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Informing Education Policy with Rigorous, Empirical Research

March 2, 2026

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Thank You!

Disclaimer: This research is supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305C240007 to the American Institutes for Research. The opinions expressed today are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

Why I'm Here—Teacher Recruitment and Retention Matters

- Teachers are essential to student success—research and intuition confirm this
- There's heightened concern about the health of the profession—declining interest, prestige
- School districts often manage teachers in ways that ignore the complexities of the labor market
- The problems aren't evenly distributed—high-need schools and hard-to-staff positions/subjects suffer the most

CALDER R&R
Studying Policy Levers to Improve Recruitment & Retention

IES-funded research and development center to study recruitment and retention across the teacher pipeline:

Early Interest →	Preparation →	Entry →	Retention
• Grown Your Own programs • Career Pathways	• Alternative pathways for paraprofessionals • Scholarships and financial incentives for teacher training • Labor market information	• Licensure requirements and barriers • Compensation: salary floors & targeted incentives	• Compensation: salary floors & targeted incentives • Working conditions (CBAs, 4DSW) • Job design (advanced teaching roles)

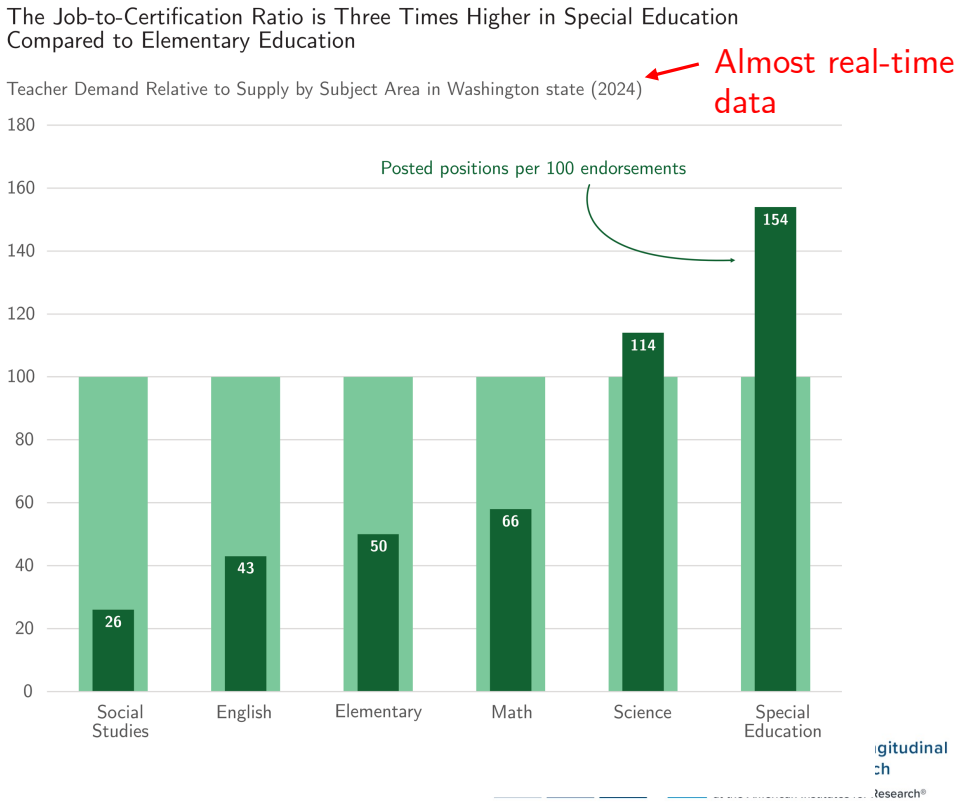
9 States + Metro Atlanta | AIR/CALDER + 10 Partner Institutions

Sneak Preview: How CALDER R&R is Using Robust Supply & Demand Data

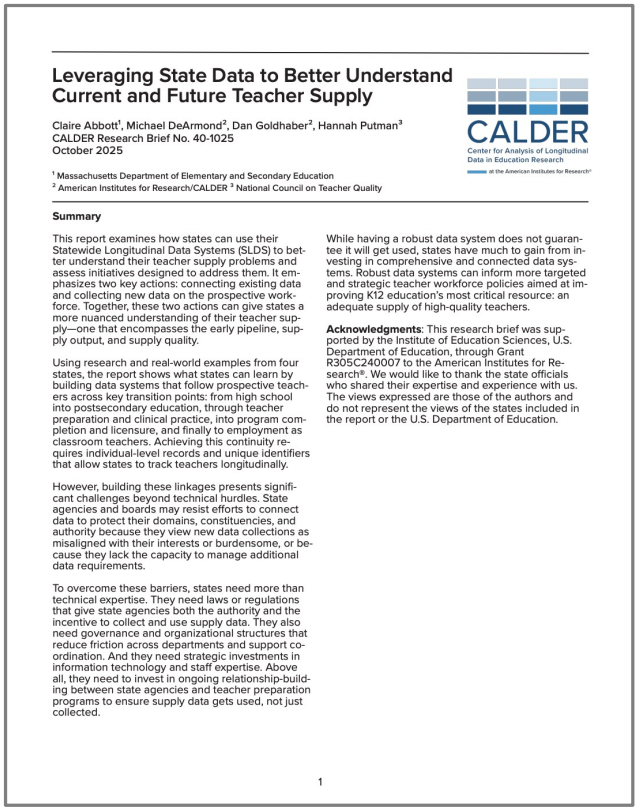
CALDER R&R Information Experiment

- How (if at all) would prospective teachers' decisions about specialization and job search change if they had information about their job prospects earlier?
- To find out, we're conducting an information experiment with 13 teacher preparation programs across 3 states.

Examining Supply and Demand Post-Pandemic



Answering Key Questions Requires Robust Data



Leveraging State Data to Better Understand Current and Future Teacher Supply

Claire Abbott[1], Michael DeArmond[2], Dan Goldhaber[2], Hannah Putman[3]
CALDER Research Brief No. 40-1025
October 2025

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[1] Massachusetts Department of Elementary and Secondary Education
[2] American Institutes for Research/CALDER [3] National Council on Teacher Quality

Summary

This report examines how states can use their Statewide Longitudinal Data Systems (SLDS) to better understand their teacher supply problems and assess initiatives designed to address them. It emphasizes two key actions: connecting existing data and collecting new data on the prospective workforce. Together, these two actions can give states a more nuanced understanding of their teacher supply—one that encompasses the early pipeline, supply output, and supply quality.

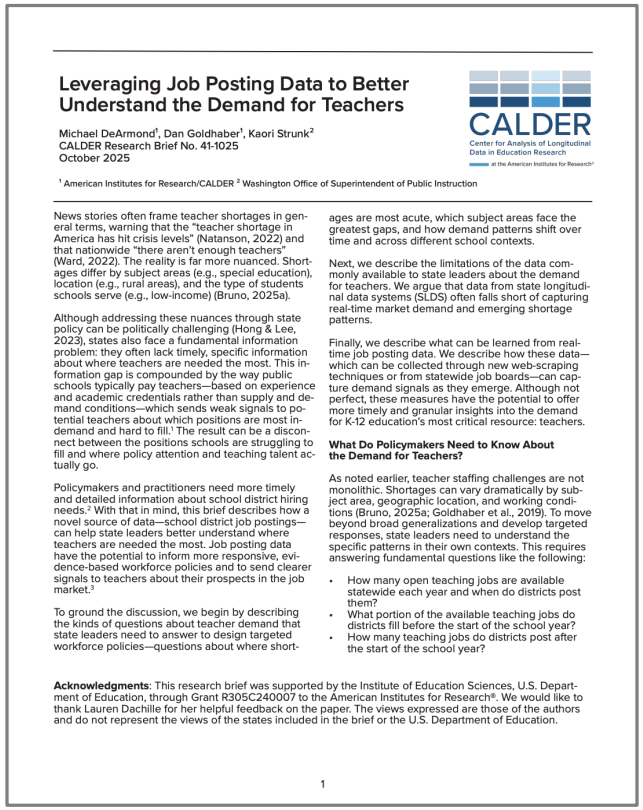
Using research and real-world examples from four states, the report shows what states can learn by building data systems that follow prospective teachers across key transition points: from high school into postsecondary education, through teacher preparation and clinical practice, into program completion and licensure, and finally to employment as classroom teachers. Achieving this continuity requires individual-level records and unique identifiers that allow states to track teachers longitudinally.

However, building these linkages presents significant challenges beyond technical hurdles. State agencies and boards may resist efforts to connect data to protect their domains, constituencies, and authority because they view new data collections as misaligned with their interests or burdensome, or because they lack the capacity to manage additional data requirements.

To overcome these barriers, states need more than technical expertise. They need laws or regulations that give state agencies both the authority and the incentive to collect and use supply data. They also need governance and organizational structures that reduce friction across departments and support coordination. And they need strategic investments in information technology and staff expertise. Above all, they need to invest in ongoing relationship-building between state agencies and teacher preparation programs to ensure supply data gets used, not just collected.

While having a robust data system does not guarantee it will get used, states have much to gain from investing in comprehensive and connected data systems. Robust data systems can inform more targeted and strategic teacher workforce policies aimed at improving K12 education's most critical resource: an adequate supply of high-quality teachers.

Acknowledgments: This research brief was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305C240007 to the American Institutes for Research®. We would like to thank the state officials who shared their expertise and experience with us. The views expressed are those of the authors and do not represent the views of the states included in the report or the U.S. Department of Education.



Leveraging Job Posting Data to Better Understand the Demand for Teachers

Michael DeArmond[1], Dan Goldhaber[1], Kaori Strunk[2]
CALDER Research Brief No. 41-1025
October 2025

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[1] American Institutes for Research/CALDER [2] Washington Office of Superintendent of Public Instruction

News stories often frame teacher shortages in general terms, warning that the "teacher shortage in America has hit crisis levels" (Natanson, 2022) and that nationwide "there aren't enough teachers" (Ward, 2022). The reality is far more nuanced. Shortages differ by subject areas (e.g., special education), location (e.g., rural areas), and the type of students schools serve (e.g., low-income) (Bruno, 2025a).

Although addressing these nuances through state policy can be politically challenging (Hong & Lee, 2023), states also face a fundamental information problem: they often lack timely, specific information about where teachers are needed the most. This information gap is compounded by the way public schools typically pay teachers—based on experience and academic credentials rather than supply and demand conditions—which sends weak signals to potential teachers about which positions are most in-demand and hard to fill.[1] The result can be a disconnect between the positions schools are struggling to fill and where policy attention and teaching talent actually go.

Policymakers and practitioners need more timely and detailed information about school district hiring needs.[2] With that in mind, this brief describes how a novel source of data—school district job postings—can help state leaders better understand where teachers are needed the most. Job posting data have the potential to inform more responsive, evidence-based workforce policies and to send clearer signals to teachers about their prospects in the job market.[3]

To ground the discussion, we begin by describing the kinds of questions about teacher demand that state leaders need to answer to design targeted workforce policies—questions about where shortages are most acute, which subject areas face the greatest gaps, and how demand patterns shift over time and across different school contexts.

Next, we describe the limitations of the data commonly available to state leaders about the demand for teachers. We argue that data from state longitudinal data systems (SLDS) often falls short of capturing real-time market demand and emerging shortage patterns.

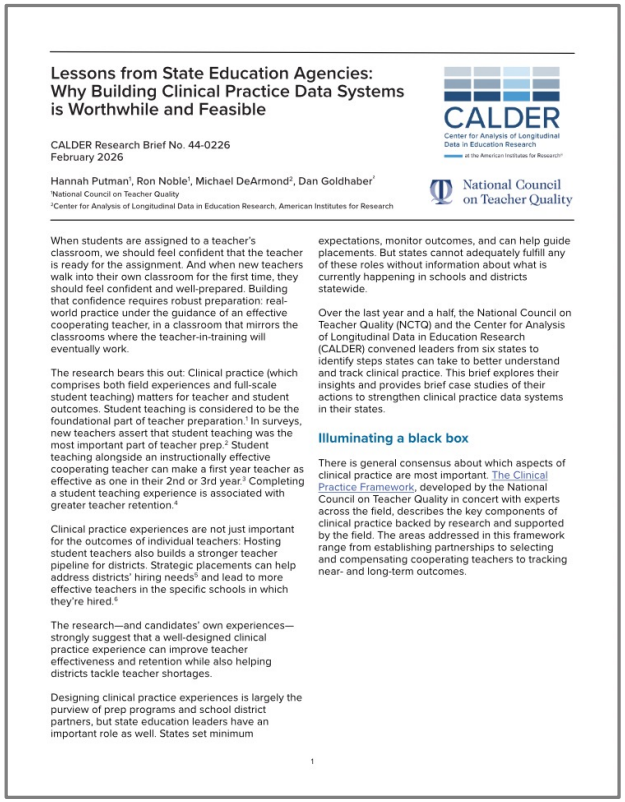
Finally, we describe what can be learned from real-time job posting data. We describe how these data—which can be collected through new web-scraping techniques or from statewide job boards—can capture demand signals as they emerge. Although not perfect, these measures have the potential to offer more timely and granular insights into the demand for K-12 education's most critical resource: teachers.

What Do Policymakers Need to Know About the Demand for Teachers?

As noted earlier, teacher staffing challenges are not monolithic. Shortages can vary dramatically by subject area, geographic location, and working conditions (Bruno, 2025a; Goldhaber et al., 2019). To move beyond broad generalizations and develop targeted responses, state leaders need to understand the specific patterns in their own contexts. This requires answering fundamental questions like the following:

- How many open teaching jobs are available statewide each year and when do districts post them?
- What portion of the available teaching jobs do districts fill before the start of the school year?
- How many teaching jobs do districts post after the start of the school year?

Acknowledgments: This research brief was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305C240007 to the American Institutes for Research®. We would like to thank Lauren Dachille for her helpful feedback on the paper. The views expressed are those of the authors and do not represent the views of the states included in the brief or the U.S. Department of Education.



Lessons from State Education Agencies: Why Building Clinical Practice Data Systems is Worthwhile and Feasible

CALDER Research Brief No. 44-0226
February 2026

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Hannah Putman[1], Ron Noble[1], Michael DeArmond[2], Dan Goldhaber[1]
[1]National Council on Teacher Quality
[2]Center for Analysis of Longitudinal Data in Education Research, American Institutes for Research

National Council on Teacher Quality

When students are assigned to a teacher's classroom, we should feel confident that the teacher is ready for the assignment. And when new teachers walk into their own classroom for the first time, they should feel confident and well-prepared. Building that confidence requires robust preparation: real-world practice under the guidance of an effective cooperating teacher, in a classroom that mirrors the classrooms where the teacher-in-training will eventually work.

The research bears this out: Clinical practice (which comprises both field experiences and full-scale student teaching) matters for teacher and student outcomes. Student teaching is considered to be the foundational part of teacher preparation.[1] In surveys, new teachers assert that student teaching was the most important part of teacher prep.[2] Student teaching alongside an instructionally effective cooperating teacher can make a first year teacher as effective as one in their 2nd or 3rd year.[3] Completing a student teaching experience is associated with greater teacher retention.[4]

Clinical practice experiences are not just important for the outcomes of individual teachers: Hosting student teachers also builds a stronger teacher pipeline for districts. Strategic placements can help address districts' hiring needs[5] and lead to more effective teachers in the specific schools in which they're hired.[6]

The research—and candidates' own experiences—strongly suggest that a well-designed clinical practice experience can improve teacher effectiveness and retention while also helping districts tackle teacher shortages.

Designing clinical practice experiences is largely the purview of prep programs and school district partners, but state education leaders have an important role as well. States set minimum expectations, monitor outcomes, and can help guide placements. But states cannot adequately fulfill any of these roles without information about what is currently happening in schools and districts statewide.

Over the last year and a half, the National Council on Teacher Quality (NCTQ) and the Center for Analysis of Longitudinal Data in Education Research (CALDER) convened leaders from six states to identify steps states can take to better understand and track clinical practice. This brief explores their insights and provides brief case studies of their actions to strengthen clinical practice data systems in their states.

Illuminating a black box

There is general consensus about which aspects of clinical practice are most important. The Clinical Practice Framework, developed by the National Council on Teacher Quality in concert with experts across the field, describes the key components of clinical practice backed by research and supported by the field. The areas addressed in this framework range from establishing partnerships to selecting and compensating cooperating teachers to tracking near- and long-term outcomes.

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Today's Agenda

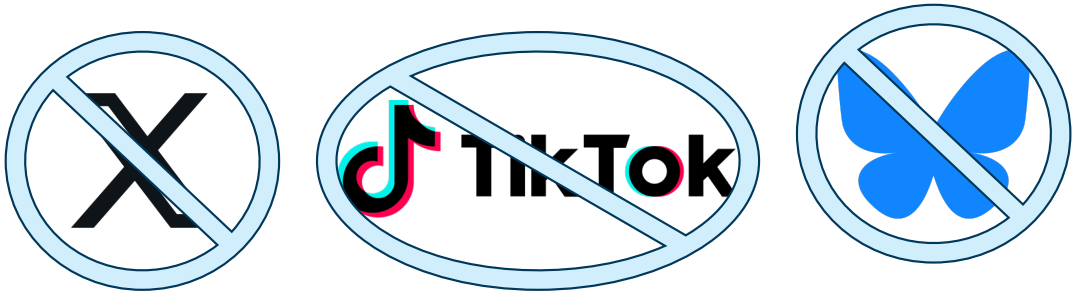
Time	Session
9:00 a.m.—9:15 a.m.	Welcome & Announcements
9:15 a.m.—10:45 a.m.	Session I: Evidence on Teacher Working Conditions: Daily Realities, Leadership, and Labor Action
10:45 a.m.—12:15 a.m.	Session II: Evidence on what Makes Teachers Stay: Schedules, Salaries, and School Leaders
12:15 a.m.—1:00 p.m.	Get lunch, come back here
1:00 p.m.—2:30 p.m.	Session III: Who Becomes a Teacher? Selection Across Preparation and Hiring Pipelines
2:30 p.m.—4:00 p.m.	Session IV: Roundtable Discussion: What's Next? Education Research and Policy at at Crossroads

- 20-minute presentations—**watch Anna**!
- Discussants for sessions I, II, and III.
- 15-minutes audience Q&A—save your questions

Some Papers, Some Preliminary Results

For online agenda with links to available papers

If not ready for posting yet…



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Session I: Evidence on Teacher Working Conditions: Daily Realities, Leadership, and Labor Action

Paper Presentations

- **To Make Teaching Sustainable, Help Teachers Balance Work and Personal Demands—Findings from the 2025 State of the American Teacher Survey**. Elizabeth Steiner, RAND, CALDER-R&R
- **Principal Effects on Teacher Working Conditions.** Cory Koedel, University of Missouri, CALDER-R&R
- **The Causes and Consequences of U.S. Teacher Strikes.** Melissa Arnold Lyon (Mimi), University at Albany SUNY, CALDER-R&R

Discussant

- **Marla Ucelli-Kashyap,** Senior Director for Educational Issues, American Federation of Teachers

To Make Teaching Sustainable, Improve Teachers' Work-Life Balance—Findings from the State of the American Teacher Survey

Elizabeth D. Steiner, RAND

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Overview of this presentation

Overview

Key findings

Discussion and Q&A

Topics covered in this presentation:

1) Job flexibility and job intrusion
2) Hours spent on work and household duties
3) Employer-provided benefit packages
4) Relationship between work-life balance and well-being
5) Implications

American Educator Panels (AEP) Overview

The AEP are **nationally representative panels of 27,000+ PK-12 teachers, 8,000+ principals, and 1000+ superintendents.**

Through the AEP, we strive to provide **better educator representation** than many other national surveys through probability-based samples.

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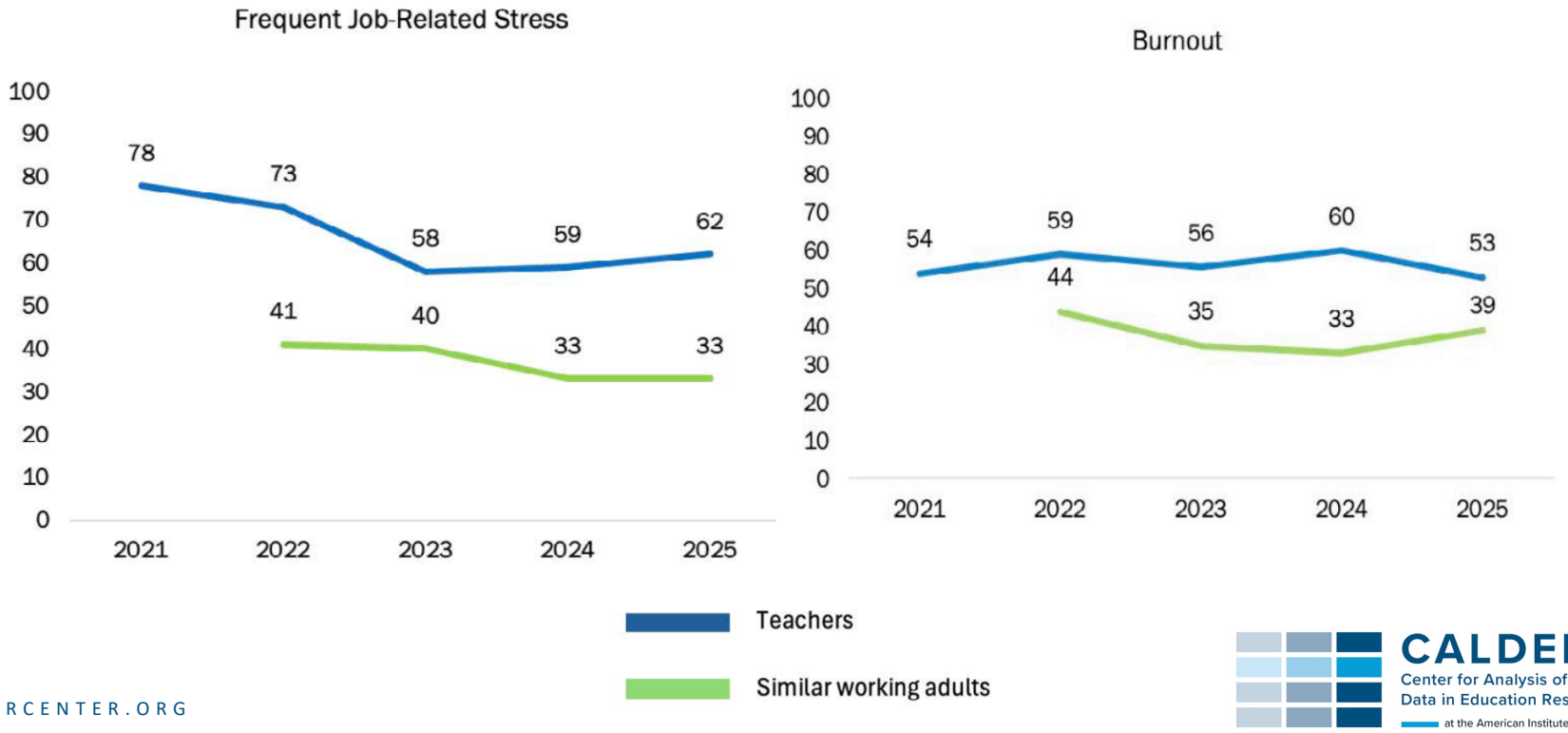
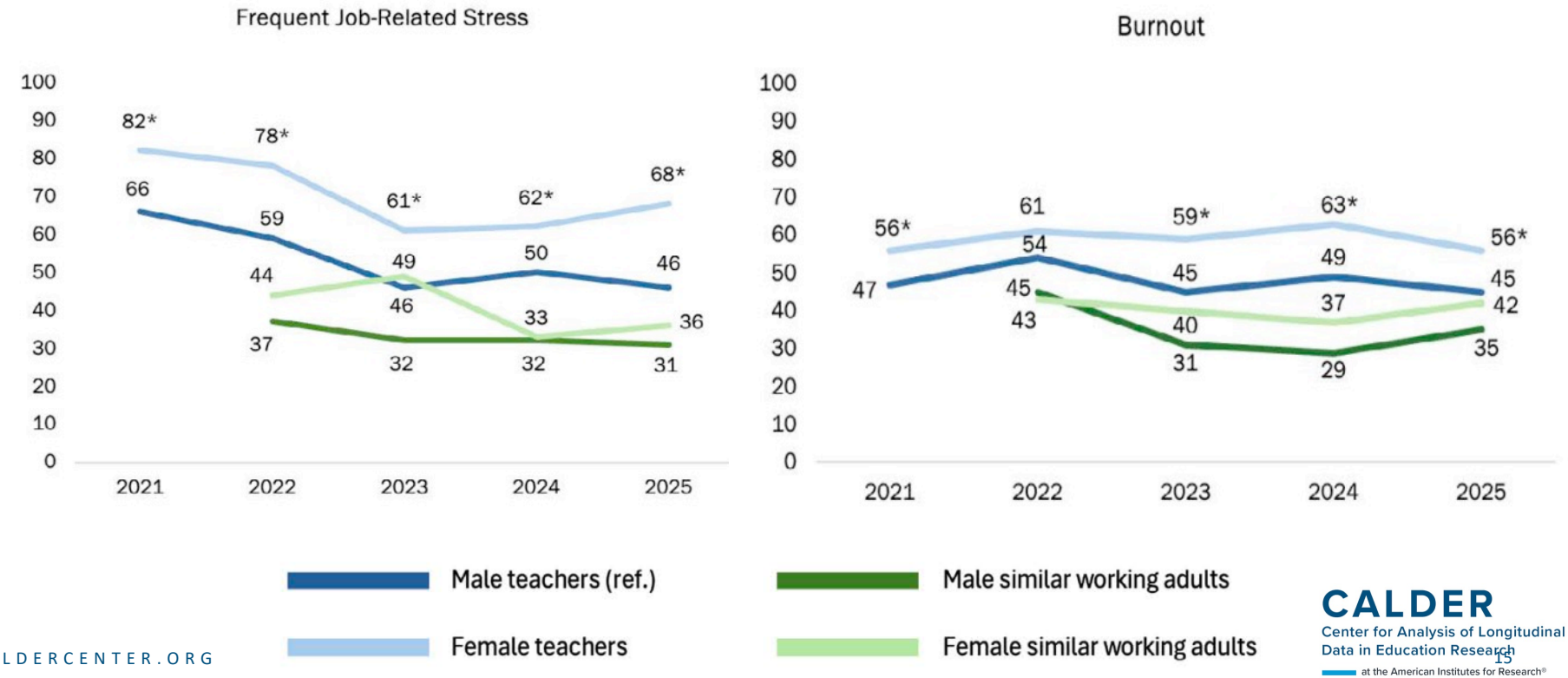
State of the American Teacher Survey Overview

- National sample of K-12 public school teachers
- Focuses on teacher working conditions, well-being, and intentions to remain in the workforce
- Fielded yearly since January 2021
- Companion survey of similar working adults provides context for teachers' responses
- 2022-2025 surveys oversampled teachers who identify as Black/African American or Hispanic/Latinx
- 2026 survey includes selected NTPS items

More Teachers Experience Job-Related Stress and Burnout Than Similar Working Adults



Female Teachers More Likely To Experience Job Stress and Burnout Than Male Teachers and Female Working Adults



