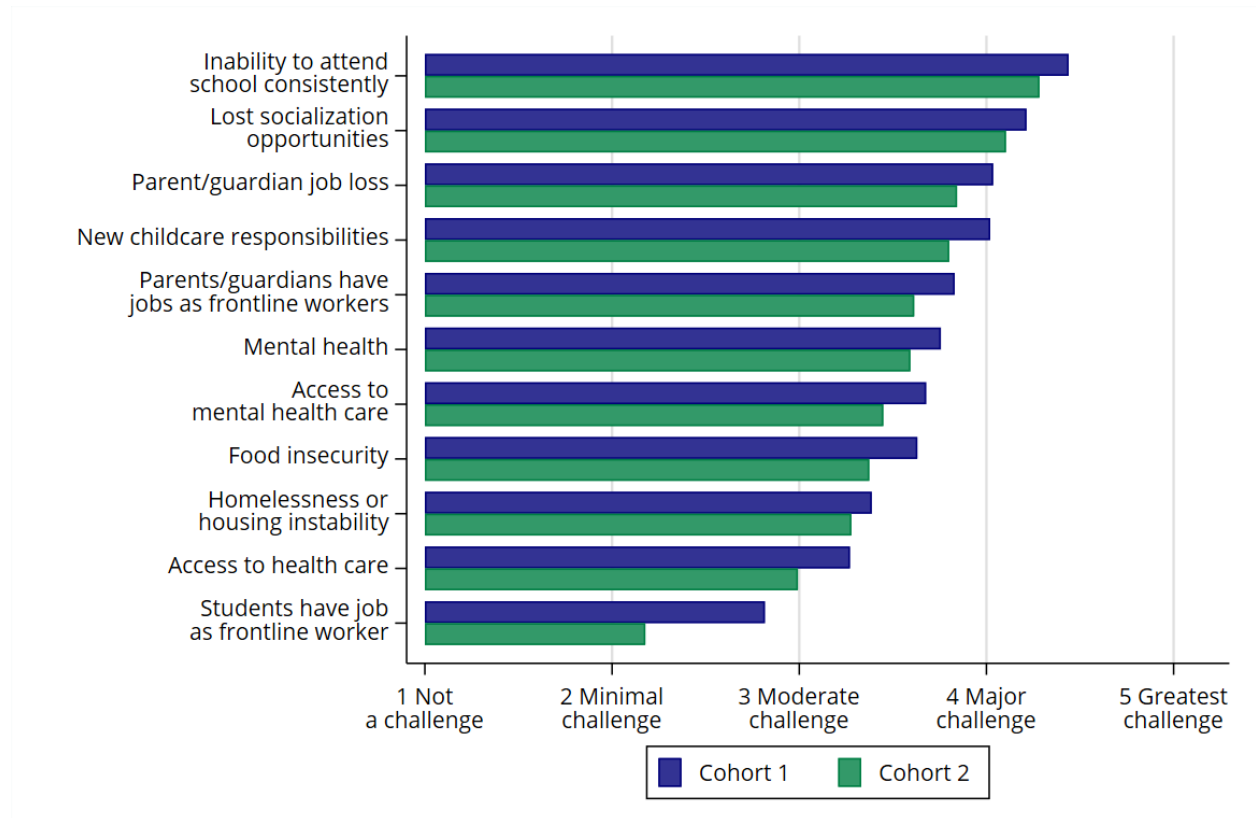


**Figure 3. Teacher-Reported Reasons for Plans to Stay in Same School, by Cohort, 2020-21 School Year**



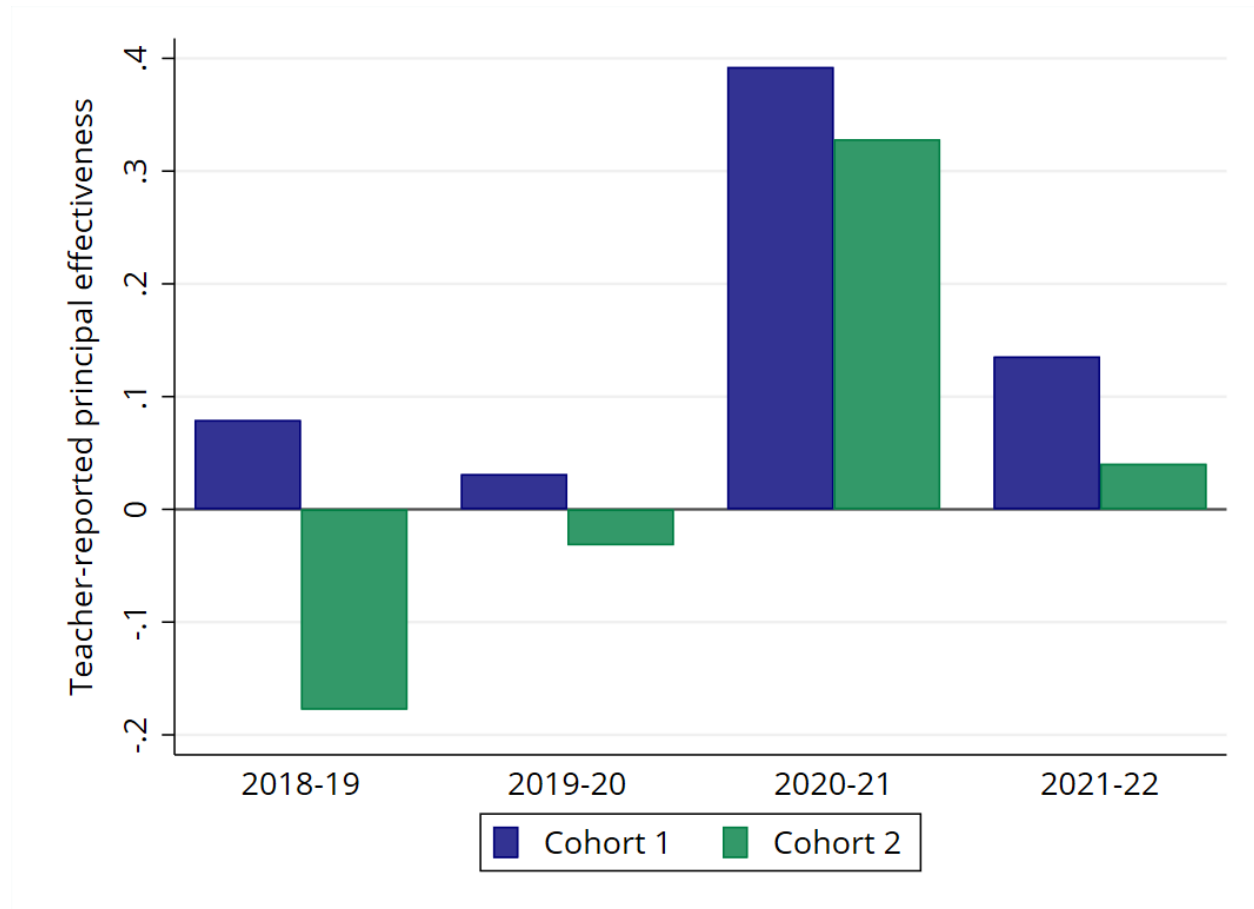
Note: Bar heights provide weighted means of teacher responses to three items under the question, “To what extent does each of the following factor into your plans to stay in your school?”, where “stay in your school” is piped in from question asking about plans for following school year. While the question listed several other factors, these are the top three responses for teachers reported plans to stay. A design-based F-test finds that the difference between the two cohorts’ distributions on “the students with whom I work” is marginally significant,  $F(3.97, 3360.44) = 2.05$  ( $p=0.08$ ). The cohorts are not significantly different on the other two items.

**Figure 4. Teacher Perceptions of Student Challenges, 2020-21 School Year**



Note: Bar lengths provide mean teacher responses to items related to student challenges during the pandemic in 2020-21. *N*s vary by item because teachers had the option to select “Don’t know”, ranging from 558 on access to health care to 966 on inability to attend school consistently. Differences statistically significant on all items other than homelessness or housing instability and lost socialization opportunities.

**Figure 5. Teacher Perceptions of Principal Effectiveness by Cohort**



Note: Bar heights provide cohort-by-year means of school leader effectiveness factor. Values above zero indicate that the group reported that their school leaders were more effective, on average, than the average respondent across all four study years. Values below zero indicate that the group reported that their leaders were less effective.