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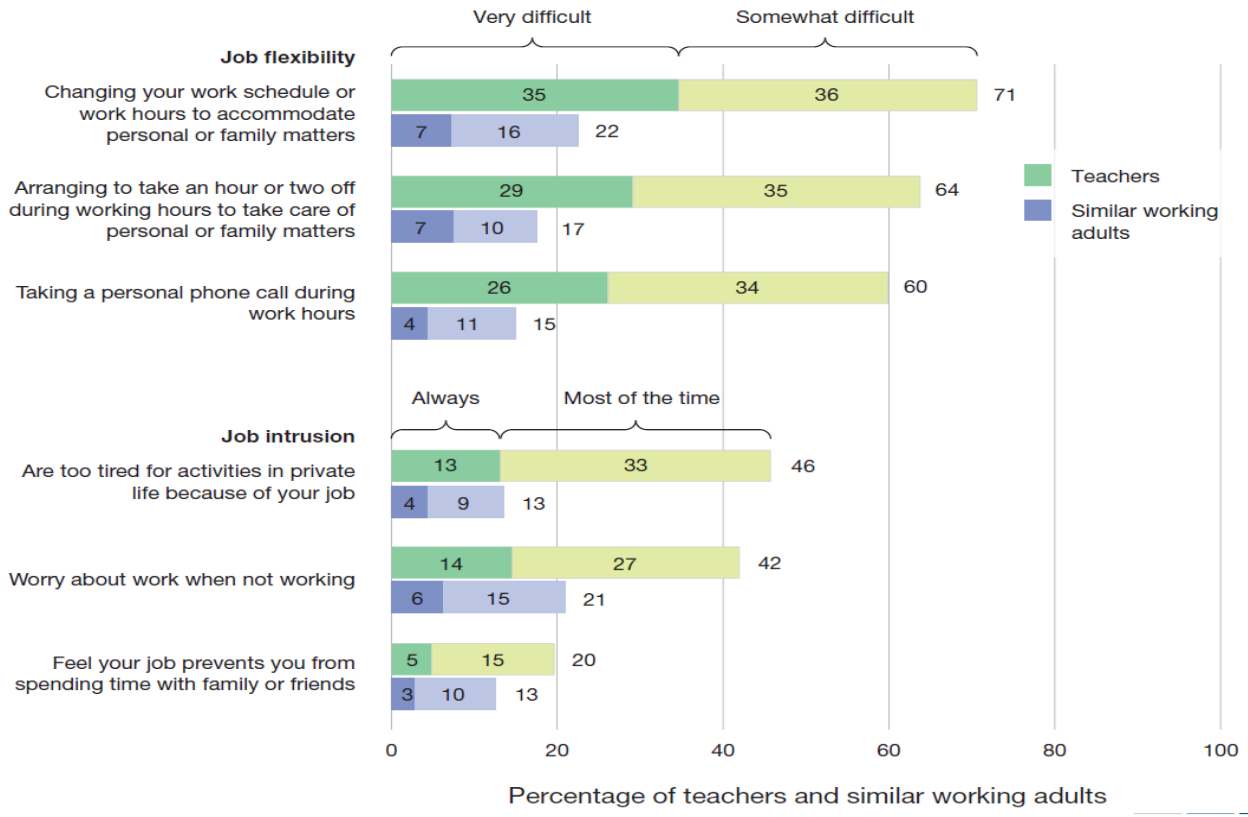
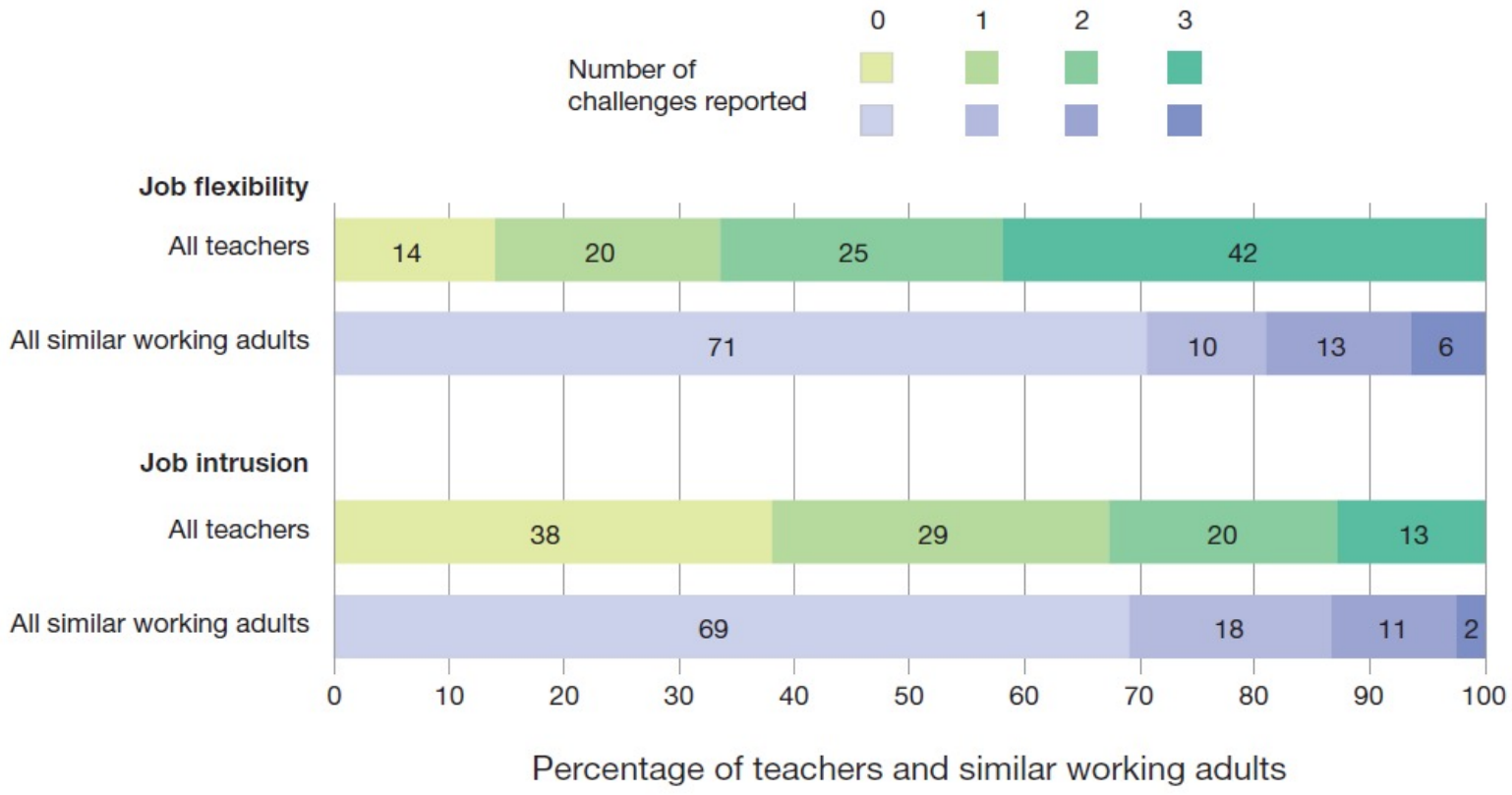
Teachers Reported Worse Work-Life Balance Than Similar Working Adults

FIGURE 1

Teachers' and Similar Working Adults' Perceptions of Work-Life Balance



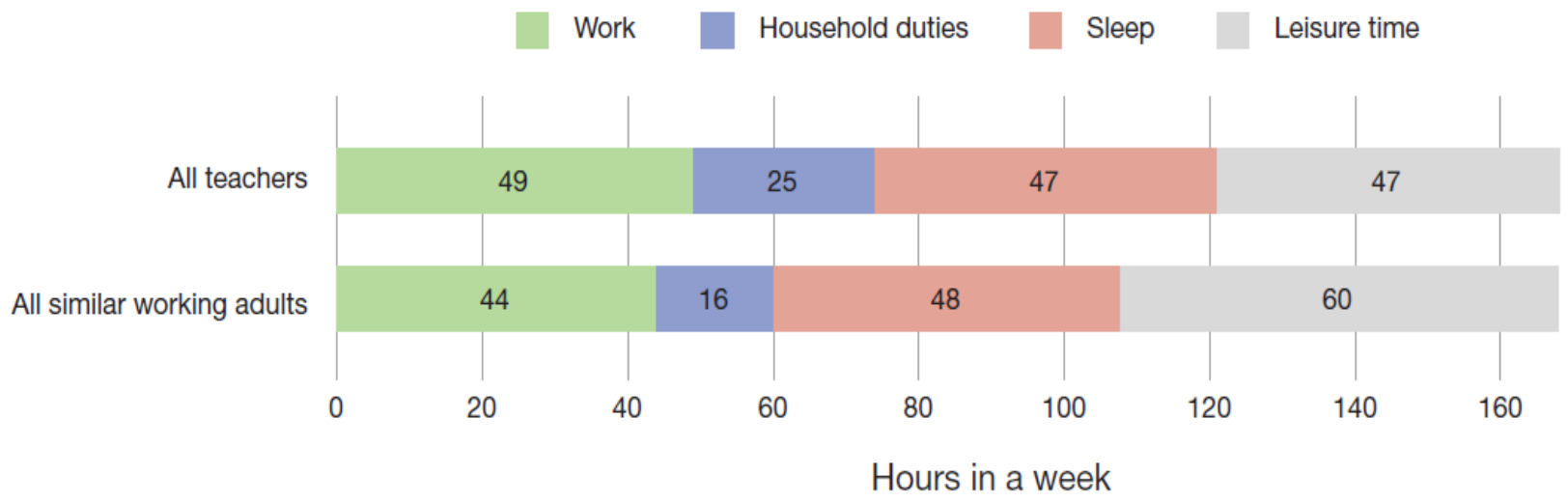
Four in Ten Teachers Struggled with All Three Aspects of Job Flexibility



Teachers Spent More Time Working and on Household Duties Than Similar Working Adults

FIGURE 3

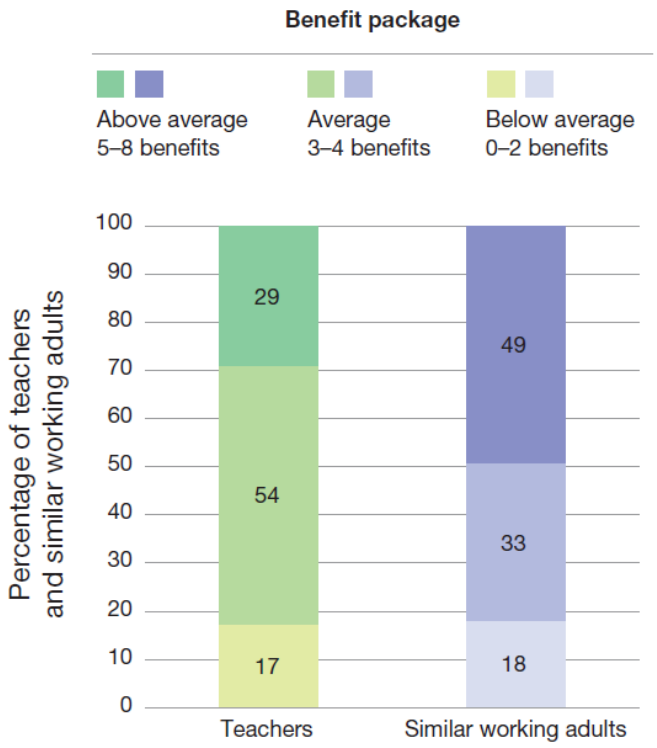
Teachers' and Similar Working Adults' Weekly Hours Spent on Work, Household Duties, and Sleep



Teacher's Benefit Packages Were Unlikely to Support Work-Life Balance

FIGURE 4

Employer-Provided Benefit Packages Reported by Teachers and Similar Working Adults



		Teachers	Similar working adults
Above average	Average paid sick days	13	19
	Average paid personal time off days	4	25
Average	Average paid sick days	10	12
	Average paid personal time off days	5	18
Below average	Average paid sick days	9	6
	Average paid personal time off days	5	10

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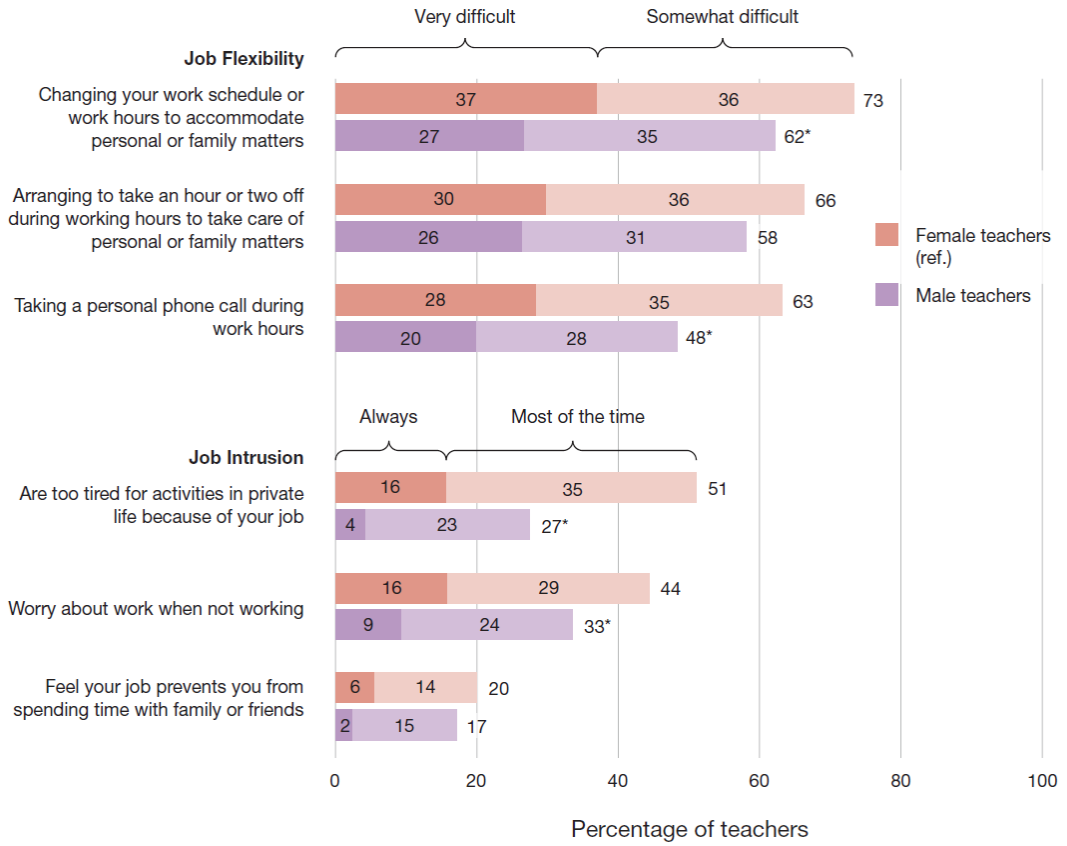
Female Teachers Were More Likely Than Male Teachers to Report Poor Work-Life Balance

FIGURE 5

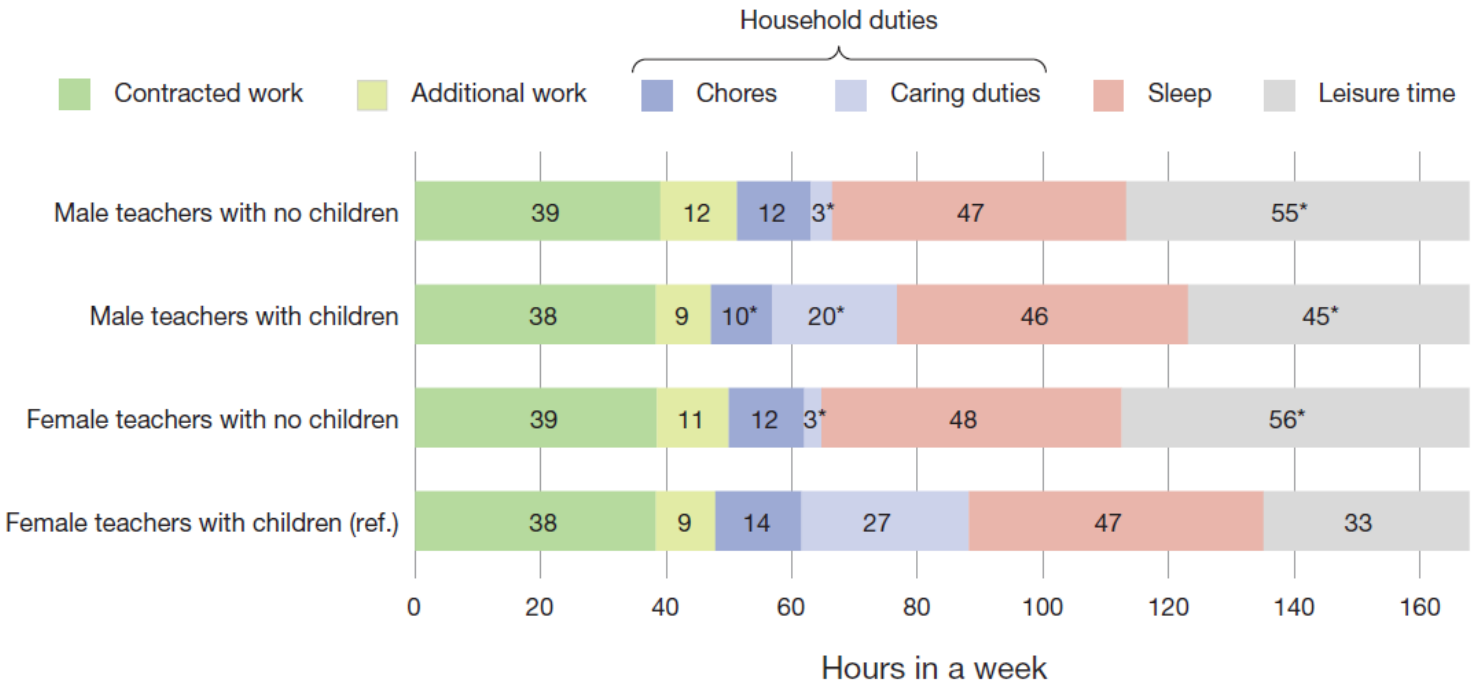
Teachers' Perceptions of Work-Life Balance, by Gender



Female Teachers with Children Worked a Second Shift

FIGURE 6

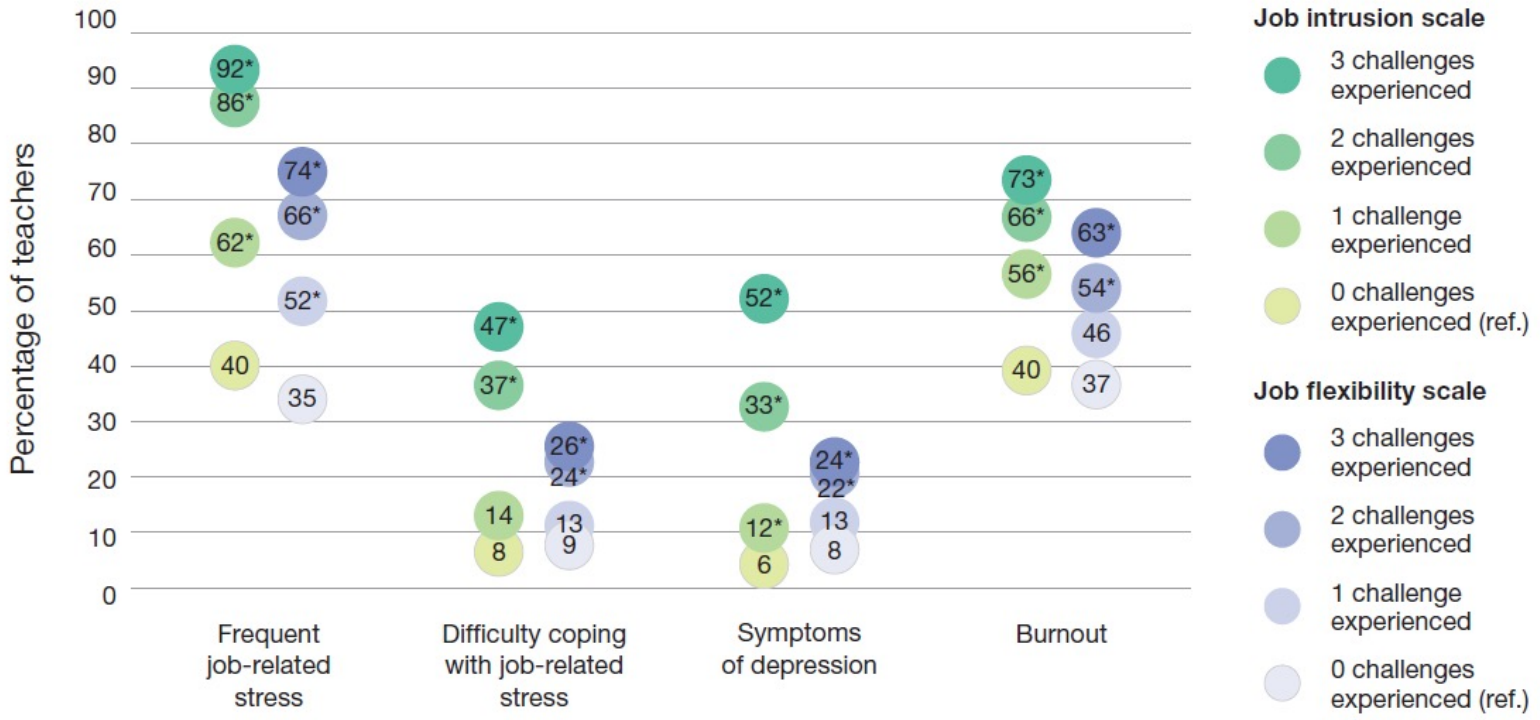
Teachers' Weekly Hours Spent on Work, Household Duties, and Sleep, by Gender and Parental Status



Teachers Who Experienced Worse Work-Life Balance Reported Worse Well-Being

FIGURE 7

Teachers' Well-Being by Number of Job Intrusion and Job Flexibility Challenges Experienced



Ease of Taking Time Off, Schedule Flexibility, and Access to Classroom Coverage Could Support Work-Life Balance

Support Work-Life Balance

- Time off
- Schedule flexibility
- Wellness supports
- Classroom coverage

Schedule flexibility

"My principal will allow me to leave a few minutes early if I have an appointment. Sometimes we can leave early on a day where we have professional development [PD]. We occasionally can work from another location during our PD time. I find these small allowances helpful."

—Elementary education teacher

Access to coverage

"Teachers work together to cover other teachers' classes if one has to leave for a family emergency/personal issue. [The] secretary works hard to help find teachers if a substitute is not available."

—High school science teacher

Difficulty Taking Paid Leave and Finding Substitutes Detracted from Work-Life Balance

Difficulties taking paid leave

"We get five personal days and five sick days each year, but we are chastised by our principal and given a warning if we use more than six days in one year."

—*High school teacher*

Difficulties finding quality substitutes

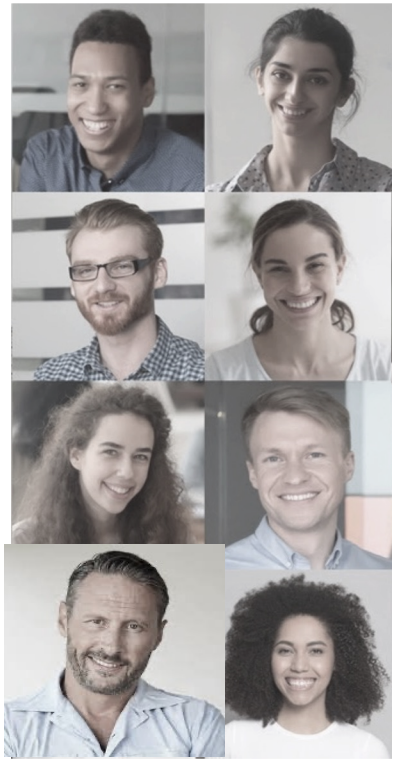
"The pool of quality substitutes is dwindling, and I feel guilty for taking time off for personal responsibilities. I try not to take precious instructional time off with the students."

—*Middle school math teacher*

Detract from Work-Life Balance

- Difficulty taking paid leave
- Increasing workload
- Ineffective supports
- Difficulty finding quality substitutes

Implications



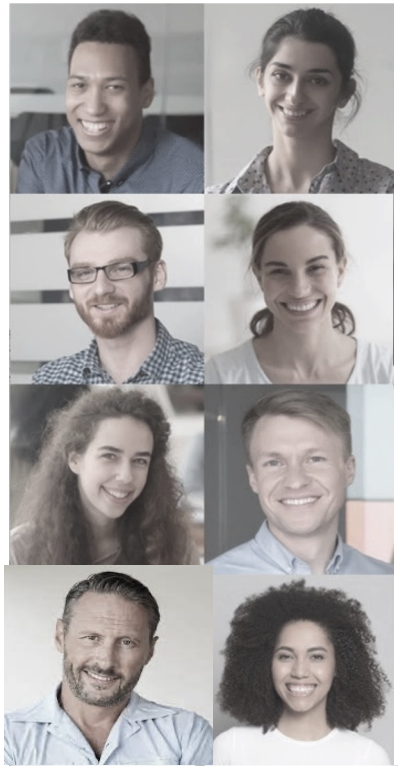
Teachers reported worse well-being and worse work-life balance than similar working adults

Differences in work-life balance between male and female teachers were largely explained by female teachers with children

Poor work-life balance is highly correlated with poor well-being

Fewer than one-half of teachers said their school or district made efforts to help teachers balance work and life – this is an area for growth

Recommendations



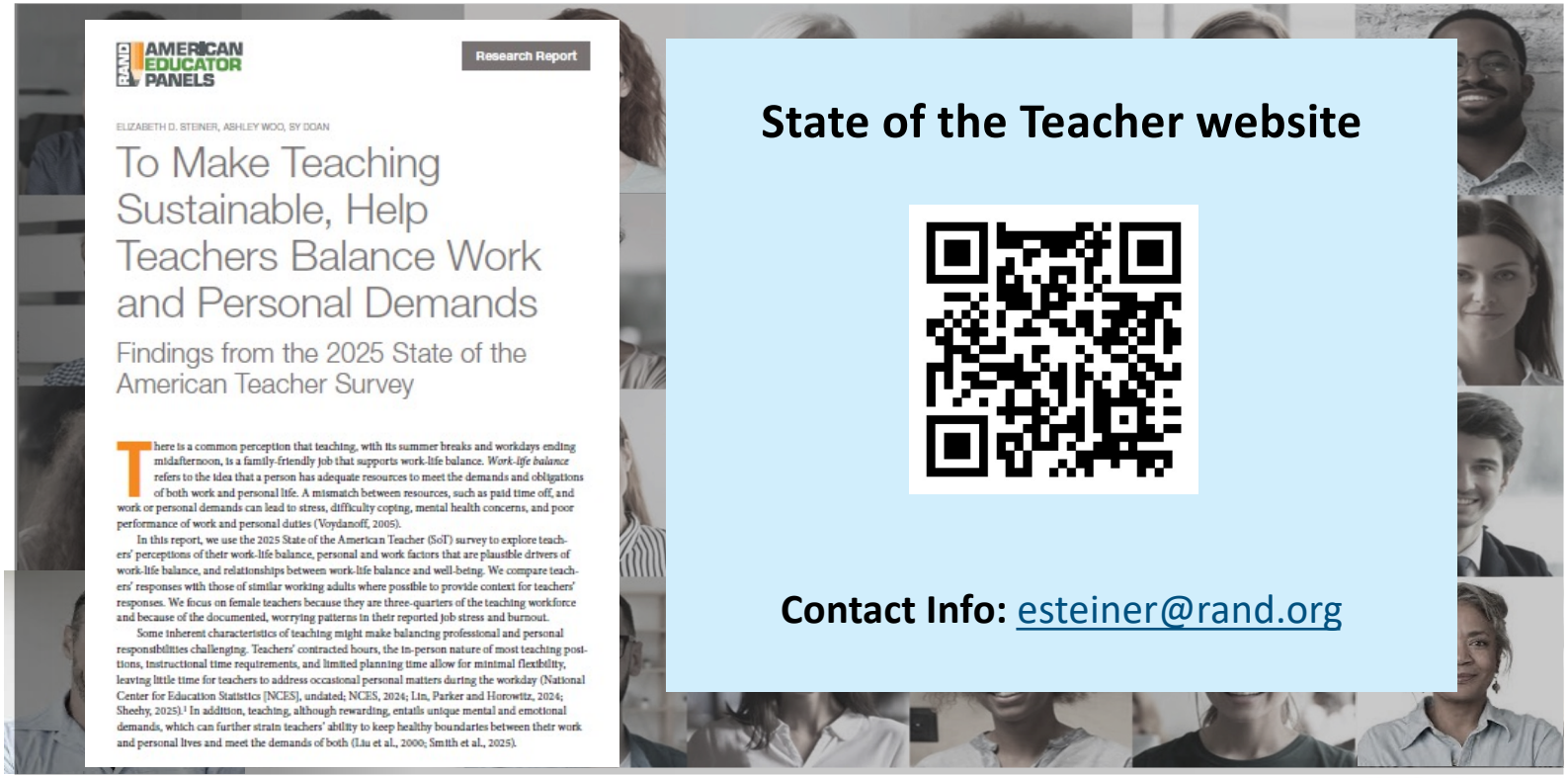
Allow teachers to flexibly use paid leave and provide classroom coverage to support instructional quality

Consider flexible job options, such as team teaching or job-sharing opportunities

Provide teachers with benefits that could alleviate household responsibilities

Message and expect work-life balance and set work boundaries

Thank you!



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Principal Effects on Teacher Working Conditions

Ataur Rahaman, University of Missouri

Cory Koedel, CALDER and University of Missouri

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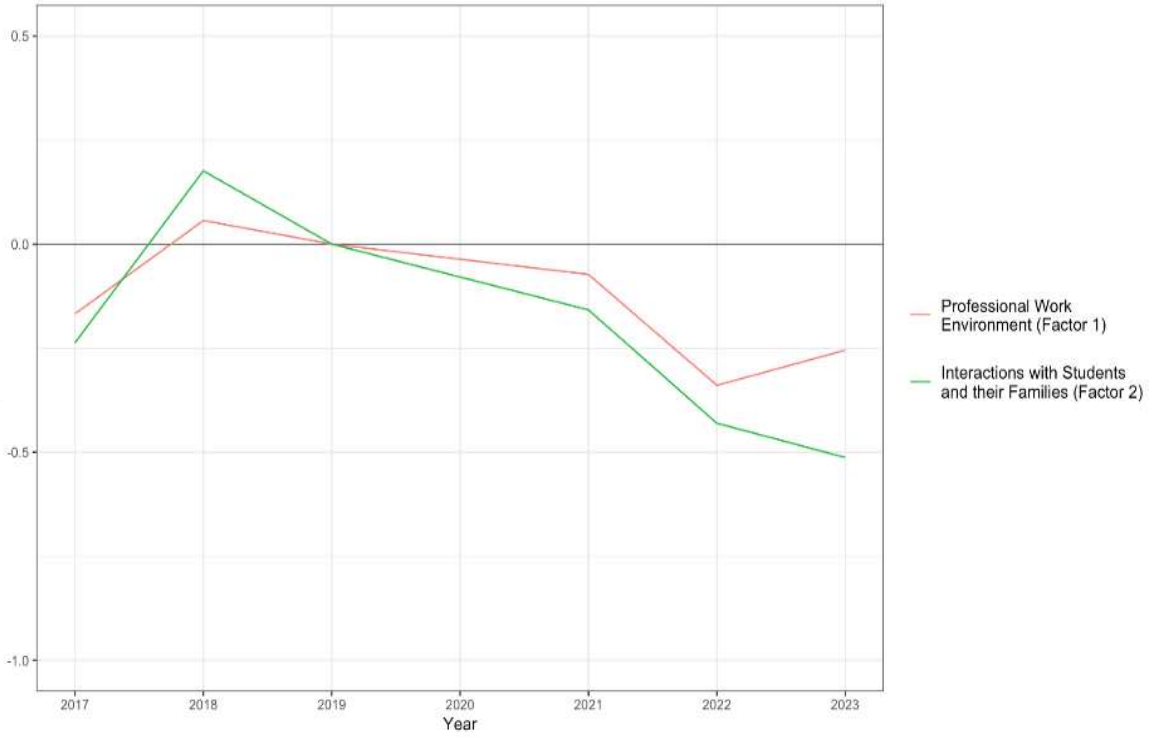
Background & Motivation

- Teacher working conditions declined with the onset of the COVID pandemic and the decline continued through at least 2023 (Baker and Koedel, forthcoming).



Background & Motivation

- The recent decline in teacher working conditions contributes to a broader, long-run decline in professional prestige and teacher job satisfaction (Kraft and Lyon, 2024).
  - This is starting to catch on in the media (The Hechinger Report & LA Times: Biting, Kicking, and Wandering…).
  - Since the pandemic, there is evidence that non-teaching employees are also less satisfied with work.

- Teacher working conditions matter.
  - Schools with better teacher working conditions have higher achievement growth, even among observationally similar schools (Ferguson and Hirsch, 2015; Johnson, Kraft, and Papay, 2012; Kraft, Marinell, and Yee, 2016).
  - Teachers report valuing their working conditions over other aspects of their jobs, including compensation and student demographics (Grissom, Viano, and Selin, 2015; Horng, 2009).

- How can we intervene to improve working conditions?
  - As managers of schools, principals seem like a good place to start.

Contribution

- We use rich administrative and survey data from Illinois to estimate variance in principal effects on a broad swath of teacher working conditions.
  - How much do principals matter?

Preview of Findings

- We find principals have very large effects on indicators directly related to leadership (0.45-0.66 school-level standard deviations), and small-to-moderate effects on the professional work environment (0.19 standard deviations) and interactions with students and families (0.13 standard deviations).
  - The principal effect size for the latter is on par with the most credible estimates from the test score literature.
  - Our estimates are smaller than in the only other causal study of principal effects on teacher working conditions of which we are aware (Burkhauser, 2017).

- Outside of the leadership-specific indicators, most of the variance in teacher working conditions is not caused by principals.

Data

- Our data on working conditions are from the 5Essentials (5E) Survey in Illinois, which has been administered annually in Illinois for many years. Since 2019 the 5E Survey has:
  - Excellent school coverage—80 percent of schools, 90+ percent of students.
  - A high teacher response rate—75-82 percent annually (conditional on school participation).

- The survey includes 20 different teacher working condition Measures that comprise over 100 individual survey items.
  - The 20 Measures span most dimensions of working conditions covered in the literature (Merrill, 2021).
  - We analyze two leadership specific indicators separately: teacher-principal trust and instructional leadership
  - We use factor analysis to combine the remaining 18 indicators into two indices that capture the **professional work environment** and teacher **interactions with students and families**.

Data

- We use the 5E Survey data to construct a school-by-year data panel of teacher working conditions, which we merge with administrative personnel data to link working conditions to principals.

- Our data panel spans the years 2019 to 2024.
  - 2020 data are unavailable because COVID hit during the spring survey window and it was cancelled.
  - We confirm our findings are not driven by the pandemic by replicating our substantive findings using a subsample of data from 2022 to 2024.

Methods (Intuitive)

- Our methods follow Bartanen, Husain, and Liebowitz (2024) and are related to similar methods in earlier studies by Branch, Hanushek, and Rivkin (2012) and Coelli and Green (2012).
  - These studies estimate principal effects on student test scores.

- Intuitively, we compare correlations over time in teacher working conditions in schools that do and do not experience principal changes. If principals affect teacher working conditions, outcomes should be more stable in schools with the same principal than in schools where the principal changes.
  - This is a difference-in-differences logic.

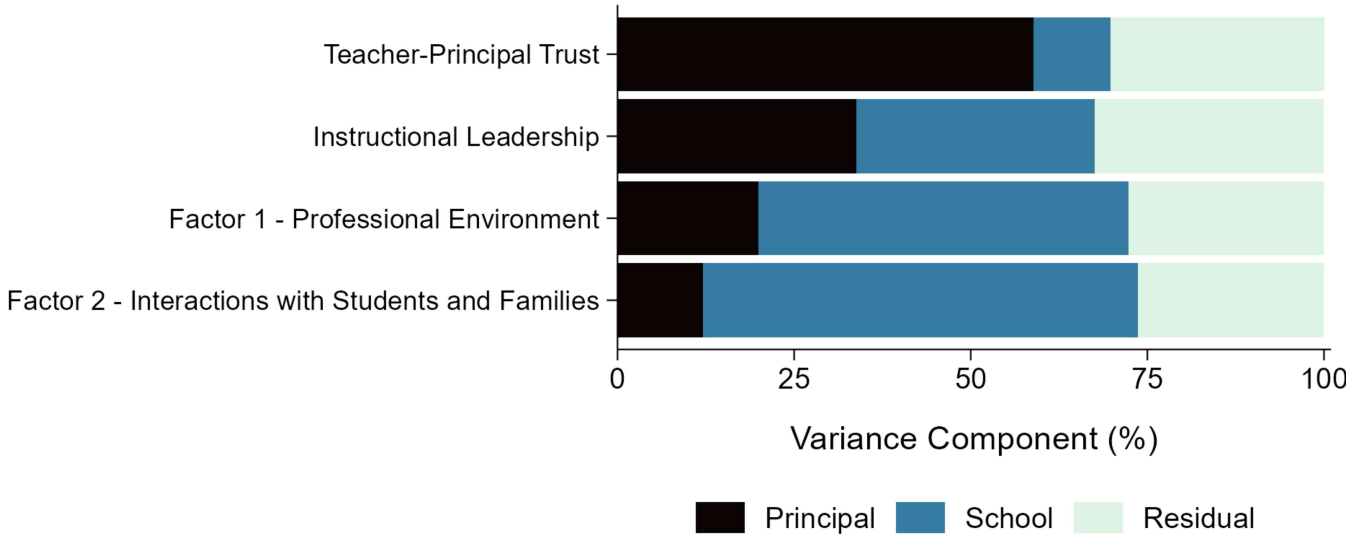
Methods (Details)

- We model teacher working conditions as a function of fixed and dynamic school and principal effects. Using our model, and with some assumptions—most importantly, stationarity of the dynamic effects following Chetty et al. (2014)—the difference in correlations can be used to back out an estimate of the variance of principal effects on teacher working conditions.
  - We're interested in the variance of principal fixed effects, which is the policy-relevant parameter: "How much do differences in principals matter?"

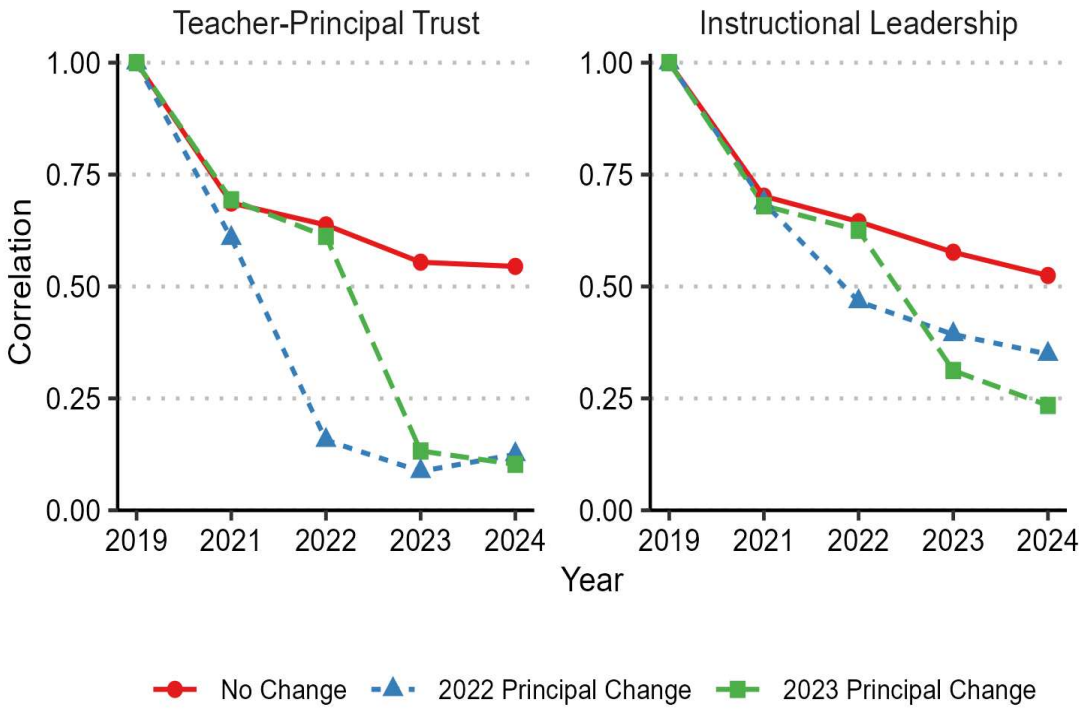
- Most important thing: our approach disentangles fixed principal effects from dynamic school effects—i.e., things that are changing over time in schools but aren't due to the principal.

Basic Variance Decompositions

- We use random effects models to decompose the variance in teacher working conditions into three categories: variance due to principals, schools, and a residual. These simple models likely overstate the principal share.



Simple illustration



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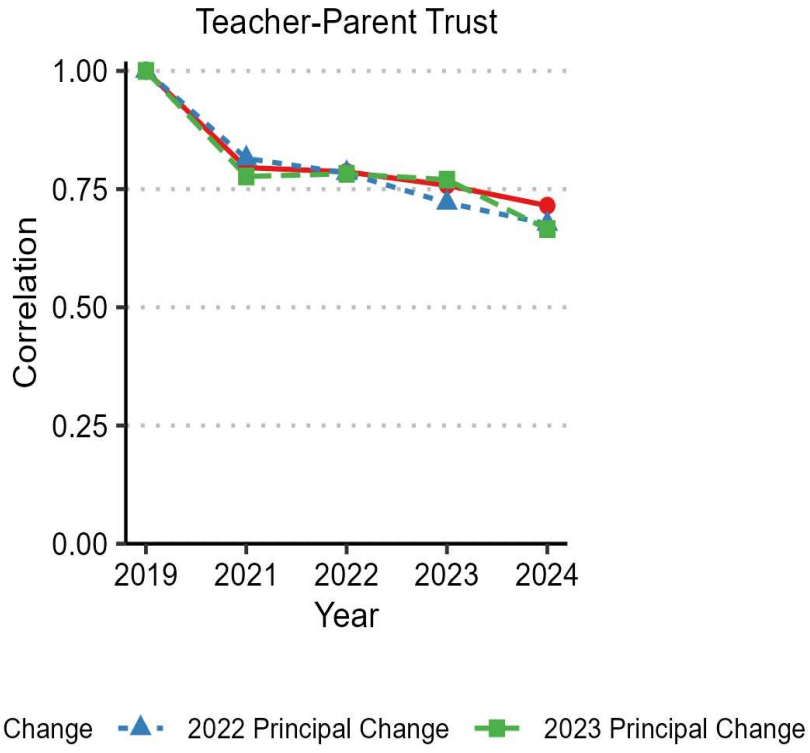
Simple illustration



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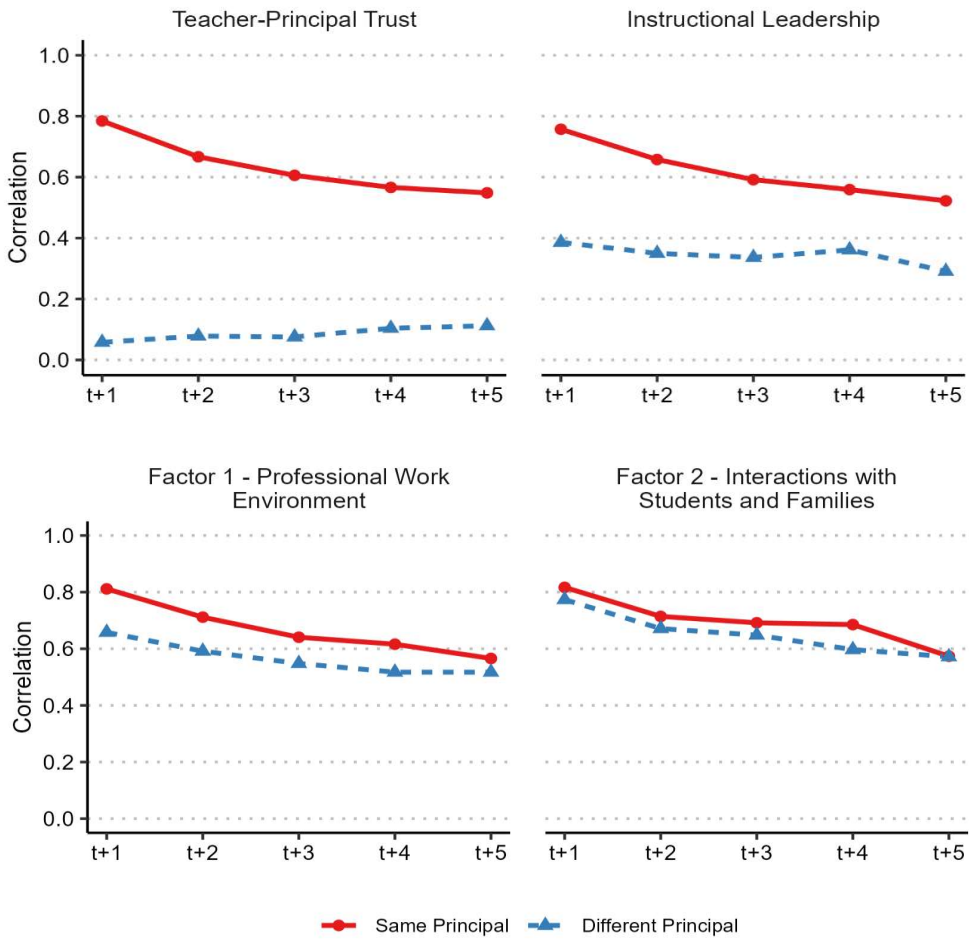
Primary Results



Interpretation

- The differences in correlations imply effect sizes of a one-standard-deviation change in principal quality of:
  - 0.66 for teacher-principal trust (climate-oriented).
  - 0.45 for instructional leadership (task-oriented).
  - 0.19 for the professional work environment.
  - 0.13 for interactions with students and families.

- These effect sizes are in school-level standard deviation units.
  - A one-standard-deviation move in the school distribution is smaller than in the teacher distribution, because it omits within-school variance.

Interpretation

- Studies in the test-score literature report principal effect sizes in the student-level distribution rather than school- level distribution.
  - While noting this reporting norm is desirable for comparisons to other studies, and there is nothing wrong with it mathematically, it attenuates implied principal effects by scaling them using variation they do not influence (i.e., within school variation).

- Adjusting for the scaling difference, and using estimates from test score studies that use similar methods to our own, we find:
  - Principal effects on leadership-related working conditions are much larger than their test-score effects.
  - Principal effects on the professional work environment are modestly larger than their test-score effects.
  - Principal effects on teachers' interactions with students and families are very similar in magnitude to their test-score effects.

Interpretation

- Whether our estimates are viewed as large or small is in the eye of the beholder.
- Our interpretation: Our findings indicate principal-centered interventions can be part of the solution to the working conditions problem in our schools, but:
  - Most of the variance in (non-leadership) working conditions is attributable to factors other than principals, so principal-centered interventions are likely a partial solution at best.
  - Principal effects are smallest on working conditions related to teachers' interactions with students and families, which have seen the greatest decline since the onset of the COVID-19 pandemic (Baker and Koedel, forthcoming).

The Effects of Teacher Strikes on Compensation, Working Conditions, and Productivity

Melissa Arnold Lyon (Mimi), University at Albany, SUNY

Matthew A. Kraft, Brown University

Matthew Steinberg, Accelerate

Note: NATIONAL ACADEMY of EDUCATION SPENCER FOUNDATION

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Motivation

Context:

- Organized labor in decline since 1970s: 60% drop in unionization
- Strikes seen as ineffective post-PATCO (1981) (Massenkoff and Wilmers 2024; Naidu 2022; Rosenfeld 2006)
- But major resurgence in (teacher) strikes since 2018
  – 379,000 of 485,200 workers in large work stoppages were teachers

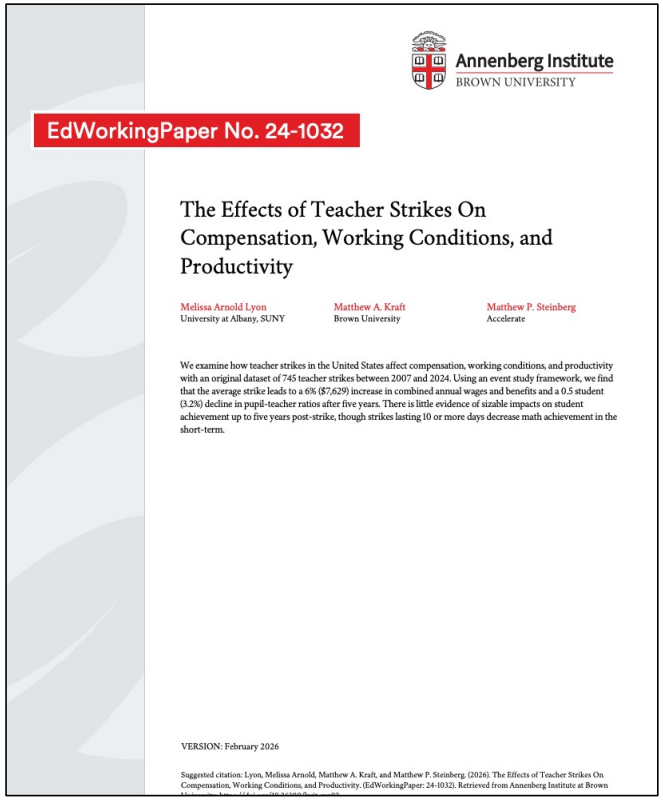
Why study teacher strikes?

- Teachers = 5% of college-educated workforce (3.7M nationally)
- 18% of all union members are public school teachers
- Teachers matter (Goldhaber 2016)

Study Overview

- **RQ:** How common are US teacher strikes and why do they occur? How do teacher strikes affect compensation, working conditions, and achievement?
- **Data (2007-present):** Original national strike database + CCD + SEDA
- **Method:** Event Study (Callaway & Sant'Anna 2020)
- **Findings:**
  - 745 strikes (2007-2024), mostly brief (median: 2 days)
  - Large effects on compensation: +6% ($7,629) by year 5
  - Improved working conditions: -0.5 students in pupil-teacher ratio
  - No average effects on achievement within 5 years

Working Paper Available



Annenberg Institute
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EdWorkingPaper No. 24-1032

The Effects of Teacher Strikes On Compensation, Working Conditions, and Productivity

Melissa Arnold Lyon
University at Albany, SUNY

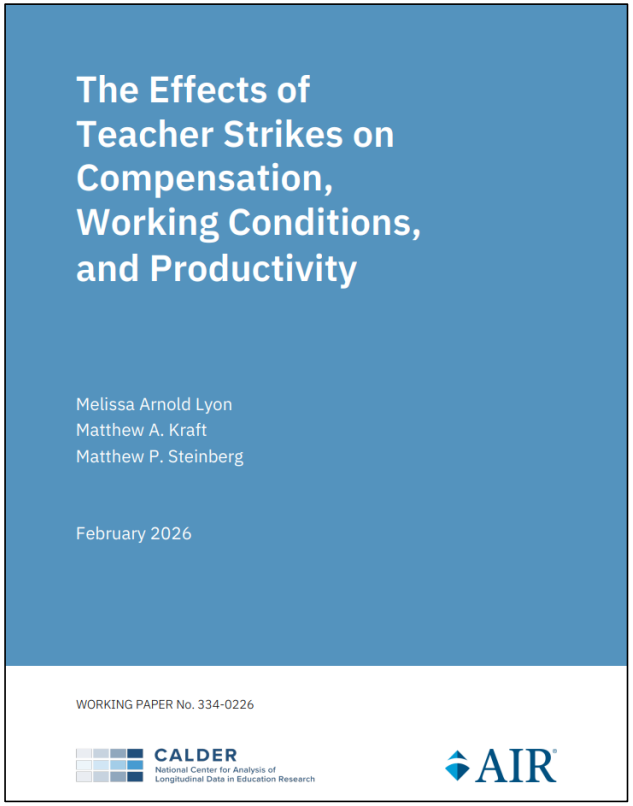
Matthew A. Kraft
Brown University

Matthew P. Steinberg
Accelerate

We examine how teacher strikes in the United States affect compensation, working conditions, and productivity with an original dataset of 745 teacher strikes between 2007 and 2024. Using an event study framework, we find that the average strike leads to a 6% ($7,629) increase in combined annual wages and benefits and a 0.5 student (3.2%) decline in pupil-teacher ratios after five years. There is little evidence of sizable impacts on student achievement up to five years post-strike, though strikes lasting 10 or more days decrease math achievement in the short-term.

VERSION: February 2026

Suggested citation: Lyon, Melissa Arnold, Matthew A. Kraft, and Matthew P. Steinberg. (2026). The Effects of Teacher Strikes On Compensation, Working Conditions, and Productivity. (EdWorkingPaper: 24-1032). Retrieved from Annenberg Institute at Brown



The Effects of Teacher Strikes on Compensation, Working Conditions, and Productivity

Melissa Arnold Lyon
Matthew A. Kraft
Matthew P. Steinberg

February 2026

WORKING PAPER No. 334-0226

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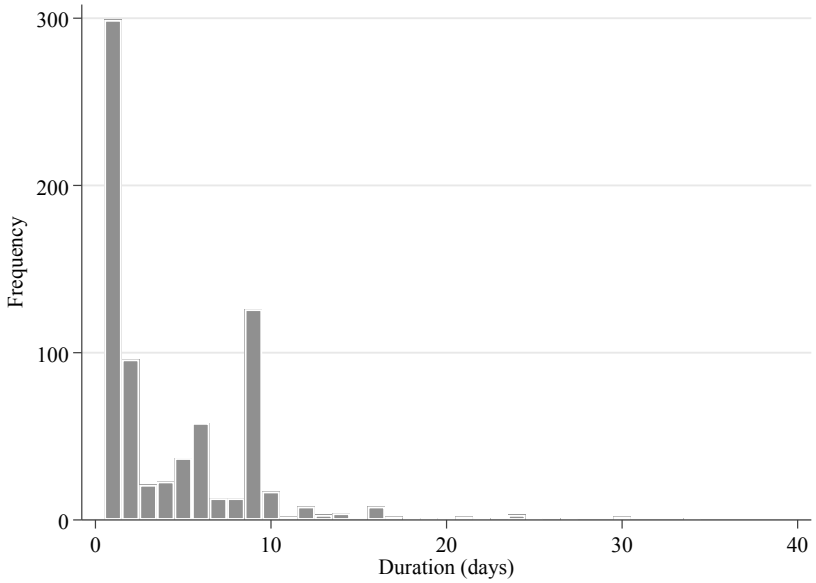
Original Database on Teacher Strikes

- **Data Collection (2007-2024):**
  - 745 strikes in 592 districts across 27 states
  - Review of ~90,000 news articles
  - NEA and AFT state affiliate website reviews
  - Validated with administrative data from PA and IL

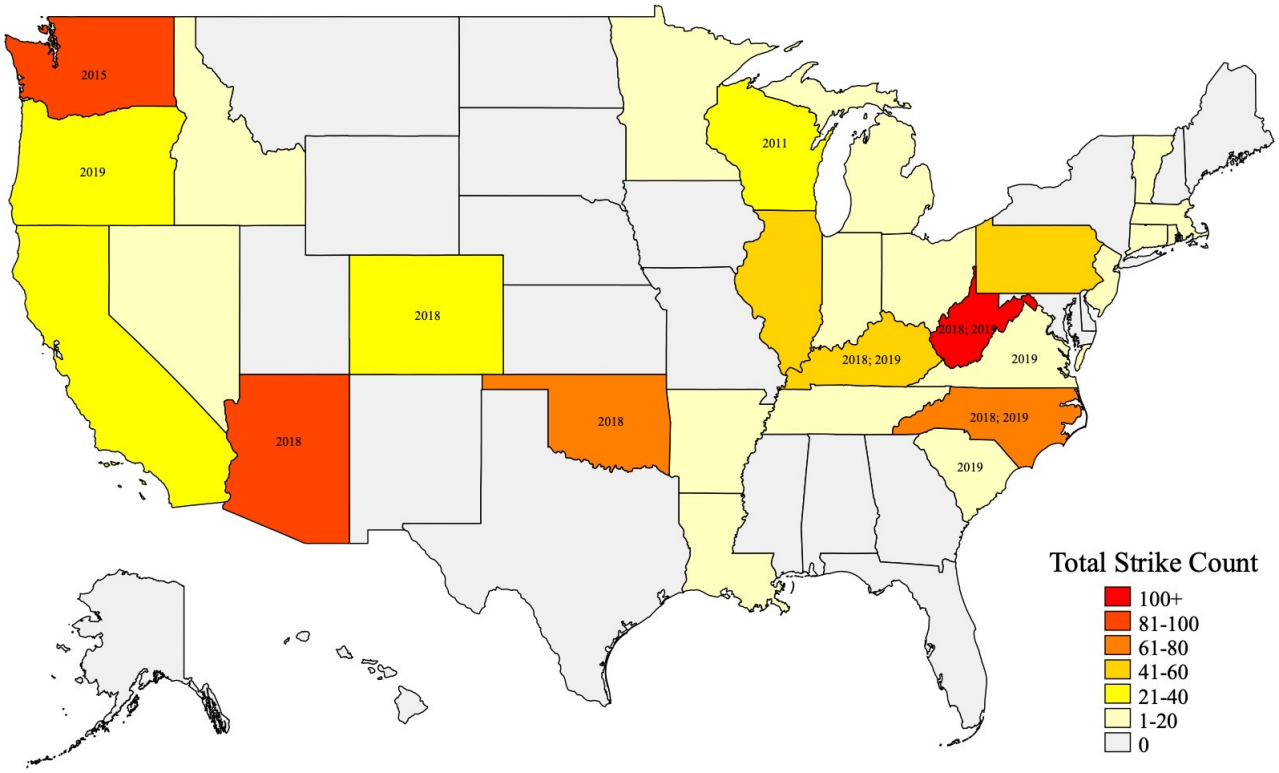
- **Merged with:**
  - Common Core of Data (CCD): compensation, working conditions
  - Stanford Education Data Archive (SEDA): achievement data

Teacher Strikes Tend to Be Short



- Median: 2 days
- Mean: 4.6 days
- Mode: 1 day
- 65% of strikes end w/in 5 days
- 90% of strikes are less than 10 days long

Where Do Strikes Occur?



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Overwhelmingly Motivated by Compensation

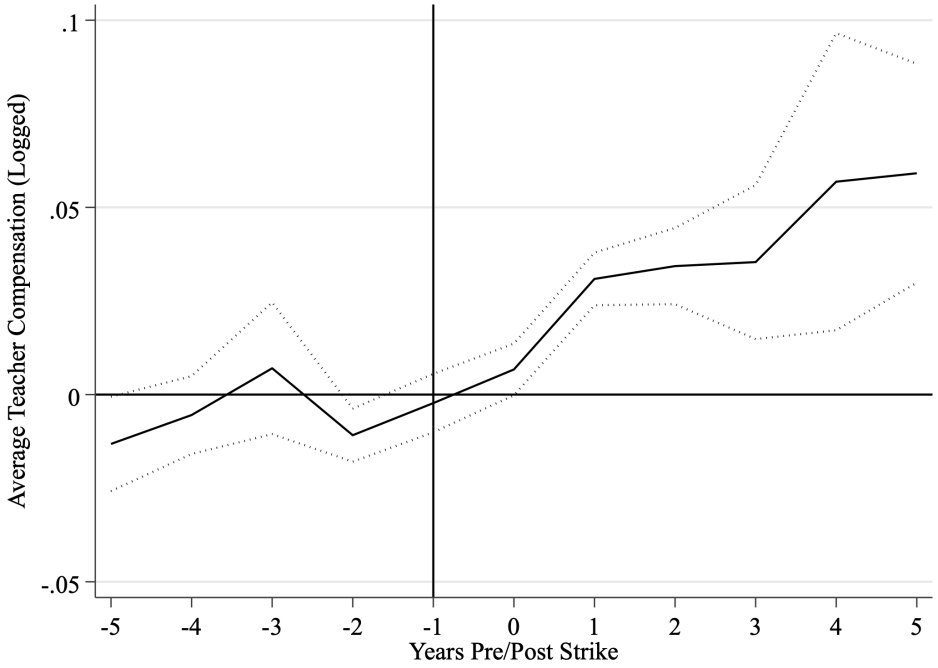
Reason	% of Strikes
Compensation	**89%**
Salaries	80%
Benefits	28%
Working Conditions	56%
School Expenditures	45%
Noninstructional Staff	17%
Common Good	11%

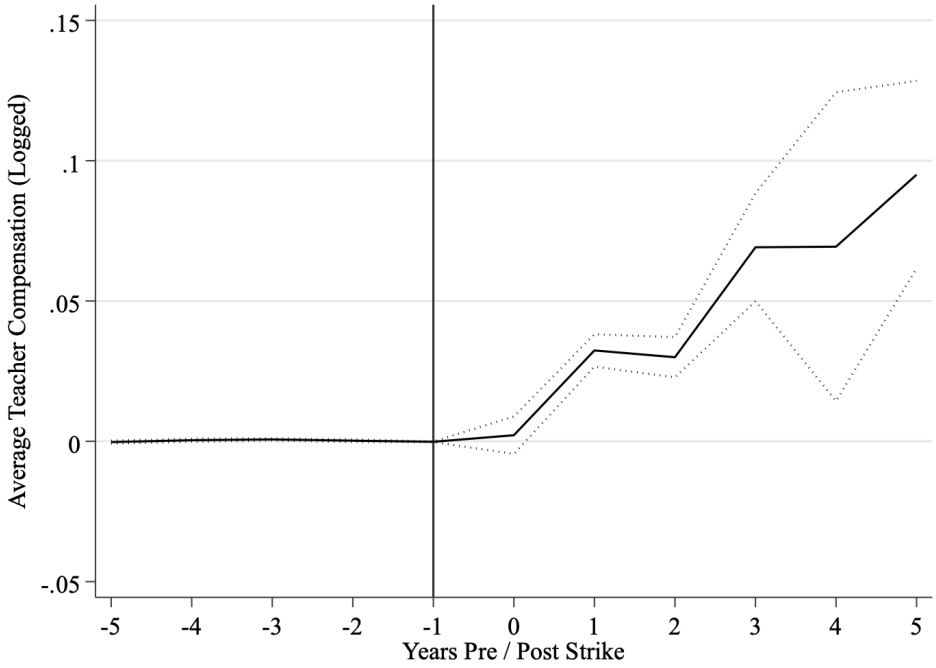
Empirical Strategy: Event Study

$$Y_{dt} = \sum_{r=-5}^{5} \beta_r \mathrm{I}(t - t_d^{strike} = r) + \lambda X_{dt} + \pi_d + \delta_t + \varepsilon_{dt},$$

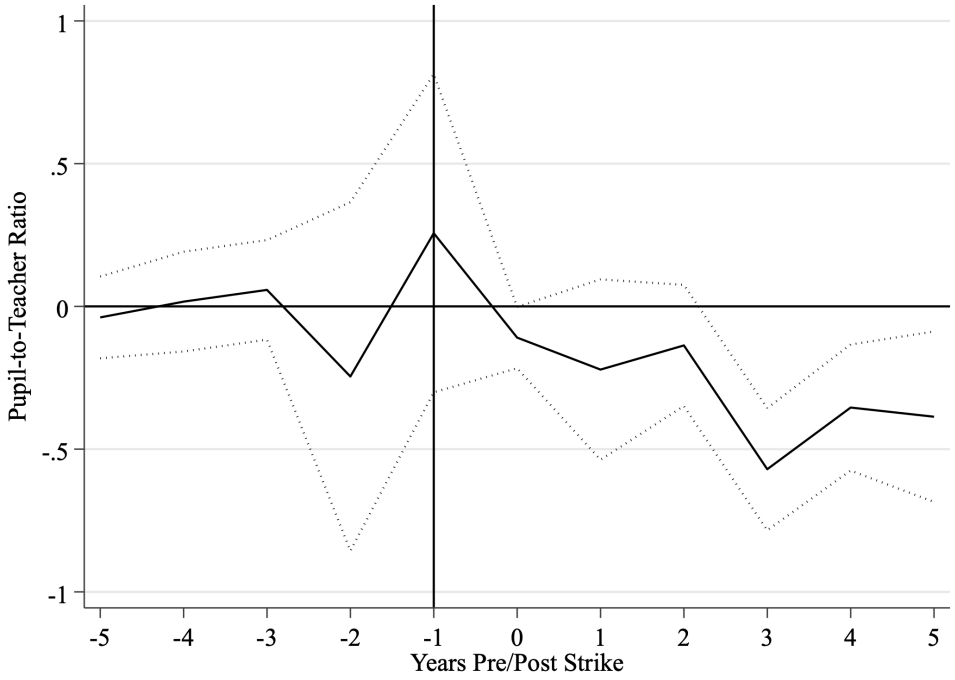
- d = school district
- t = school year
- t_d^{strike} = year of the first strike
- β_r = effect of the strike r years pre/post
- X_{dt} = covariates (pre-strike): student enrollment, unemployment rates, child poverty rates, and socioeconomic status
- Use Callaway & Sant'Anna (2020) estimator
- Also, synthetic DiD

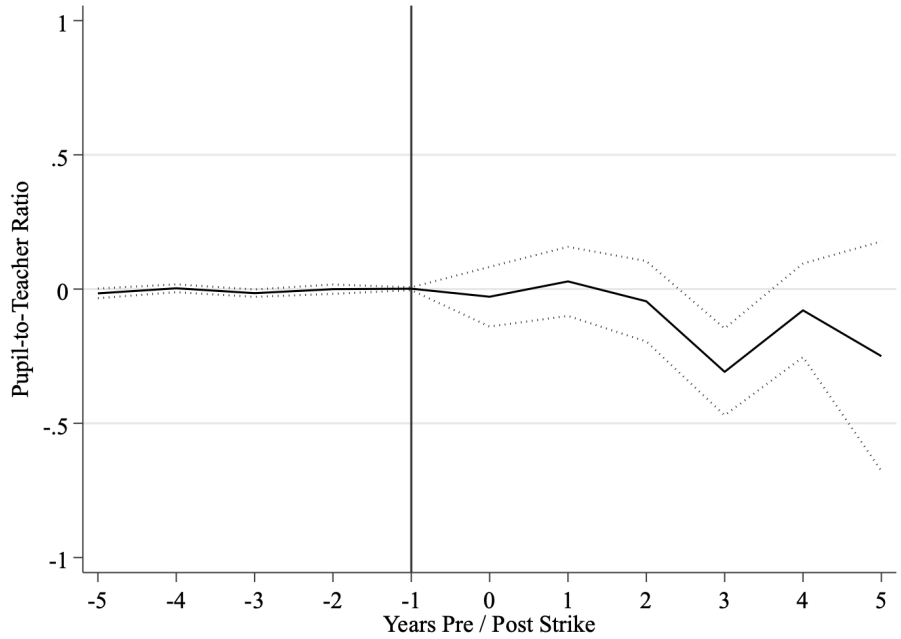
Strikes → +6% Annual Teacher Compensation ($7,629) by Year 5





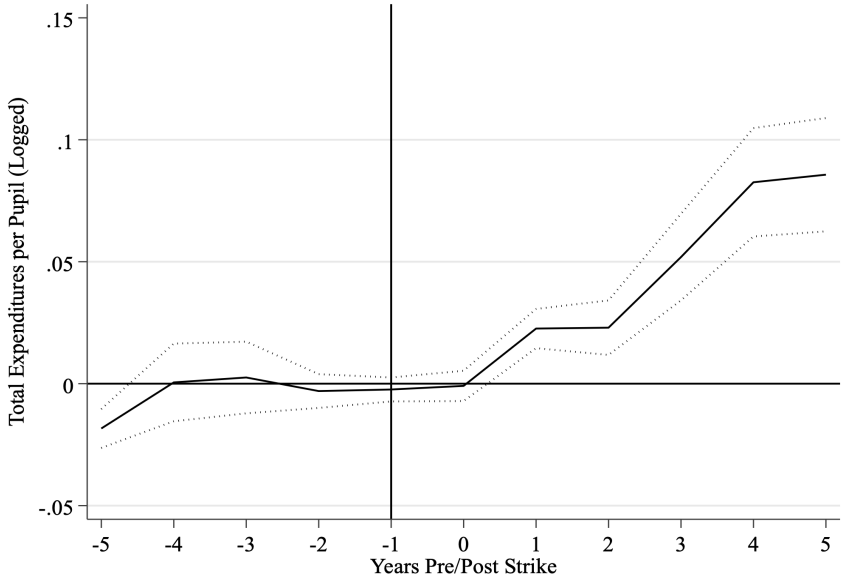
Strikes Decrease Pupil-teacher Ratios



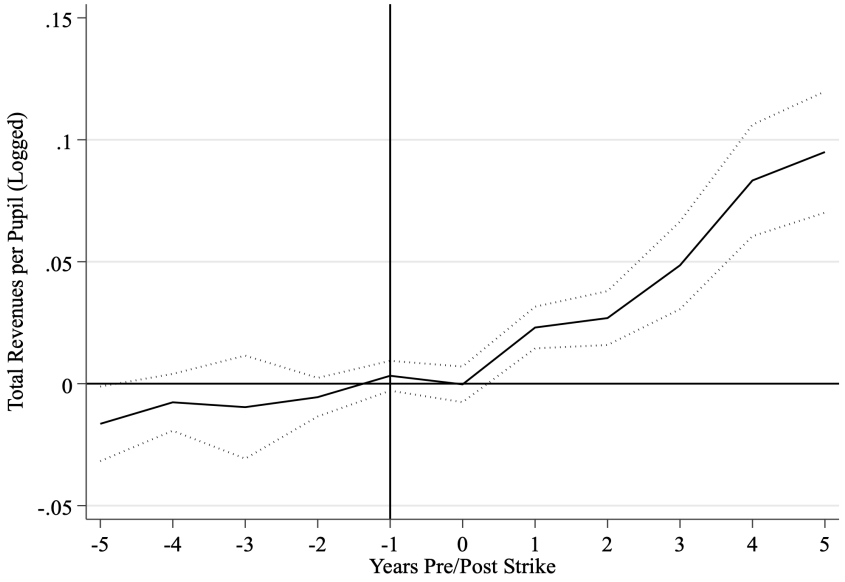


Money is From New Revenues, Not Reallocations

Expenditures per Pupil

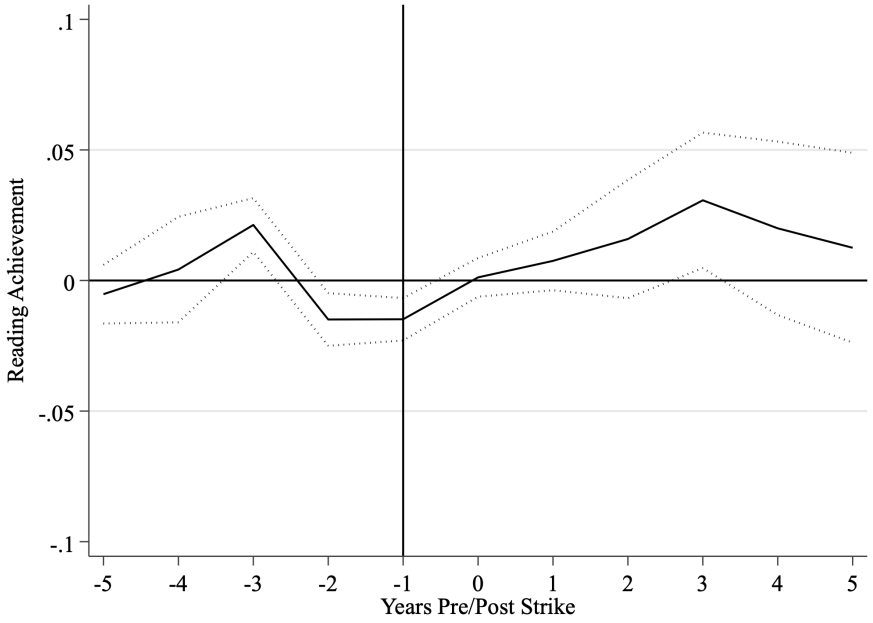


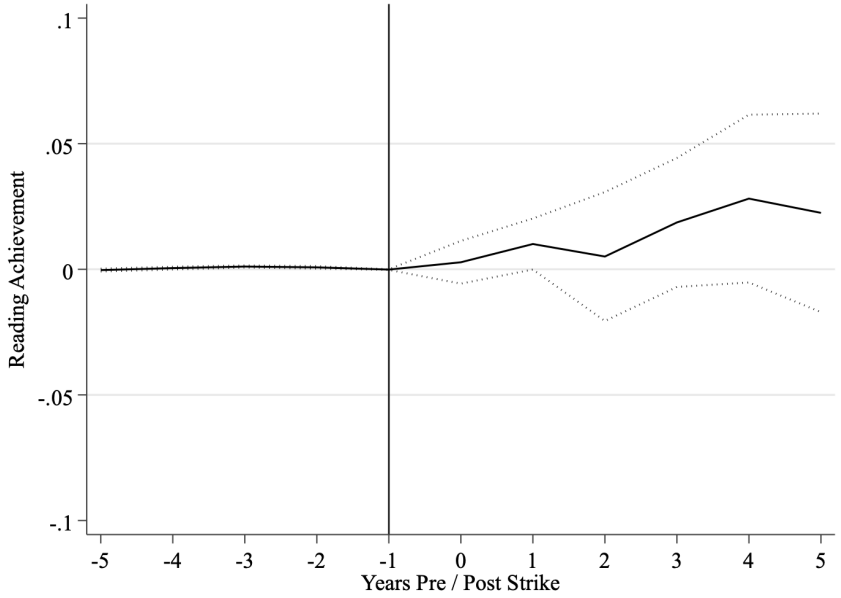
Revenues per Pupil



No Average Effect on Achievement

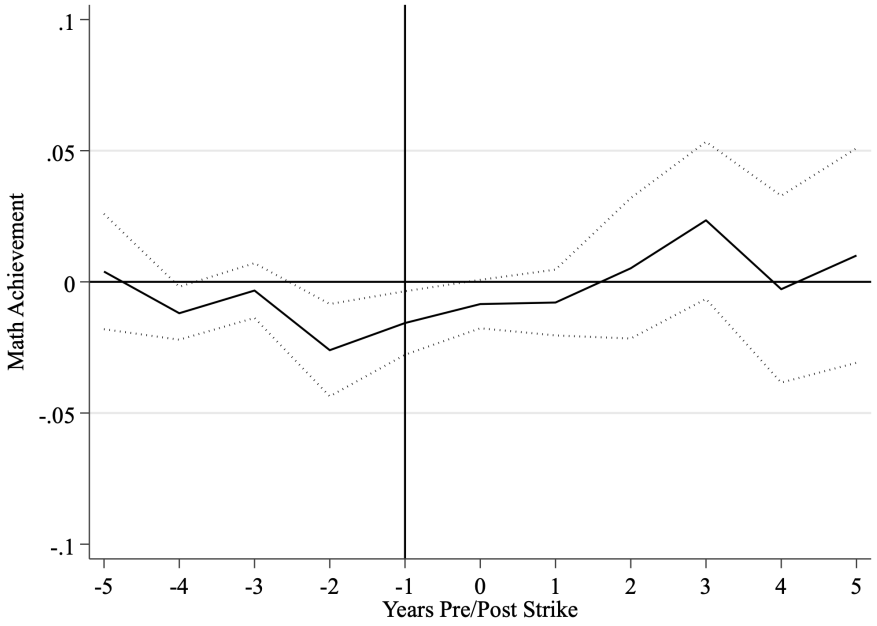
Reading

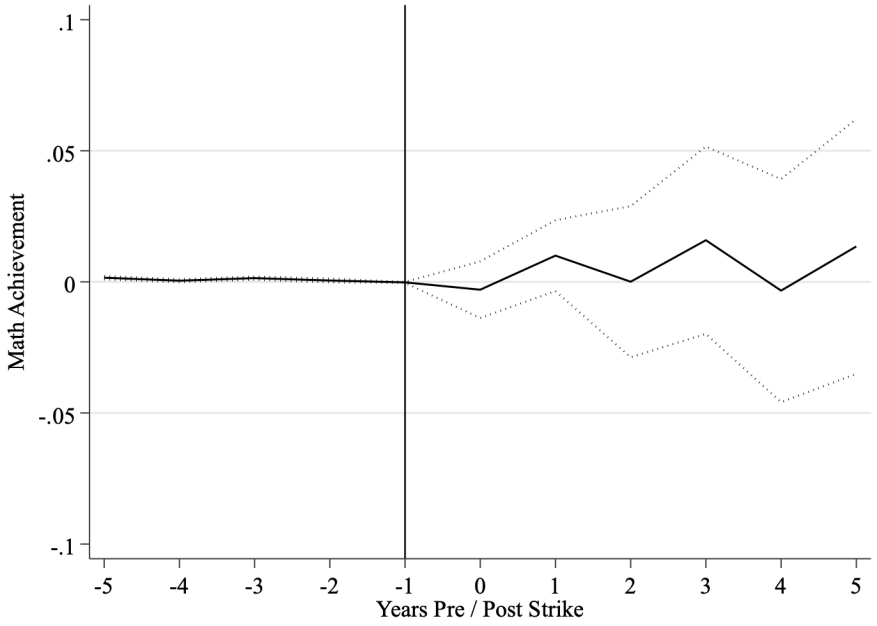




No Average Effect on Achievement

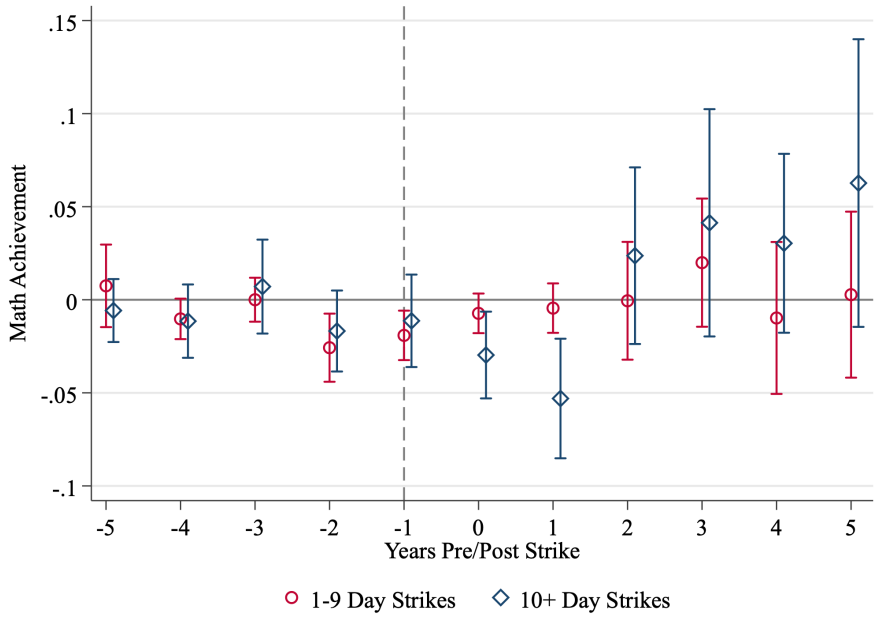
Math





Longer Strikes Negatively Affect Math Achievement in Years 0 and 1

Math



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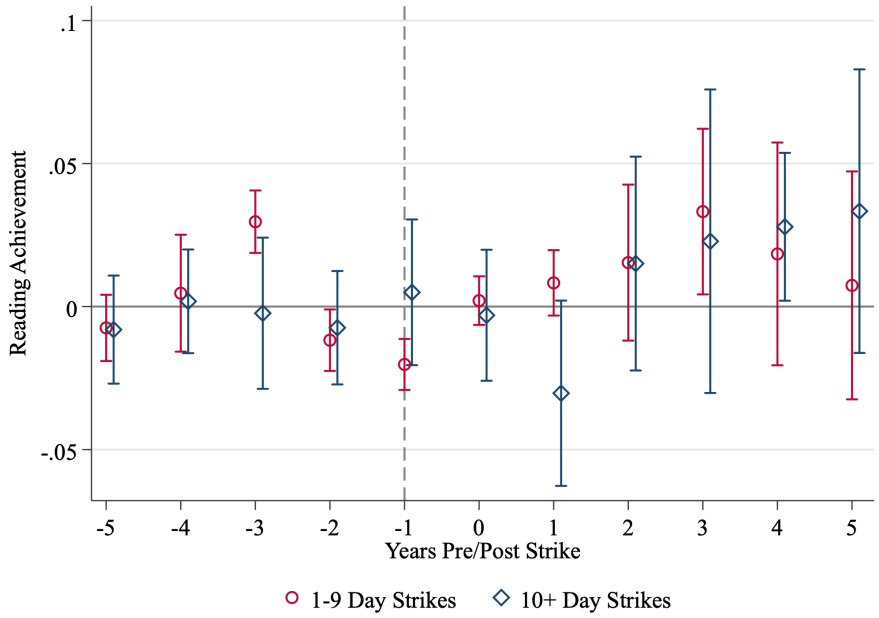
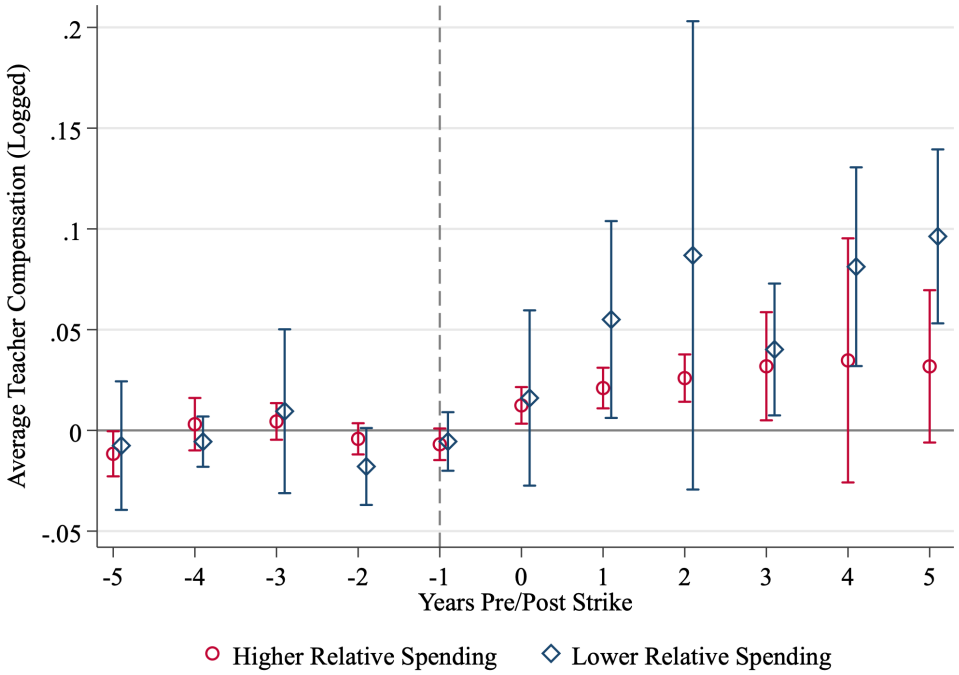
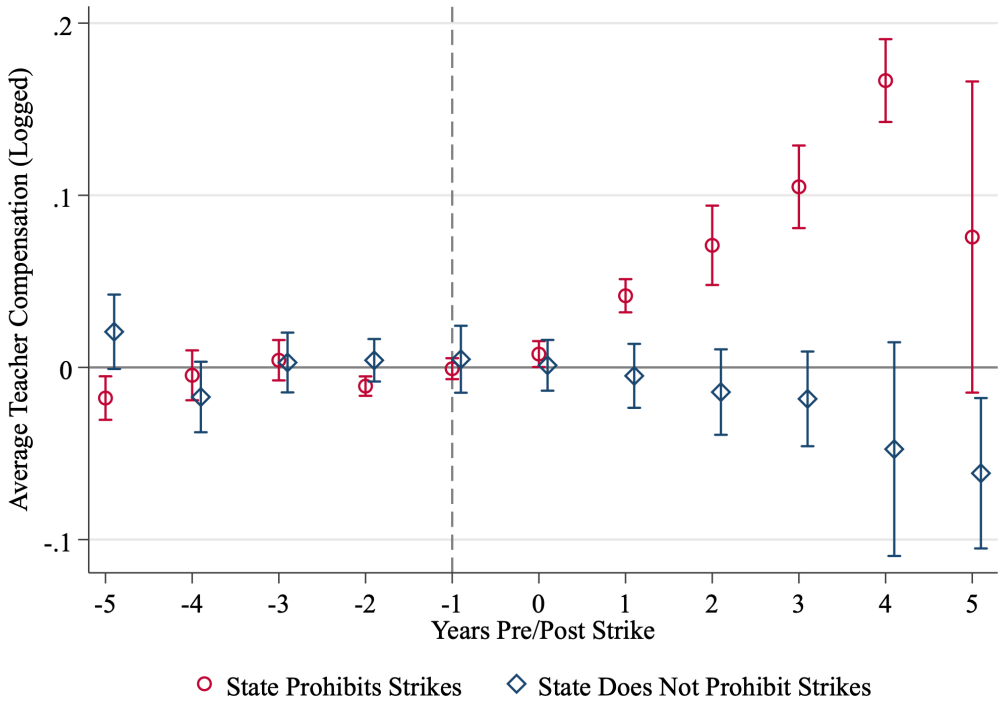


Strikes are Most Effective in Lower Spending Districts & Where They are Illegal





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Robustness

Alternative Comparison Groups:

- Synthetic DiD: Reweight based on pre-trends → larger effects
- Only non-striking states: Effects increase (suggests spillover)
- Only striking states: Effects attenuate but remain significant

Specification Checks (all robust):

- Adding sociodemographic controls (ELL, race, urbanicity)
- Removing all covariates
- Individual strikes only (excluding coordinated)
- Excluding Great Recession years (2006-2009)
- Excluding COVID-19 years (2020-2023)
- Dropping labor policy strikes (e.g., Wisconsin Act 10)
- Dropping high-strike years (2018-2019)
- Multiple events specification

Summary of Findings

- **Strikes are common and typically brief**
  - » 745 strikes (2007-2024); median 2 days; 89% for compensation
- **Large, sustained compensation increases**
  - » +6% ($7,629) by year 5; funded by new revenues
- **Improved working conditions**
  - » Smaller class sizes; more noninstructional staff
- **No average achievement effects**
  - » Null within 5 years; long strikes (≥10 days) harm math
- **Effectiveness varies by context**
  - » Larger effects: illegal strikes, low-spending districts

Contributions

- First causal study of US teacher strike efficacy in modern era
- Contrast to 1980s and 90s: strikes *do* raise wages in public sector
- Complements international evidence on long strikes (Baker 2013; Belot and Webbink 2010; Jaume and Willen 2019; Johnson 2011)

Policy Implications

- **Strike prohibitions often ineffective**
  - 71% of strikes occur where illegal
  - Penalties may matter more than legality
- **Policy changes could target long strikes**
  - Only strikes ≥10 days harm achievement
  - Consider graduated enforcement or compulsory mediation
- **Strikes as effective labor tactic**
  - Short strikes achieve compensation gains without harming students
  - Signal need for education investment to policymakers

Thank You!

mlyon@albany.edu

www.melissa-lyon.com

@mimiarnoldlyon.bsky.social

Session I: Evidence on Teacher Working Conditions: Daily Realities, Leadership, and Labor Action

Discussant

- **Marla Ucelli-Kashyap,** Senior Director for Educational Issues, American Federation of Teachers

Paper Presentations

- **To Make Teaching Sustainable, Help Teachers Balance Work and Personal Demands—Findings from the 2025 State of the American Teacher Survey**. Elizabeth Steiner, RAND, CALDER-R&R
- **Principal Effects on Teacher Working Conditions.** Cory Koedel, University of Missouri, CALDER-R&R
- **The Causes and Consequences of U.S. Teacher Strikes.** Melissa Arnold Lyon (Mimi), University at Albany SUNY, CALDER-R&R

Session II: Evidence on What Makes Teachers Stay: Schedules, Salaries, and School Leaders

Paper Presentations

- **Teacher Retention and the Four-Day School Week**. Andrew Camp, Brown University
- **Teacher Salary Raises and Teacher Turnover: Evidence from the Arkansas LEARNS Act.** Gema Zamarro, University of Arkansas, CALDER-R&R
- **Principals with Special Education Experience and Special Education Teacher Attrition.** Roddy Theobald, CALDER/AIR, SPARC

Discussant

- **Mark Olofson,** Executive Director of Education Data, Research, and Strategy at Texas Education Agency

The Effects of the Four-Day School Week on Teacher Recruitment and Retention

Andrew M. Camp, Brown University
J. Cameron Anglum, Lehigh University
Cory Koedel, University of Missouri
Se Woong Lee, University of Missouri
Tuan D. Nguyen, University of Missouri

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4DSW Calendars Have Become More Popular in Recent Years

Four-day school weeks (4DSWs) saw rapid growth post-COVID[1]

- 2019 - 1600 schools in 650 districts
- 2024 - 2100 schools in 850 districts

[1]Morton et al., 2024

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Four-day school weeks (4DSWs) saw rapid growth post-COVID[1]

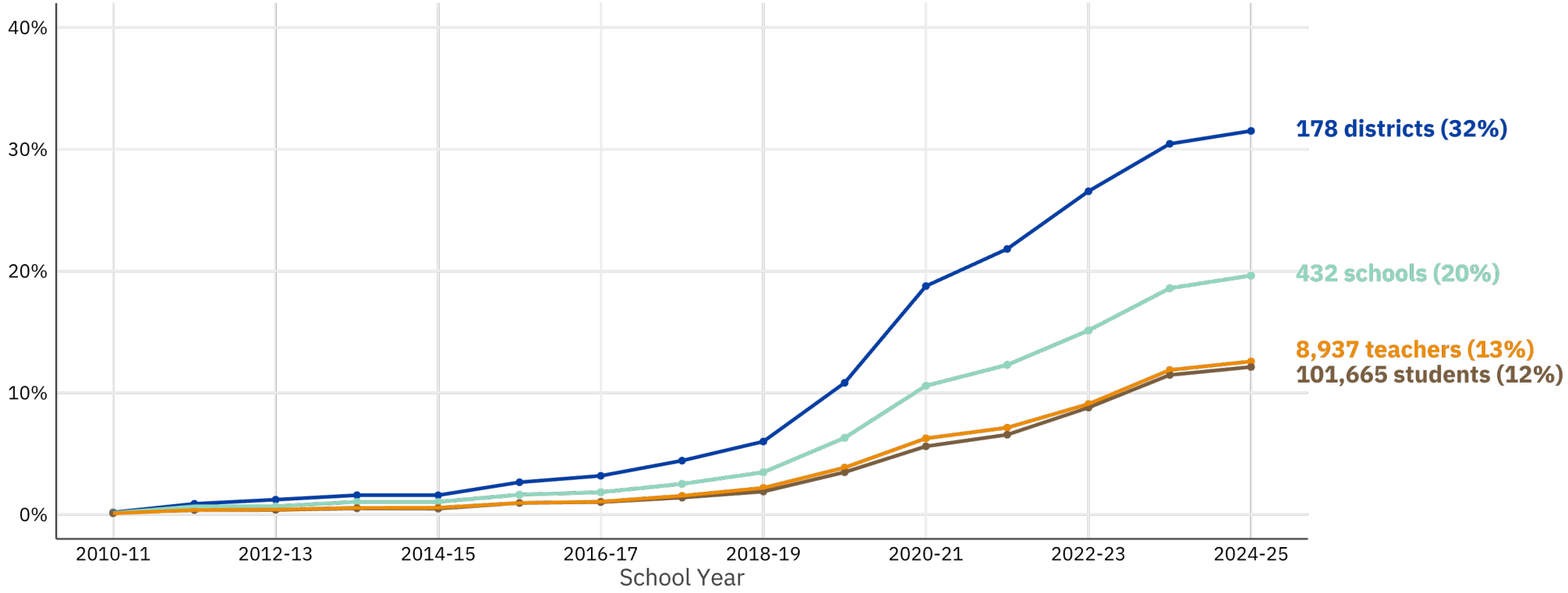
- 2019 - 1600 schools in 650 districts
- 2024 - 2100 schools in 850 districts

Adoption is widespread in several states

- Colorado[2] – 71%
- Oregon[3] – 40%
- Missouri[4] – 32%
- Arkansas[5] – 19%

[1]Morton et al., 2024; [2]Morton & Dewil, 2025; [3]Ainsworth et al., 2025; [4]Camp et al., 2025; [5]Camp, 2025

Missouri is a Compelling Setting to Study the Effects of the 4DSW



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Despite their Popularity, 4DSWs are Contentious

Prior research does not make a strong case for 4DSWs

- Cost savings are minimal[6]
- Effects on students' academic outcomes are largely null or negative[7]
- Community support in 4DSW districts is high[8]

[6]Thompson et al., 2021; [7]Morton et al., 2024; [8]Morton, 2025

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State policymakers are actively trying to dissuade 4DSW adoption

- Modest funding increases for MO districts on a 5DSW[9]
- Voter-approval required to adopt/maintain a 4DSW[9]

[6]Thompson et al., 2021; [7]Morton et al., 2024; [8]Morton, 2025; [9]Senate Bill 727 of 2024

We Investigate Districts' Motivations for 4DSW Adoption and Evaluate the Effect of 4DSWs on Retention & Recruitment

Why do districts adopt a 4DSW calendar?

- Semi-structured interviews with 36 Missouri educators in 22 4DSW districts
- Included early (2015-16) and more recent adopters (2021-22)

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- Semi-structured interviews with 36 Missouri educators in 22 4DSW districts
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Does the 4DSW help improve teacher retention or recruitment?

- Teacher job assignments from 2008-09 through 2023-24
- Difference-in-differences identification strategy

Teacher Retention and Recruitment Were Primary Motivators

"**We can't compete with salary**, so we had to put things in place like the four-day to encourage them to stay."

Teacher Retention and Recruitment Were Primary Motivators

"**We can't compete with salary**, so we had to put things in place like the four-day to encourage them to stay."

"We're very close to districts that pay a lot more and so we're naturally at a disadvantage when trying to recruit any kind of staff member…**The four-day week has become something that is pushed as a benefit**"

District Leaders Report a Need to “keep up with the Joneses”

“We’re surrounded [by four-day districts] and if you're a teacher, you know, **why would you pick us, right?**...I know that we have lost some teachers to the four-day school weeks.”

District Leaders Report a Need to "keep up with the Joneses"

"We're surrounded [by four-day districts] and if you're a teacher, you know, **why would you pick us, right?**...I know that we have lost some teachers to the four-day school weeks."

"It becomes **an expectation, or at least a norm, when you're trying to recruit teachers and you are competing for the same pool of people**…it makes it tricky when you're not also a four-day school week and you're small, so small, relatively rural."

Some Participants Were Skeptical About 4DSW Sustainability

"If it comes to pass that the 4DSW becomes so ubiquitous that everybody has [it], then **where are we going to be in rural America trying to recruit teachers?** Or, we're going to have to find exactly what we should be doing now, which is building on a climate and culture that is more inviting…That should be our rallying cry. Not, 'we will make you work for less, fewer days in the week.'"

We Examine Retention and Recruitment Using Individual-level Data

1.1 million teacher-by-year observations

- 2008-09 through 2023-24 school years
- Observe end-of-year turnover
- Subject area assignments and certification details

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1.1 million teacher-by-year observations

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Focus on comparisons with "not-yet-treated" districts

Identify 4DSW adoption using calendar data from MO DESE

Effects are Estimated Using a Two-stage DiD Estimator

Estimate a 1st stage regression using only not-yet-treated observations

$$Y_{ijt} = \alpha_0 + \theta_j + \delta_t + v_{ijt}$$

Effects are Estimated Using a Two-stage DiD Estimator

Estimate a 1st stage regression using only not-yet-treated observations

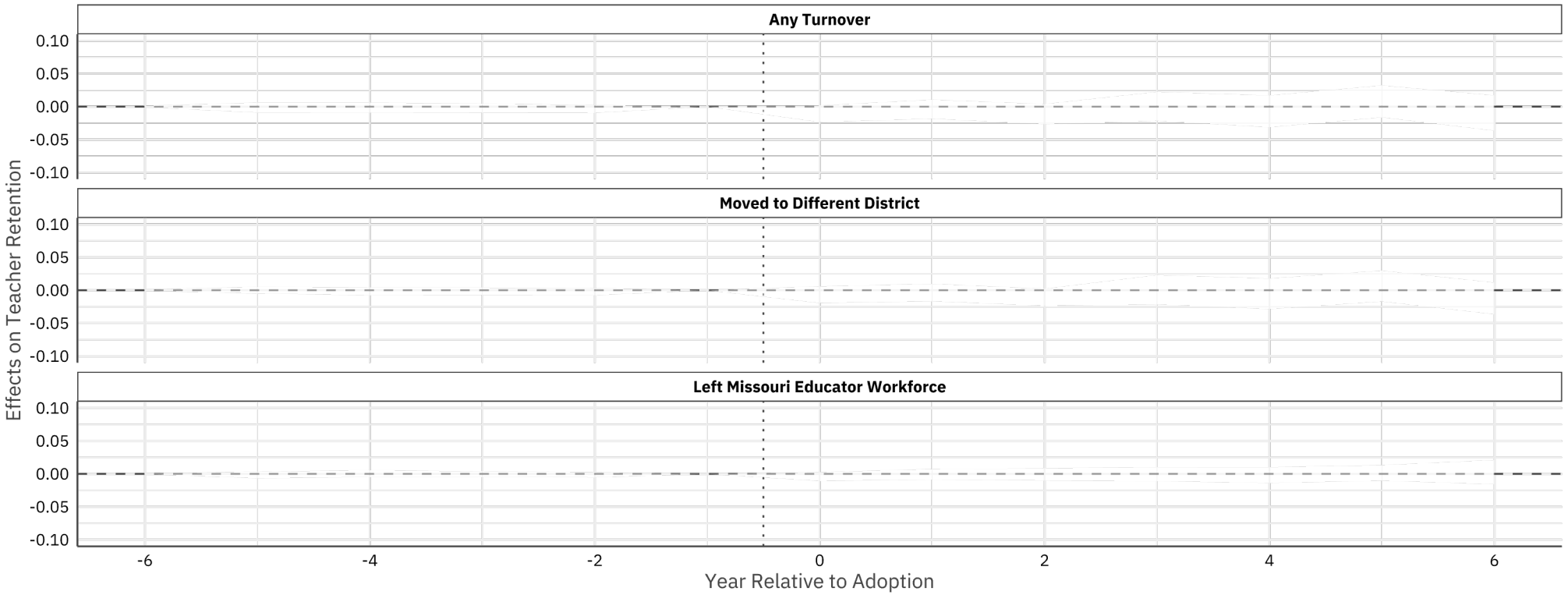
$$Y_{ijt} = \alpha_0 + \theta_j + \delta_t + v_{ijt}$$

Residualize outcomes and use as dependent variable in second stage

$$Y^*_{ijt} = Y_{ijt} - (\widehat{\alpha_0} + \widehat{\theta_j} + \widehat{\delta_t})$$

$$Y^*_{ijt} = \gamma_0 + 4\mathrm{DSW}_{\mathrm{jt}}\gamma_1 + \epsilon_{ijt}$$

We Consider Any Turnover As Well As Different Types of Turnover



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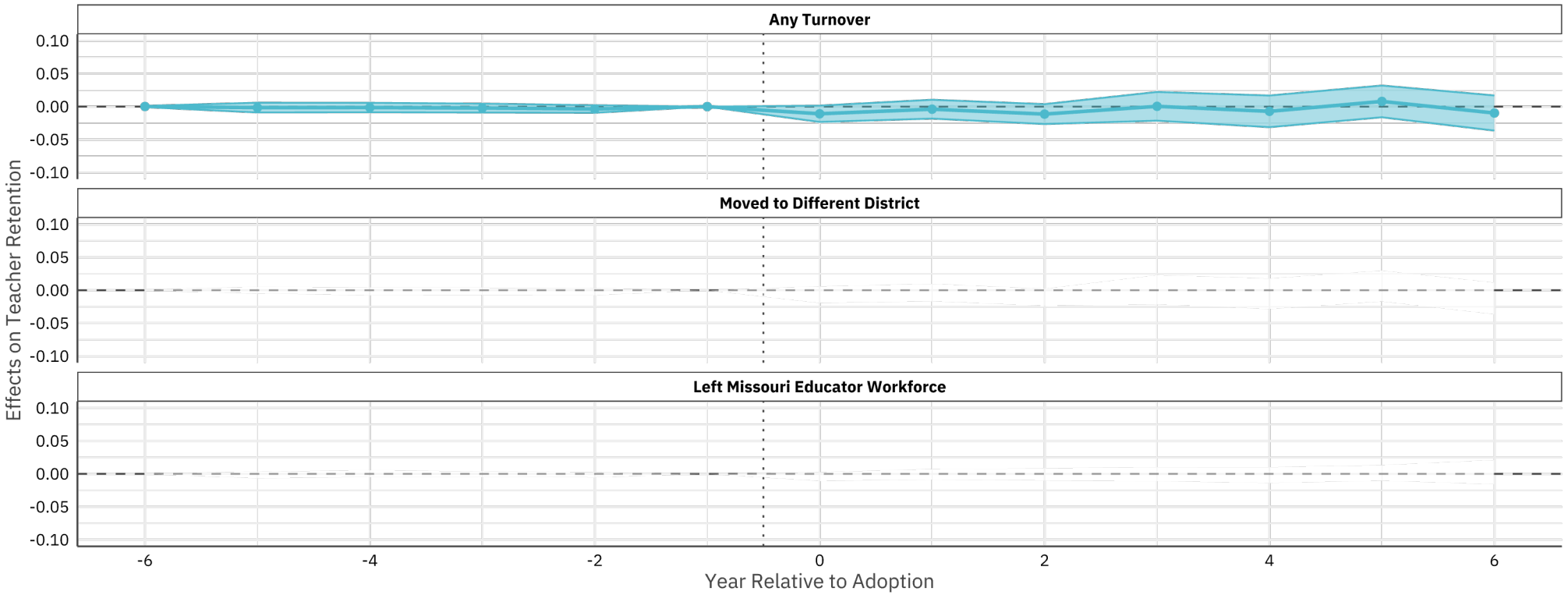
Our Results Indicate 4DSWs Do Not Impact Overall Turnover



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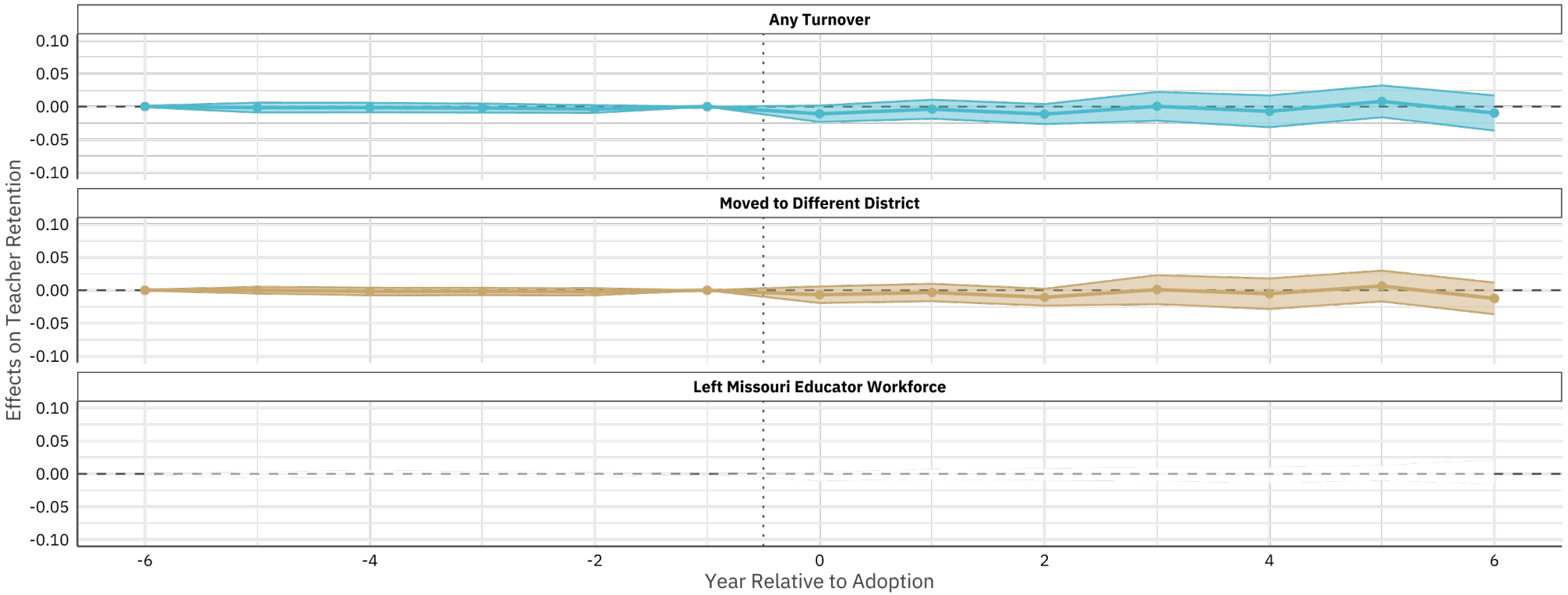
Our Results Indicate 4DSWs Do Not Impact Moving Districts



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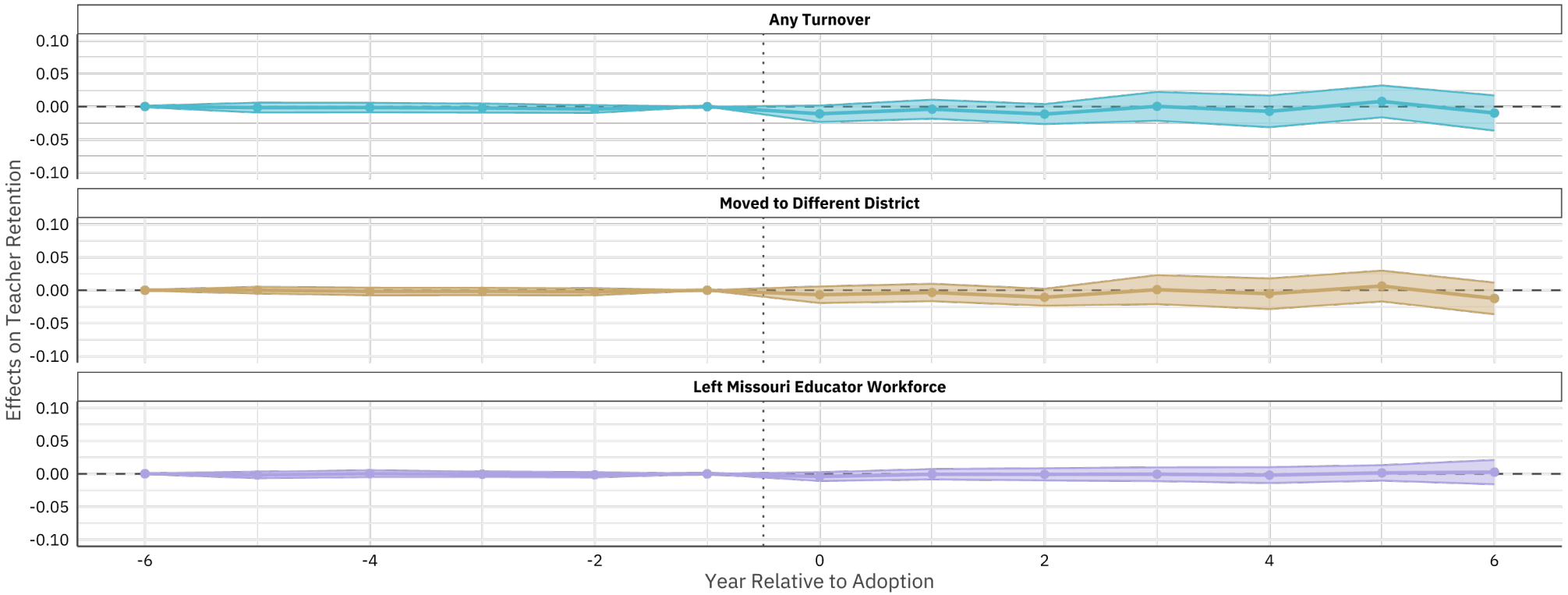
Our Results Indicate 4DSWs Do Not Impact Workforce Retention



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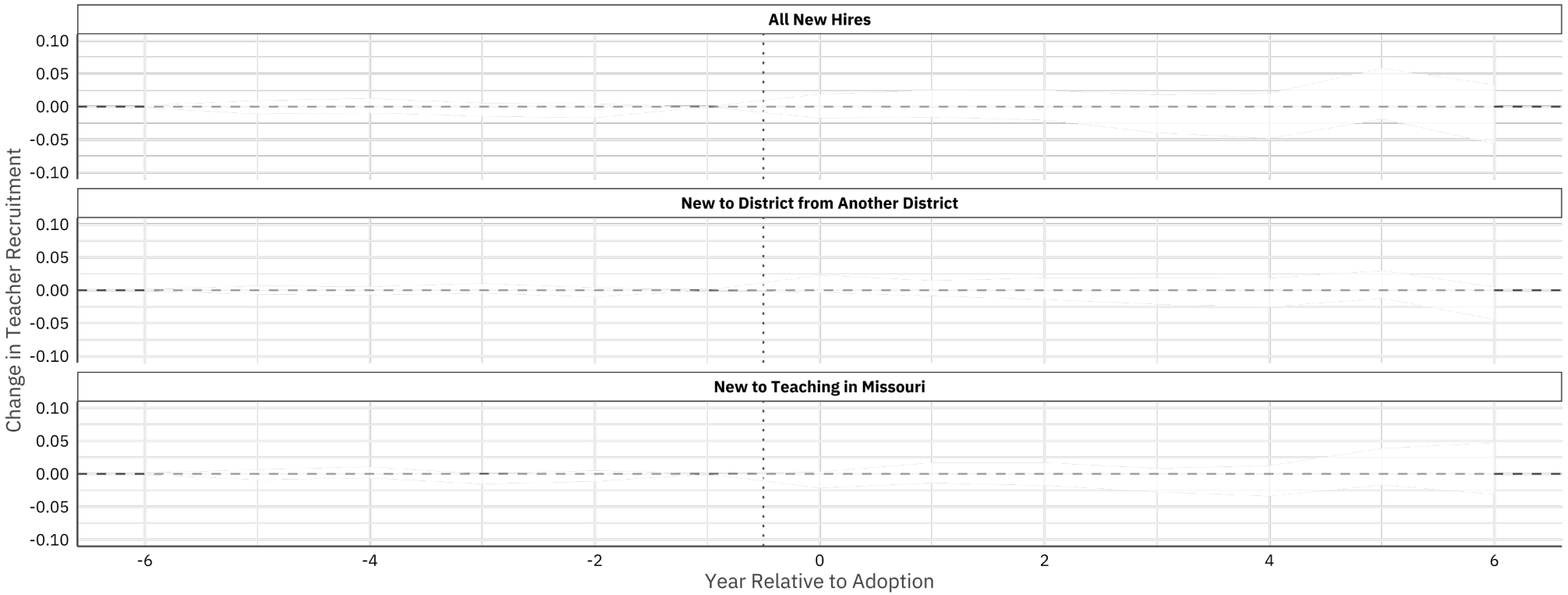
We Similarly Examine Different Types of Teacher Recruitment



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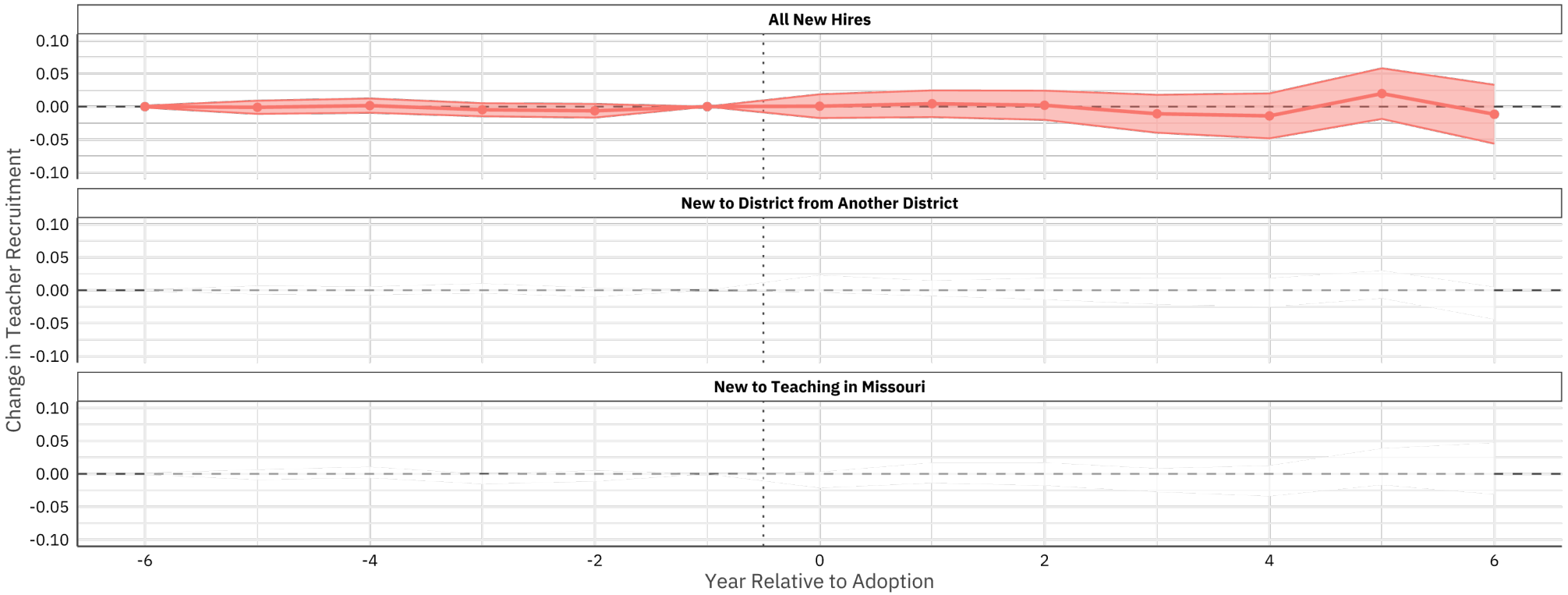
Our Results Indicate No Effect on the Number of New Hires



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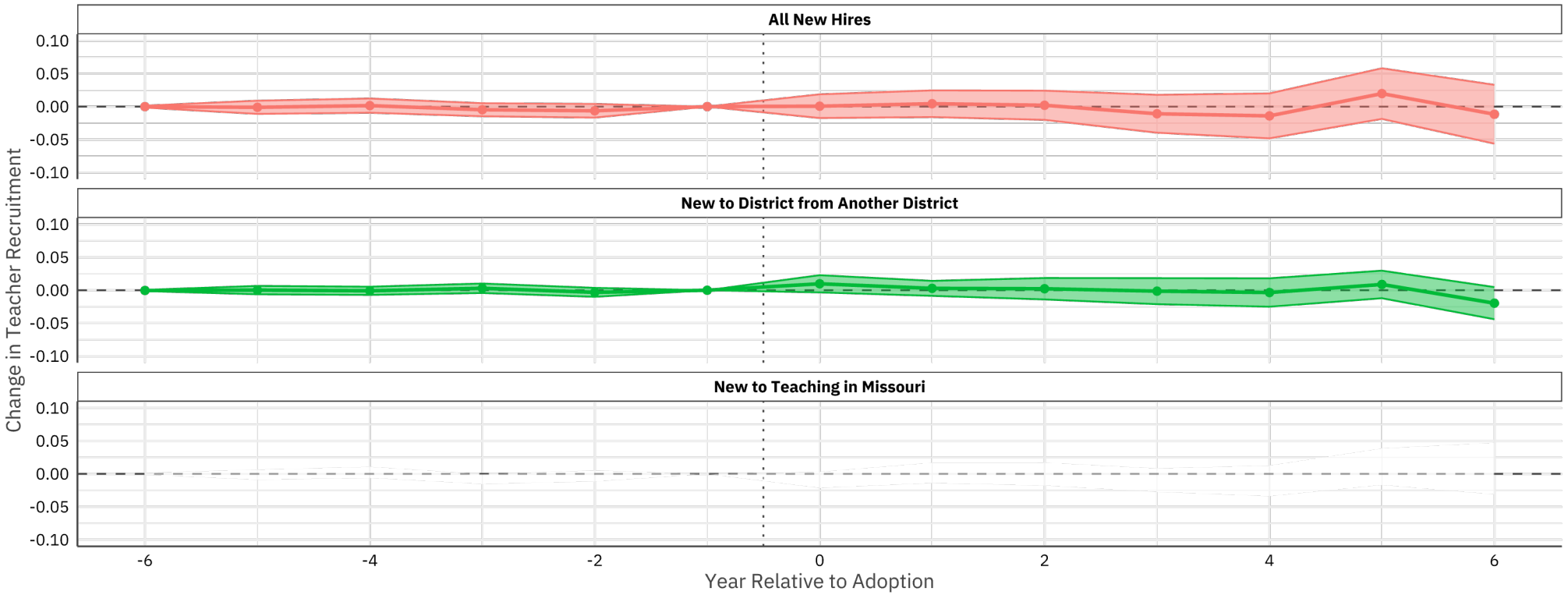
We Do Find a Small Positive Effect on Hires from Another District



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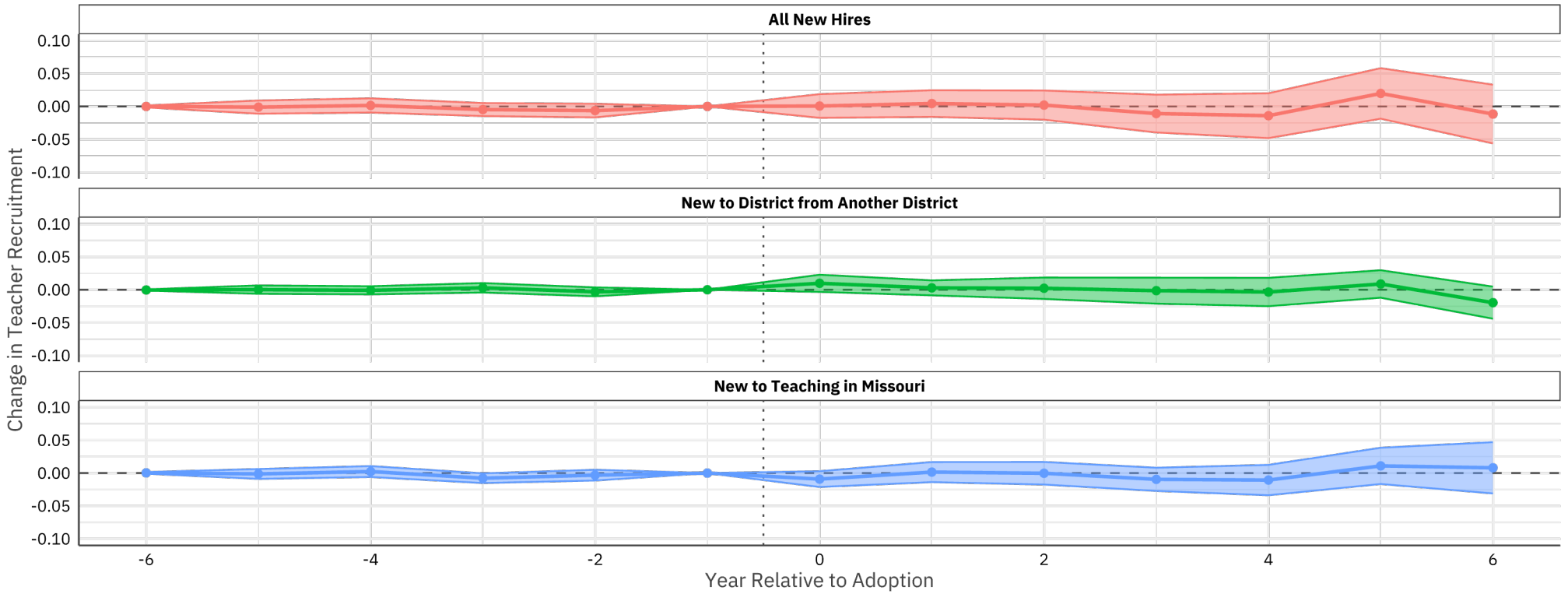
…with a Similar Small, Negative Effect on Hires of New Teachers



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These Findings are Robust to Many Alternative Specifications, Estimators, and Potential Effect Heterogeneity

Results are qualitatively similar when we

- Include never-treated or never-treated rural districts in comparison group
- Account for saturation effects, spatial spillovers, and heterogeneity by rurality
- Estimate effects on subject-specific subgroups (e.g., STEM/SPED teachers)
- Estimate effects only for interviewed districts
- Use other estimators (TWFE, CS, ETWFE, DiD Imputation) or include covariates
- Restrict to pre-COVID periods

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Results are also not explained by changes in enrollment, salary growth, etc.

The Results of our Quantitative and Qualitative Analyses Stand in Stark Contrast With Each Other

We find no meaningful effects on retention or recruitment

- Estimates of retention effects are near zero
- Recruitment estimates suggest *small* a substitution effect

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Why might educators' views differ from quantifiable events?

- Teachers might not value 4DSWs enough to affect retention
- District leaders lack a counterfactual for comparisons
- Confirmation bias among adopters

District Leaders Should be Cautious and Realistic About 4DSWs

We find no meaningful effects on retention or recruitment

4DSWs may have negative effects on students

- Effect sizes of -0.02 to -0.09 on students' academic outcomes
- Small effects may accumulate over time

Adopting a 4DSW calendar is not a panacea

- "…what we should be doing now, which is building on a climate and culture…"

Learn more in our CALDER working paper

The Effects of the Four-Day School Week on Teacher Recruitment and Retention

Andrew M. Camp
J. Cameron Anglum
Cory Koedel
Se Woong Lee
Tuan D. Nguyen

Teacher Salary Raises and Retention: Evidence from the First Three Years of the Arkansas LEARNS Act

Gema Zamarro, University of Arkansas
Andrew Camp, Brown University
Josh McGee, University of Arkansas
Taylor Wilson, University of Arkansas
Miranda Vernon, University of Arkansas

Note: The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305C240007 to American Institutes for Research. The opinions expressed are those of the authors and do not represent the views of the Institute or the U.S. Department of Education

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Increasing teacher base salaries could help teacher retention

- Concerns about the health of the teaching profession:
  - Average inflation-adjusted teacher salaries have stagnated over the past several decades (Kraft and Lyon, 2022)
  - Public school teachers' wages also appear lower or, at most, on par with those of other college graduates (Allegretto and Mishel, 2020; Taylor, 2008; Richwine and Biggs, 2011; West, 2014)
- Increasing teacher base salaries could help teacher retention:
  - **Hendricks (2014)** finds positive effects of increases in teachers' base pay on turnover outside the district using Texas data
  - **Sun et al. (2024)** employ legislative funding changes in Washington state and find that increases in certified base teacher salaries, particularly for more senior teachers, helped teacher retention

Arkansas traditionally used a minimum salary schedule for teachers

- Between 2004-05 and 2022-23:
  - Required increments for years of experience
  - Legislature set minimum base salaries and increments
  - Districts were free to go beyond these minimums
- Modest growth in minimum teacher compensation during this period:
  - New teacher, bachelor's degree:
    - 2004-05: **$27,500**
    - 2022-23: **$36,000**
- Inflation outpaced minimum salary growth

The Arkansas LEARNS Act of 2023 contained substantial reforms to teacher compensation

- Increased the state's minimum teacher salary from $36,000 to $50,000
- Provided a minimum raise of $2,000 for all teachers making more than $48,000 during the 2022-23 school year
- Eliminated the minimum salary schedule
  - Increments for education and years of experience are no longer required
- New required spending fully provided by the state ~$183 million in new education spending

Research Questions

1. How have Arkansas school districts' teacher compensation policies changed in response to the LEARNS Act?

2. How have the relationships between teacher salaries and district characteristics changed?

3. How have teachers' salary raises induced by the LEARNS Act impacted teacher retention?

District level data

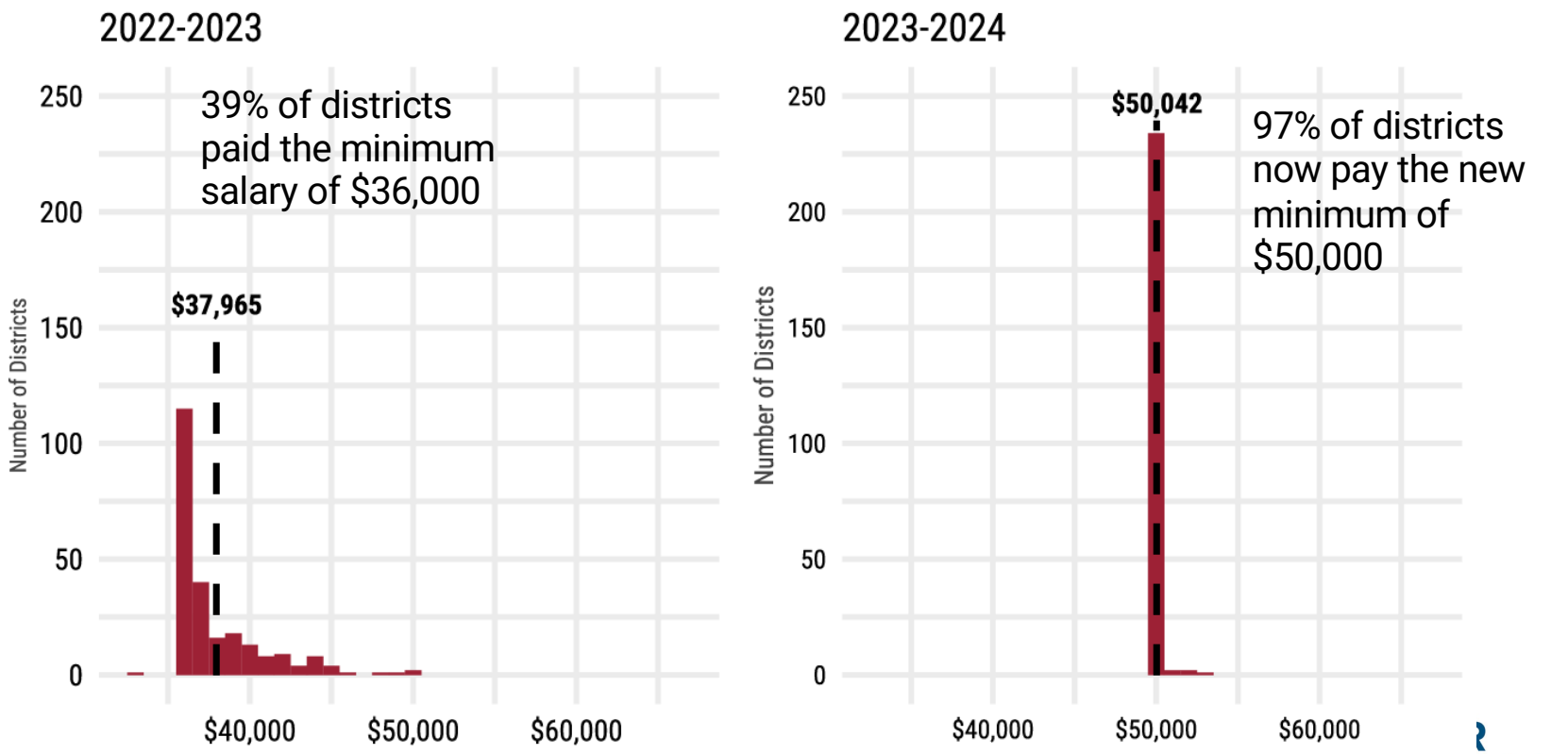
- We collected districts' salary schedules for the year before the LEARNS Act implementation (2022-23) and the first school year of implementation (2023-24)

- We have complete data for both years for:
  - 230 out of 234 traditional public school districts
  - 9 out of 12 of the charter schools that were present in both years and were subject to the law

- Other district characteristics from the Arkansas Department of Education data system and the National Center for Education Statistics Common Core of Data

How have Arkansas school districts adjusted their teacher compensation policies?

Distribution of Entry-Level Teacher Salaries - Bachelor's Degree



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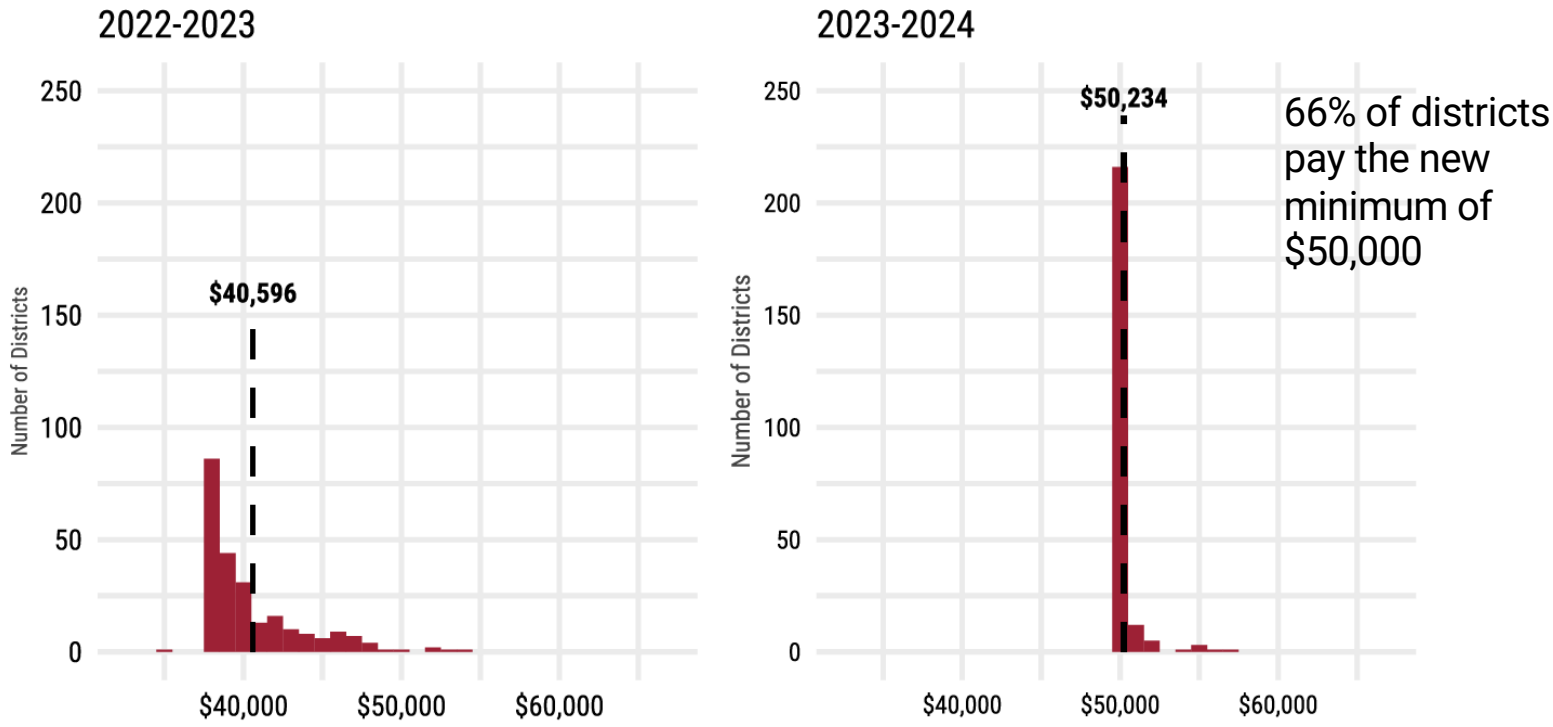
How have Arkansas school districts adjusted their teacher compensation policies?

Distribution Teacher Salaries - Bachelor's Degree & 15 Years of Experience



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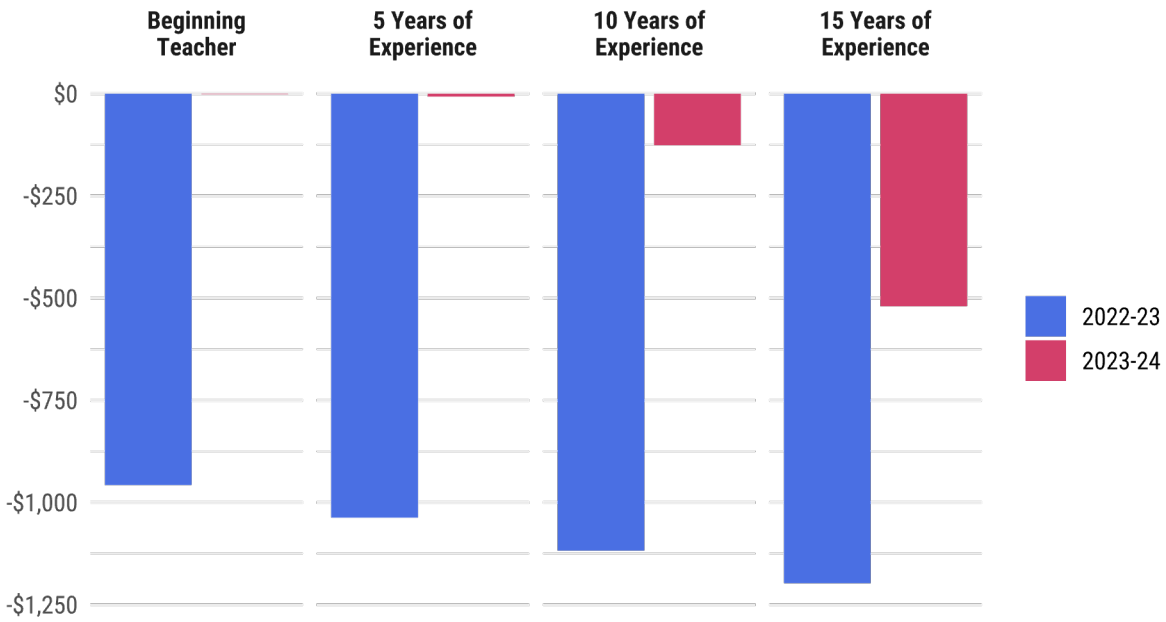
Districts responded to the LEARNS Act in three general ways

- If the 2022-23 schedule was entirely below $50,000, districts transitioned to flat $50,000 salary schedules (55% of BA schedules)
- Districts with some 2022-23 steps below $48,000 raised those steps to $50,000 and increased other steps by $2,000 (36% of BA schedules)
- Districts with all 2022-23 steps at/above $48,000 raised all steps by $2,000 (9% of BA schedules)

LEARNS represents a substantial increase in funding for rural and high-poverty districts, helping increase their competitiveness

- The LEARNS Act significantly reduced the observed negative and significant association between starting teacher salaries and higher rates of district poverty
- However, this association re-emerges among teachers with higher levels of experience

Estimated Relationship Between Teacher Salaries (BA) and Increased Childhood Poverty (10pp)



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Teacher level data

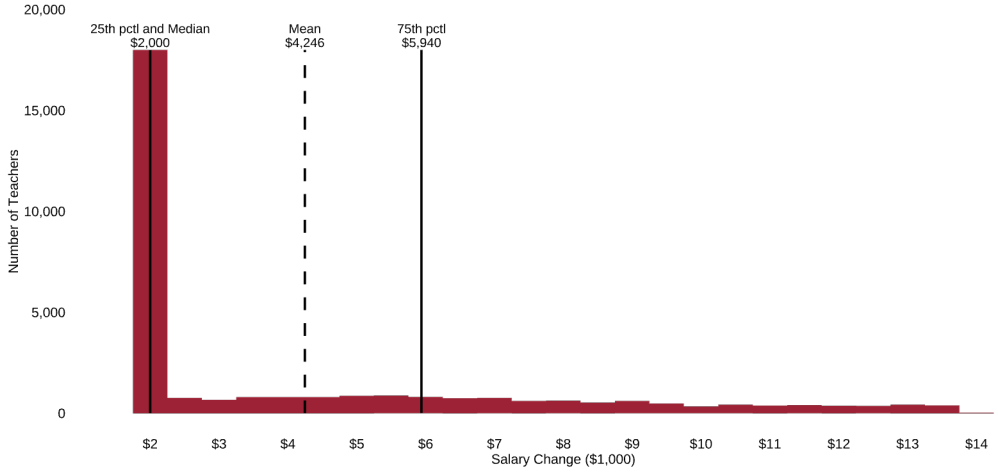
- Employment administrative data from the Arkansas Department of Education that covers the universe of traditional public and charter school teachers from 2014-15 to 2025-26

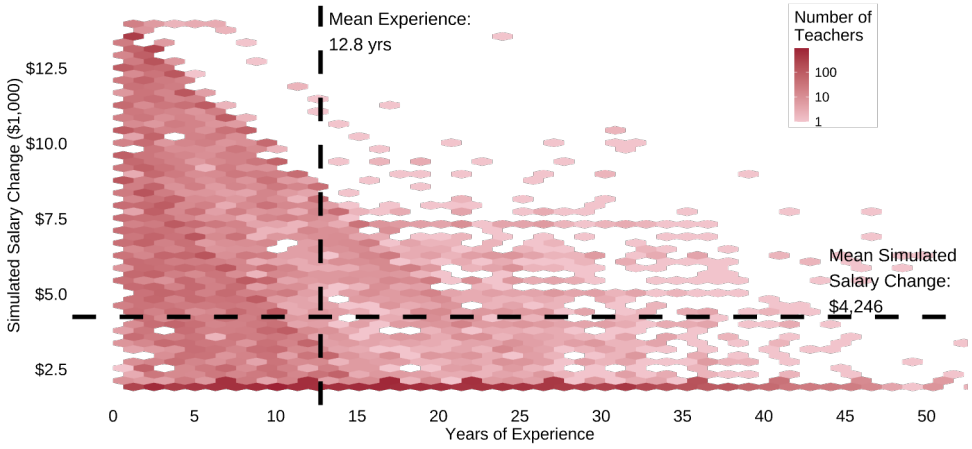
- Using data on job assignments in October, we consider 5 possible employment decisions from one year to the next:
  - **Stayers:** Remain in the same district from one year to the next
  - **Movers:** Change schools across districts
  - **Switcher:** Leave teaching for a non-instructional role
  - **Retirees**
  - **Exiters:** Leave the Arkansas public education workforce but do not appear as retired

Simulated teachers' salary changes as a result of the LEARNS Act

- We construct a simulated salary variable representing the raise ($1,000s) a teacher at a step (experience)/lane (education level) position *s* in district *d* would need to satisfy the new minimum salary:

$$R_{ids} = \frac{\max\left(\$50{,}000 - Salary_{ids}^{pre}, \$2{,}000\right) - \$2{,}000}{\$1{,}000}$$





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Empirical approach: Triple Difference-in-Differences

- We follow Ortiz-Villavicencio and Sant'Anna (2025) and develop a triple difference-in-differences specification:

$$Y_{idst} = \alpha_0 + (T_d \times R_{ids} \times Post_t)\alpha_1 + \gamma_{\mathrm{ds}} + \delta_{st} + \zeta_t(T_d) + \upsilon_{idst}$$

- Y_{idst} denote a binary labor transition outcome (exits, retirements, switches, and district moves, using stayers in the district as comparison)
- T_d is an indicator equal to one if district *d* is a treated district, i.e., a district containing at least some teachers whose required raise exceeds $2,000
- R_{ids} denotes a teachers' simulated salary change
- $Post_t$ is an indicator equal to one for years after the introduction of the LEARNS Act
- γ_{ds} are district-by-step/lane fixed effects
- δ_{st} are year-by-step/lane fixed effects
- $\zeta_t(T_d)$ are treated-district-by-year fixed effects

Estimation approach

$$Y_{idst} = \alpha_0 + (T_d \times R_{ids} \times Post_t)\alpha_1 + \gamma_{\text{ds}} + \delta_{st} + \zeta_t(T_d) + \upsilon_{idst}$$

- We estimate effects under three specifications of the treatment variable:
  - **Continuous Treatment** (R_{ids})
  - **Binary Indicator** for teachers receiving any raise of excess of \$2,000 ($R_{ds} > 0$)
    - Callaway et al. (2024) shows estimates would capture the ATT across all dose values
  - **Discretized Treatment:** \$2001-\$4000, \$4001-\$6000, \$6001-\$8000, and \$8001 or more

- To address potential dynamic treatment effects, we use Garner et al. (2024)'s two-stage differences in differences estimator

Estimated effects of LEARNS salary raises on teacher turnover

Panel A: Effect of LEARNS Raise (any amount over $2,000)

	Stayer	Mover	Switcher	Exiter	Retiree
Effect of Any Raise	0.019**	-0.006	-0.002	-0.009*	-0.007**
	(0.005)	(0.004)	(0.001)	(0.004)	(0.003)
Observations	371,876	331,439	322,140	329,458	323,640

Panel B: Effect of LEARNS Raise (per $1,000)

	Stayer	Mover	Switcher	Exiter	Retiree
Effect per $1,000	0.004**	-0.002*	-0.000	-0.002*	-0.001**
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
Observations	371,876	331,439	322,140	329,458	323,640

*** refers to p-value < 0.01; * refers to p-value < 0.05; + refers to p-value < 0.10*

Estimated effects of LEARNS salary raises on teacher turnover

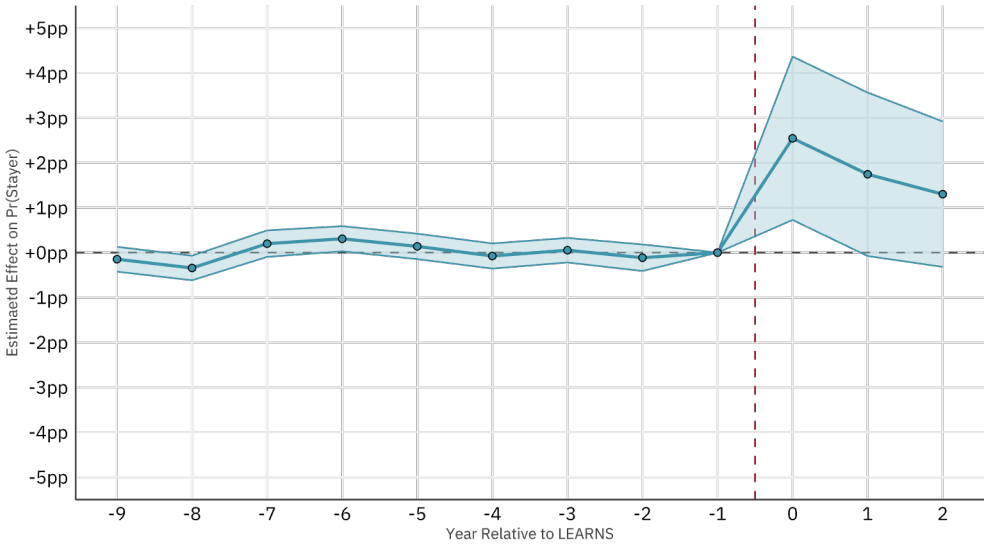
Panel C: Effect of LEARNS Raise (Binned)

	Stayer	Mover	Switcher	Exiter	Retiree
Raise: $2,001-4,000	0.002	0.004	-0.000	-0.003	-0.003
	(0.006)	(0.004)	(0.002)	(0.004)	(0.003)
Raise: $4,001-6,000	0.014*	-0.002	-0.002	-0.005	-0.008*
	(0.006)	(0.005)	(0.002)	(0.005)	(0.003)
Raise: $6,001-8,000	0.022**	-0.009+	-0.002	-0.009+	-0.009*
	(0.007)	(0.005)	(0.002)	(0.005)	(0.004)
Raise: > $8,000	0.031**	-0.014+	-0.002	-0.015*	-0.009*
	(0.008)	(0.007)	(0.002)	(0.007)	(0.004)
Observations	372,033	331,555	322,225	329,577	323,736

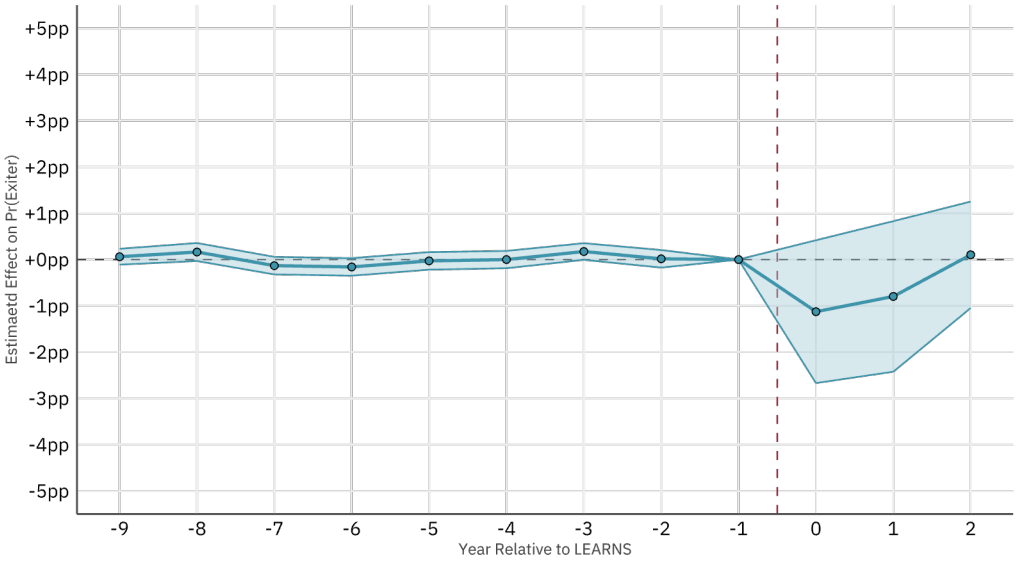
*** refers to p-value < 0.01; * refers to p-value < 0.05; + refers to p-value < 0.10*

Event studies estimates- Binary treatment

Stayers



Exiters



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Conclusions

- The LEARNS Act has substantially altered Arkansas Teacher Compensation, resulting in significant across-the-board salary raises for teachers
- Our estimates indicate positive effects of LEARNS-induced salary increases on teacher retention, with reductions in teacher exits, retirements, and moves outside the districts
  - Results align with survey data of superintendents and principals (Zamarro et al. (2024) and Schellhase et al., 2025)
  - The positive effects appear more concentrated on teachers who received the larger salary increases (+$6,000). Only larger increases might have the desirable results
- Policy makers and school districts should consider the potential continuation of these positive effects without further changes to their salary schedules

Thank you!

gzamarro@uark.edu

Principals' Special Education Experience and Special Education Teacher Retention

Roddy Theobald, Liz Bettini, Alli Gilmour, Anna McDonald, and LaRon Scott

The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R324C240002 to American Institutes for Research. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

Pre-Registration

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SPARC
The Special Educator Workforce:
A Research Collaborative

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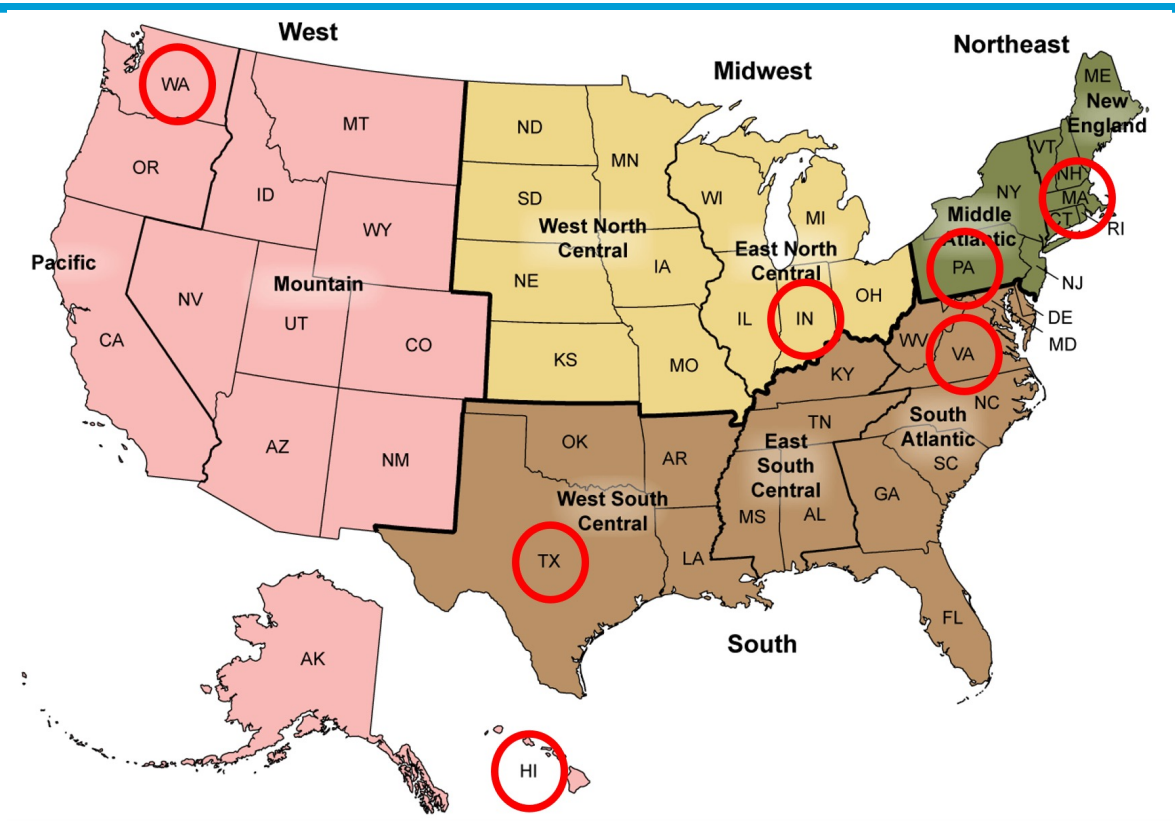
IES NCSER Funded National Research Center
The Special Educator Workforce: A Research Collaborative (SPARC Center)

Center Overview

The SPARC Center aims to address challenges related to the special education teacher (SET) workforce, including composition, distribution, stability, and effectiveness. It is a five-year $5 million IES NCSER grant covering research in partnership with seven states (Hawai`i, Indiana, Massachusetts, Pennsylvania, Texas, Virginia, and Washington).

See: www.sparccenter.org



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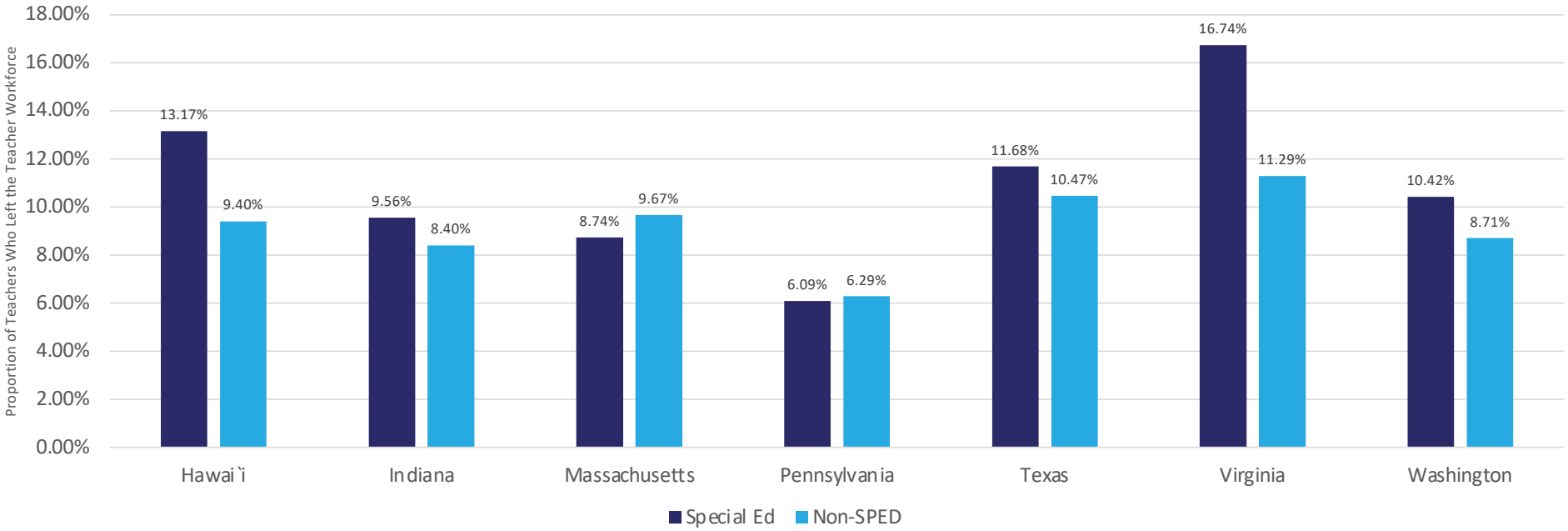
Just-In-Time Research Development with Washington

- May 2025: Initial presentation of SPARC Center findings to Washington CEEDAR team



Source. Gilmour, A., Bartanen, B., Bettini, L., Feng, L., Klinenberg, J., Mason-Williams, L., Redding, C., Scott, L., & Theobald, R. (2025). The composition, distribution, and stability of the special education teacher workforce in seven states. SPARC Center Working Paper 01-1025.

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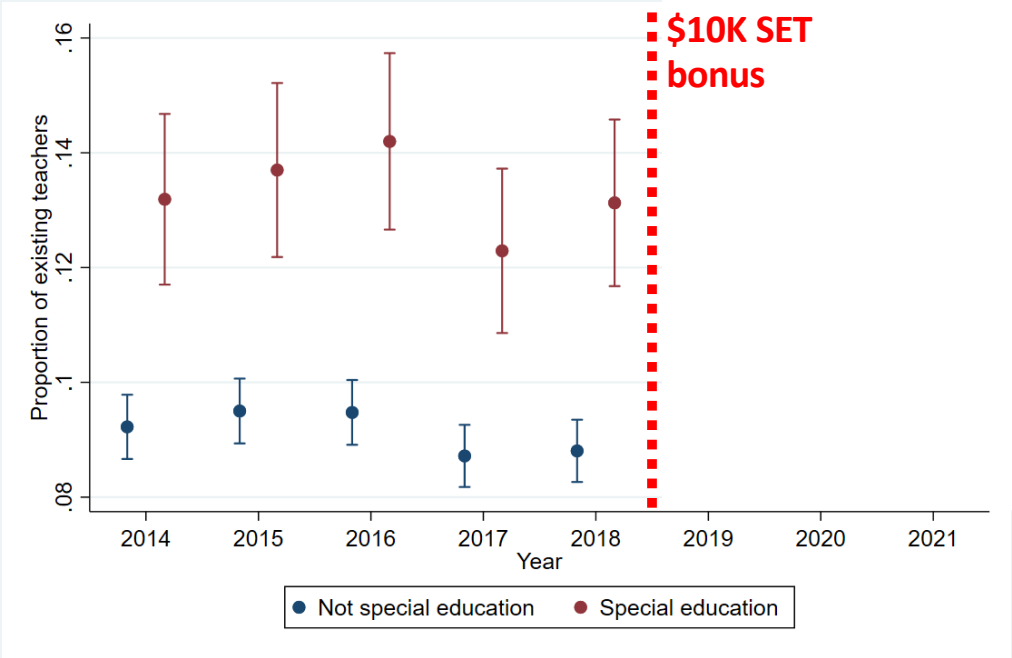

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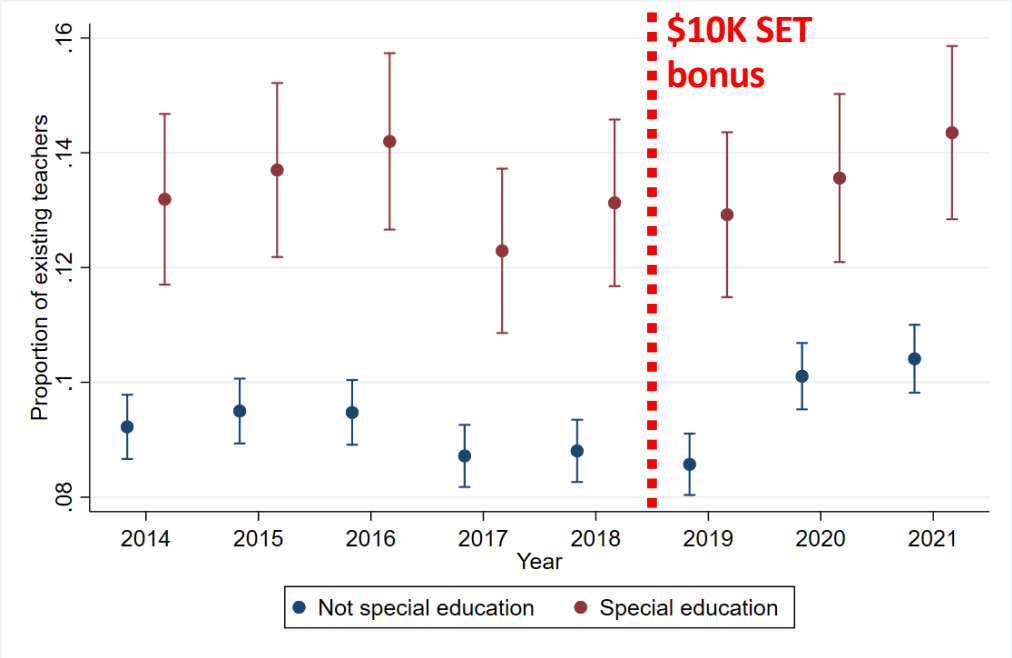

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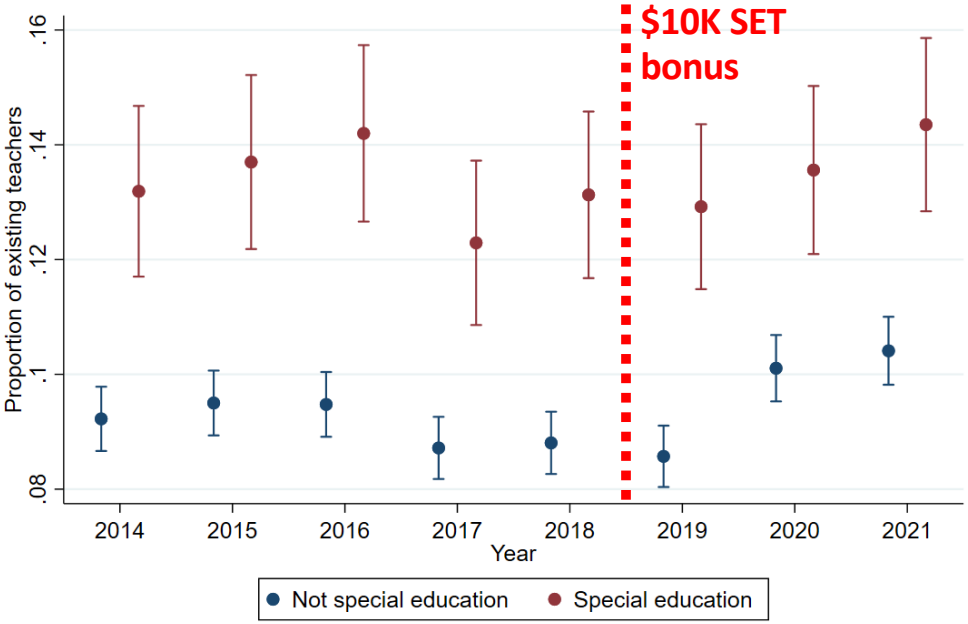

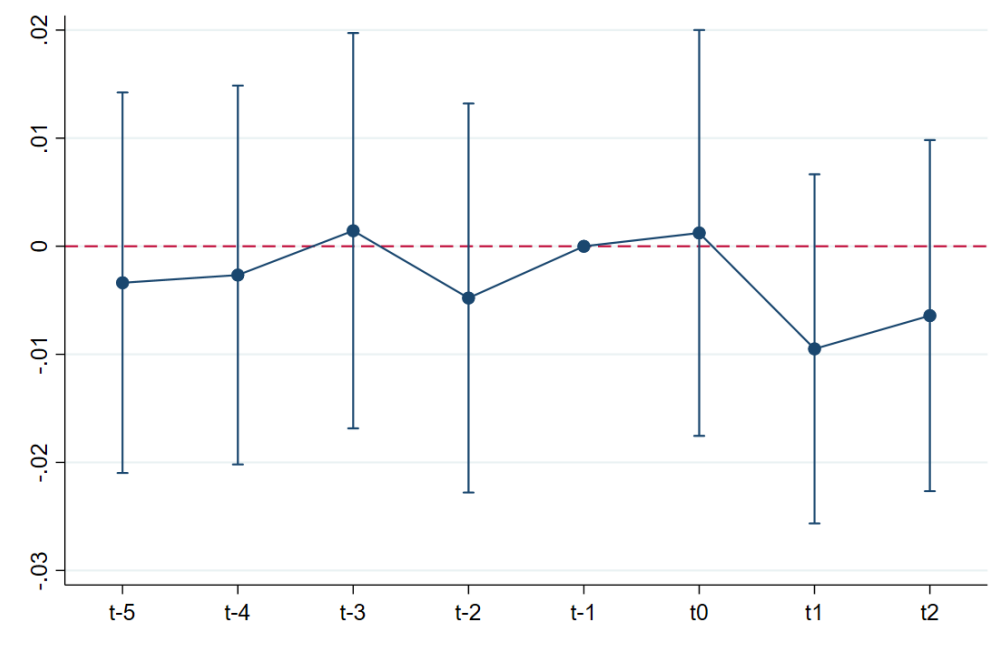

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Predictors of SET Retention

Review of Educational Research
October 2019, Vol. 89, No. 5, pp. 697–744
DOI: 10.3102/0034654319862495
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Special Education Teacher Attrition and Retention: A Review of the Literature

Bonnie Billingsley
Virginia Polytechnic Institute and State University

Elizabeth Bettini
Boston University

*Institutions of higher education should focus on **preparing leaders to support all teachers and students**. Special educators may have differential access to support in schools (Jones et al., 2013) as **principals**… may see special educators' work as falling outside their area of expertise or responsibility.* (pp. 735-736)

SETs as Principals

Empirical Research

HAMMILL INSTITUTE ON DISABILITIES

Exploring the Mobility of Special Education Teachers into School Principal Positions

The Journal of Special Education
1–11

DOI: 10.1177/00224669251364825
journalofspecialeducation.sagepub.com
Sage

LaRon A. Scott, EdD[1] and Andrew Wojcik, PhD[2]

*Only **9.07% of SETs obtained leadership endorsements qualifying them for principal roles**… the low percentage highlights a critical issue concerning the availability of school administrators with formal, specialized special education higher education training that can support the needs of students with disabilities and SETs in schools. This extreme gap is also troubling with regard to SET attrition, given recent research connecting SET retention with building-level administrators with special education compliance knowledge.* (p. 6)

Washington Just-In-Time Analysis: Research Questions

1) Are SETs more or less likely than other teachers to transition into school principal positions?

2) What percent of school principals have prior experience in special education in recent years?

3) Are SETs more likely to stay in their positions when their principal has prior experience in special education?

Recent (Since Pre-Registration) Work from Texas

Article

Principals' Special Education Experience: Implications for Special Education Teacher Turnover

Teacher Education and Special Education
1–23

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DOI: 10.1177/08884064251403416
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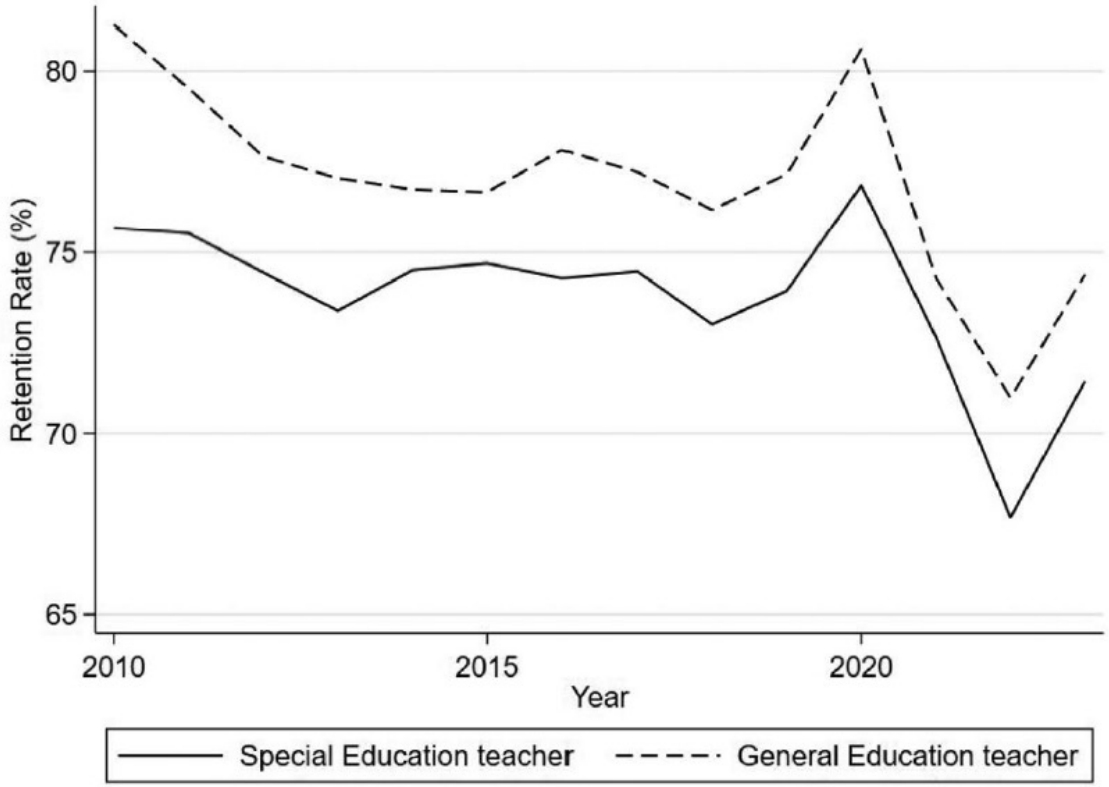
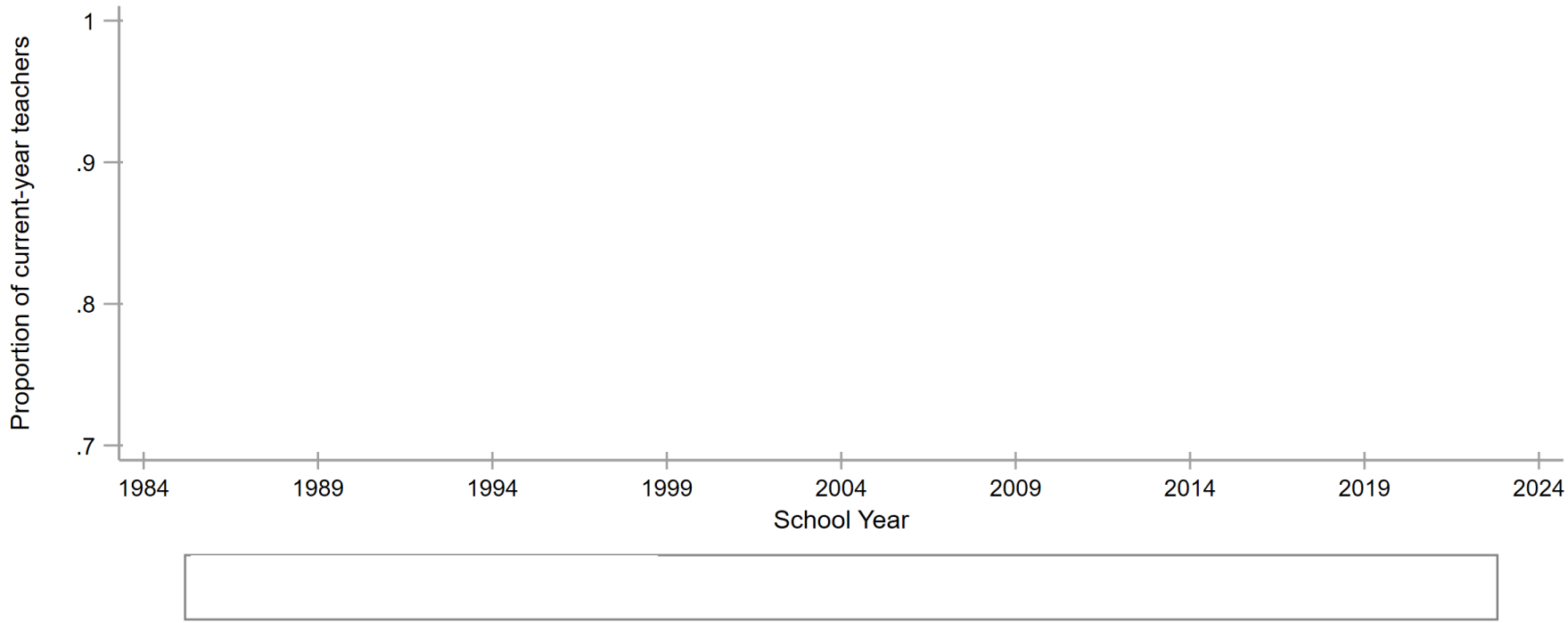
David DeMatthews[1], Jinseok Shin[1], and Pedro Reyes[1]

Teacher Retention in Texas (DeMatthews et al., 2025)



S-275 Dataset (Washington)



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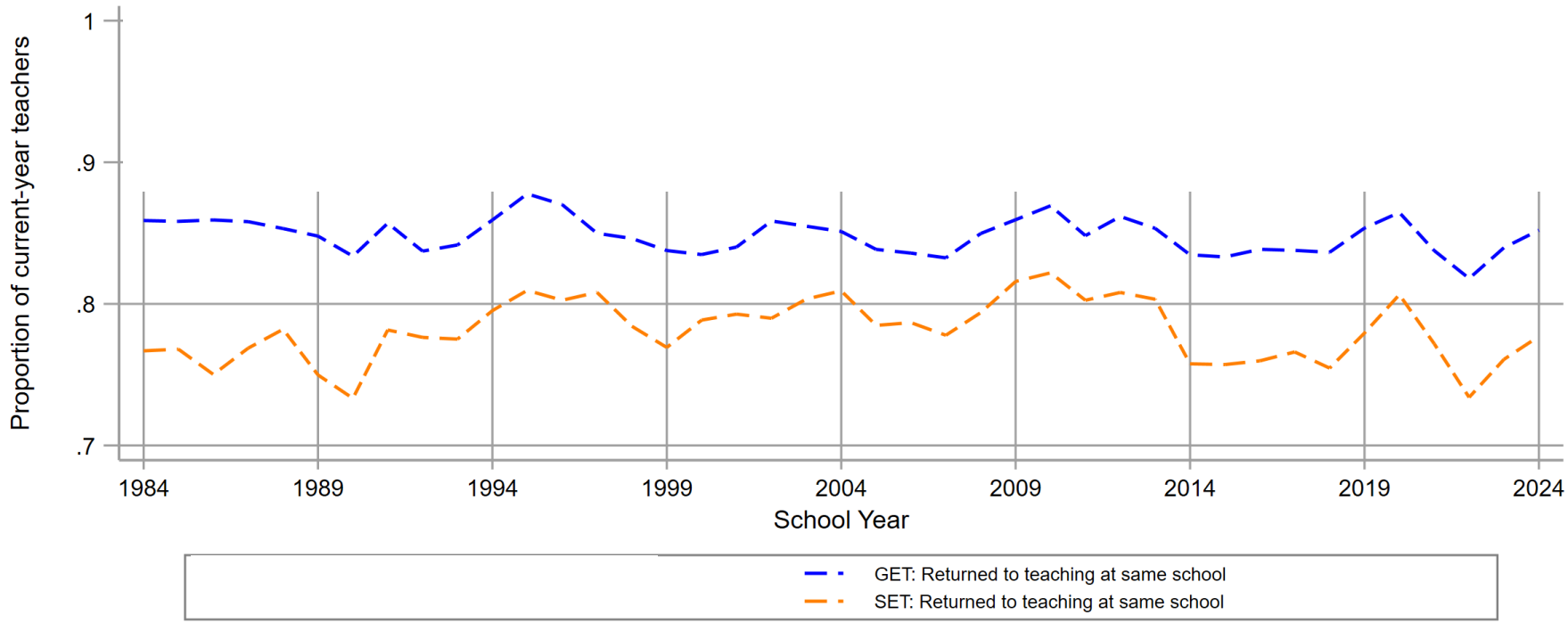
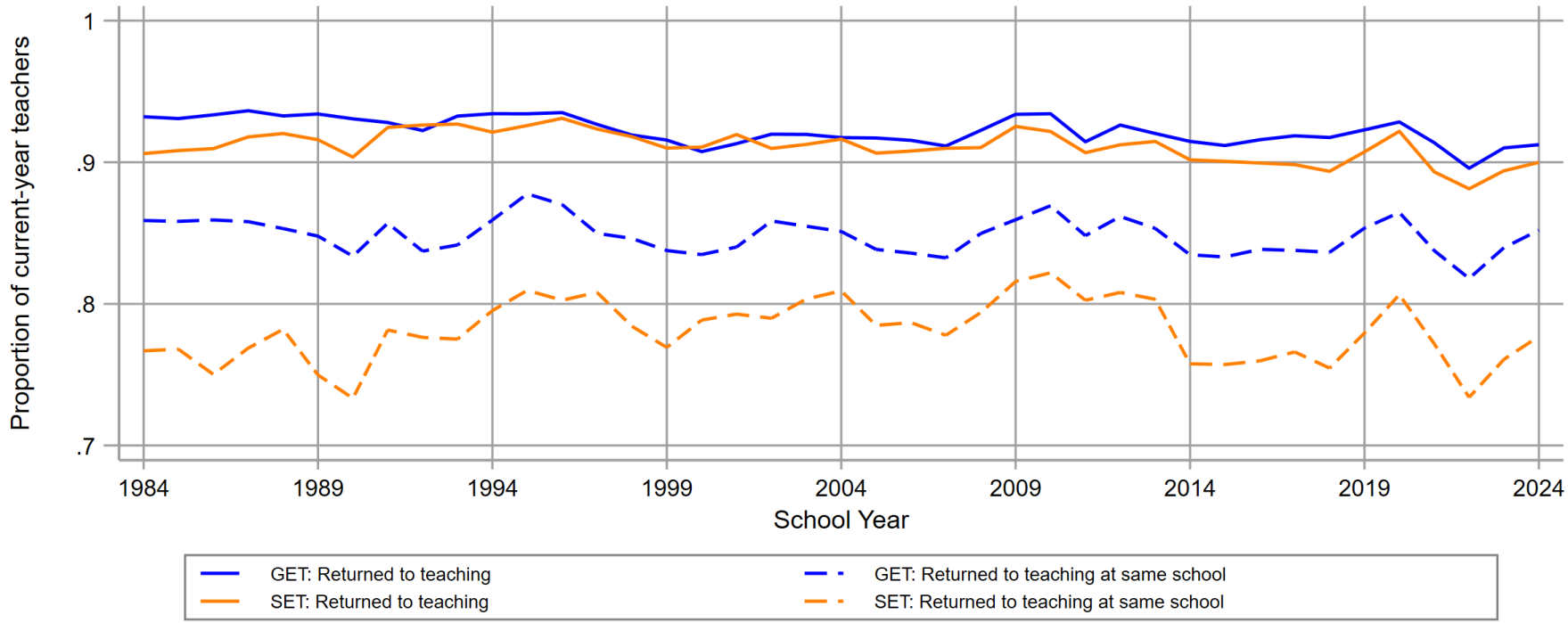
S-275 Dataset (Washington)



S-275 Dataset (Washington)



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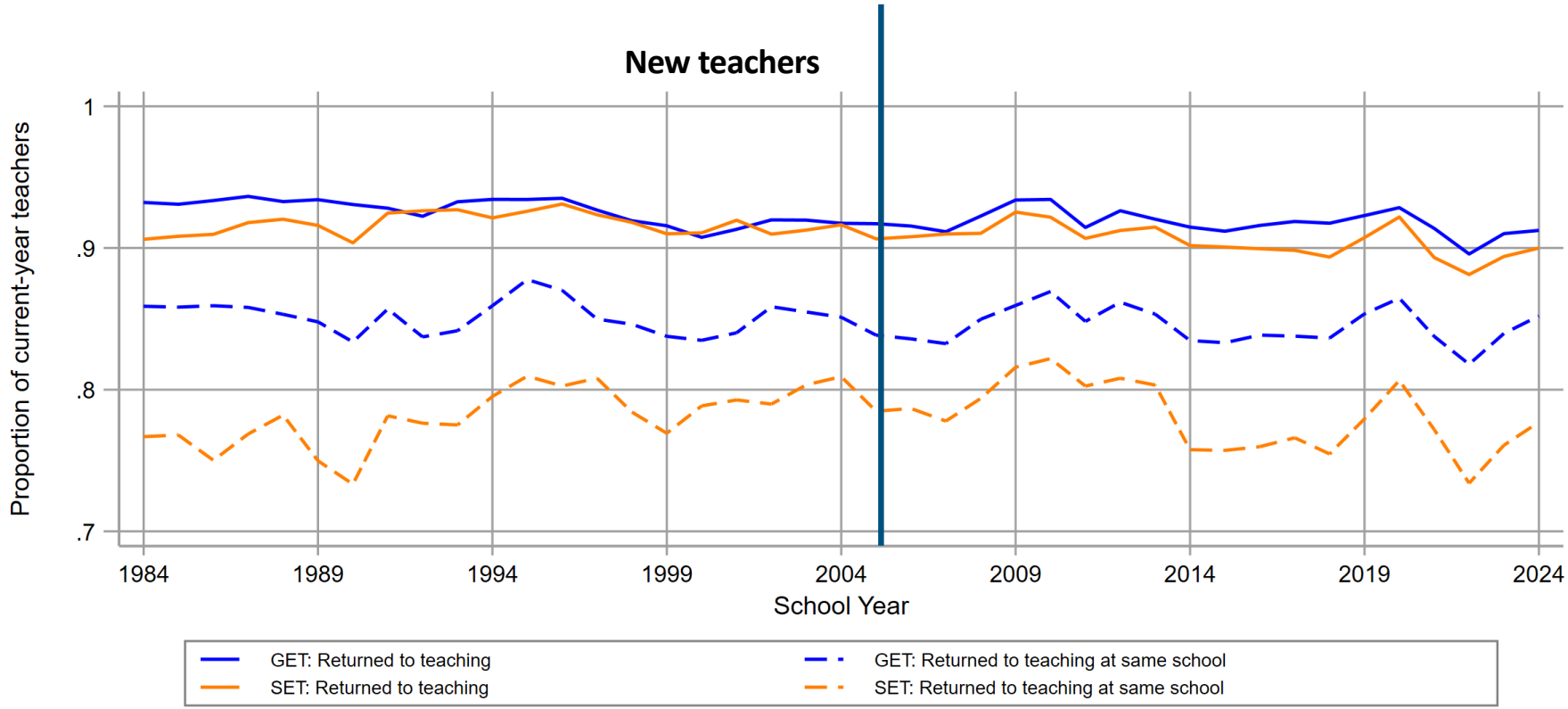

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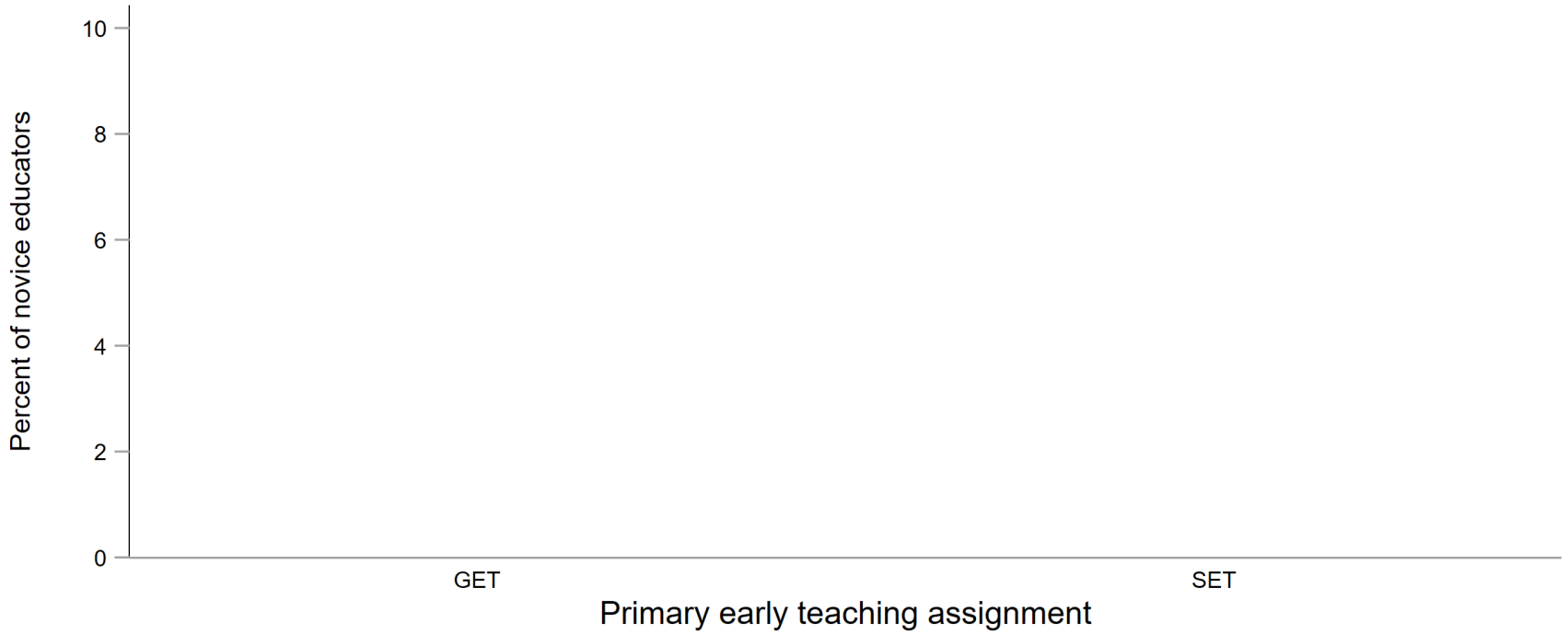
Future Principal Experience of New Teachers



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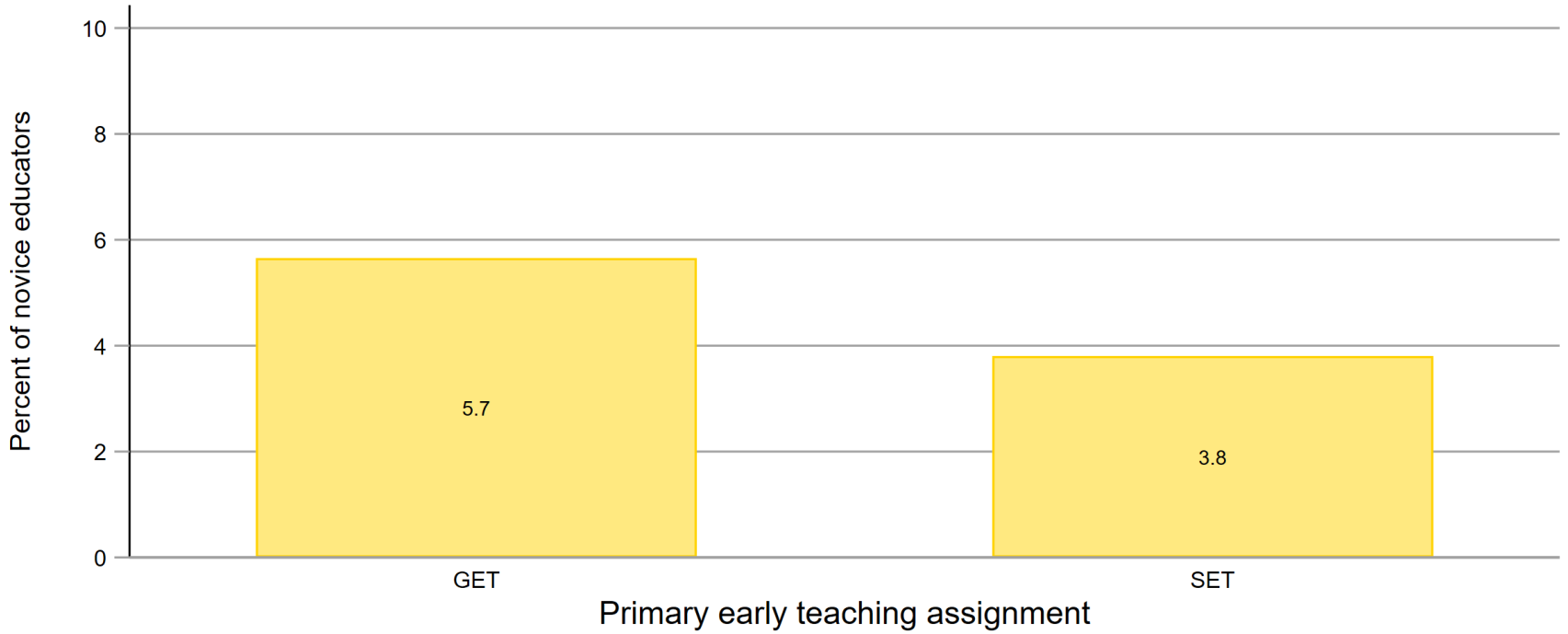

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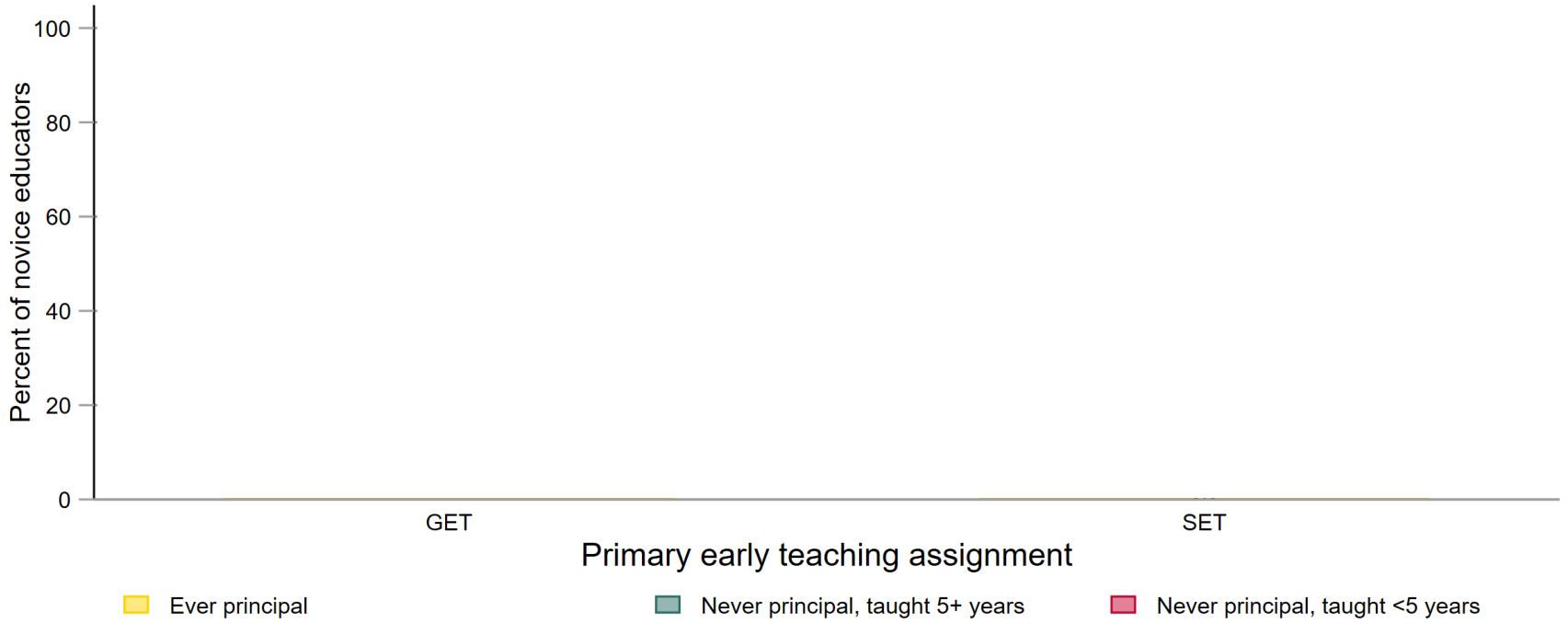
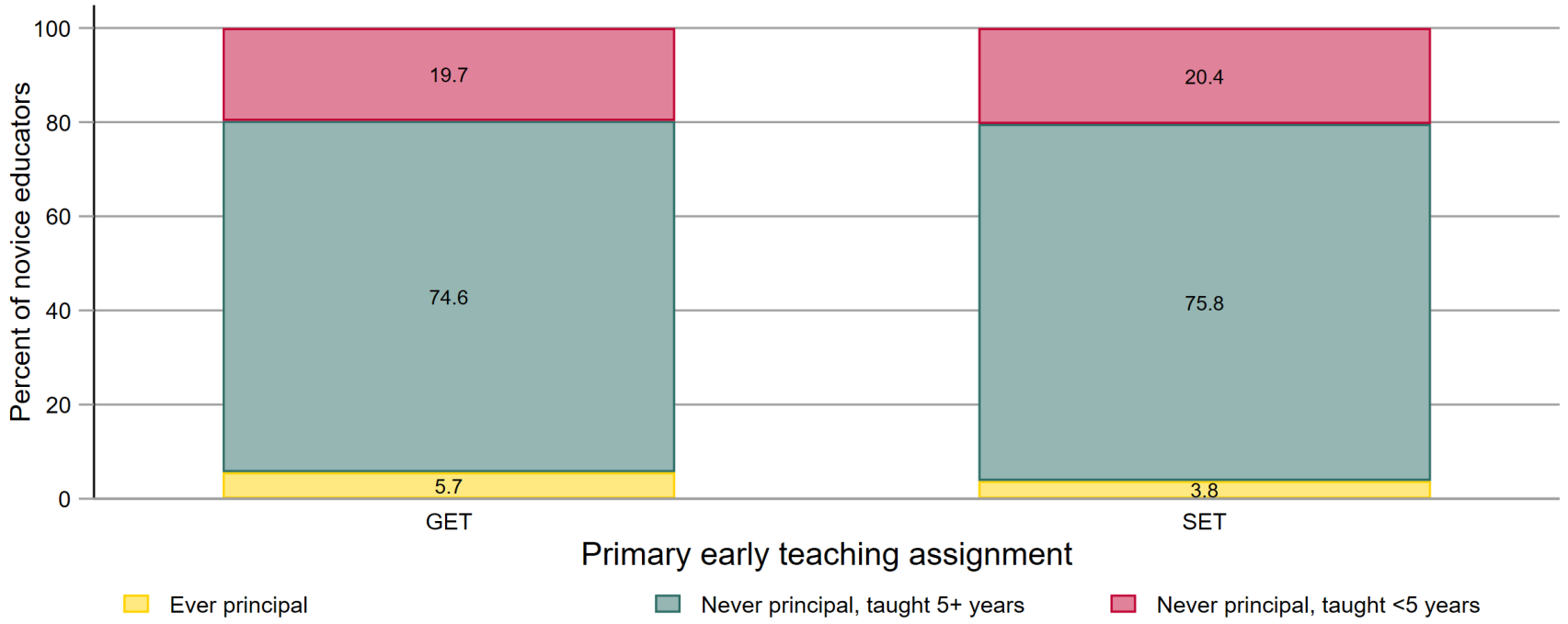


Future Principal Experience of New Teachers



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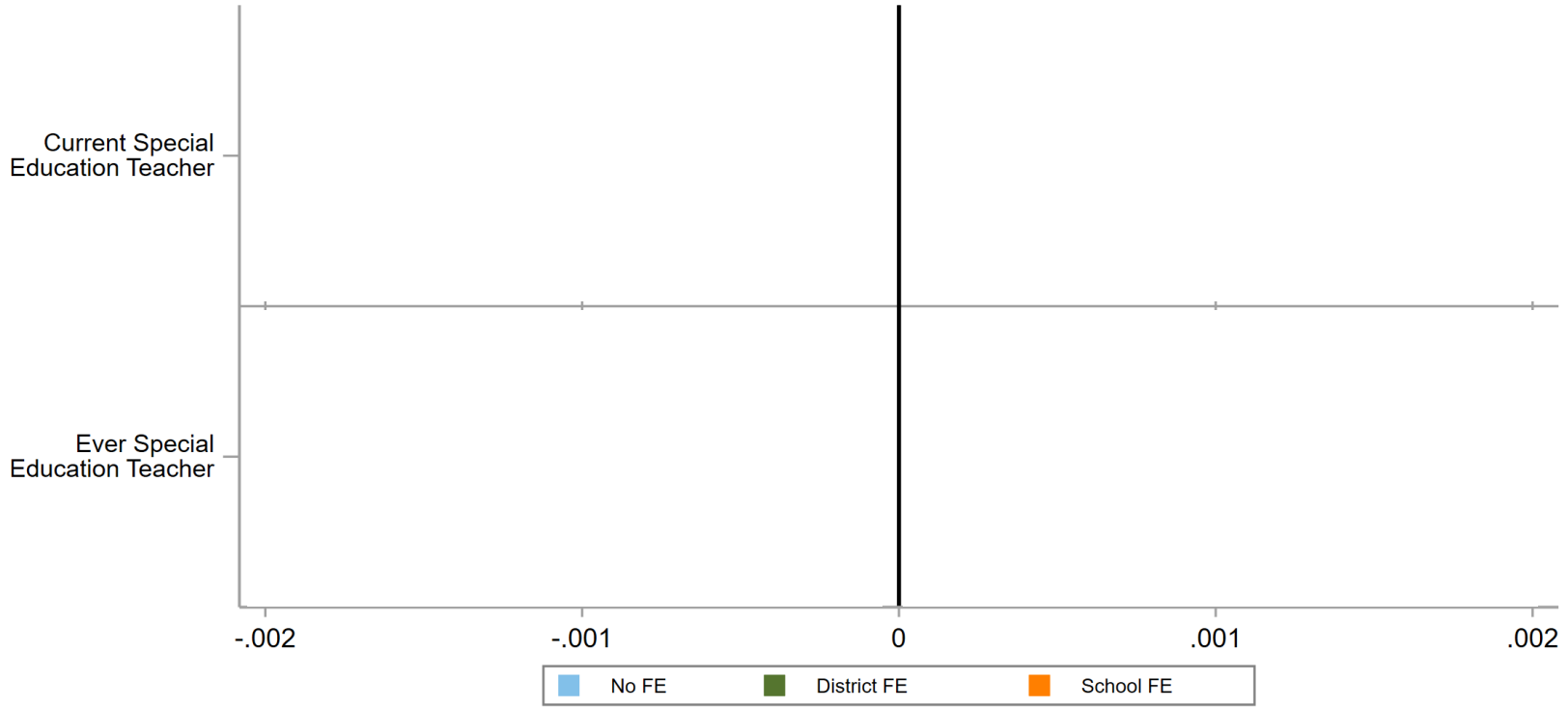
Predictors of Becoming School Principal



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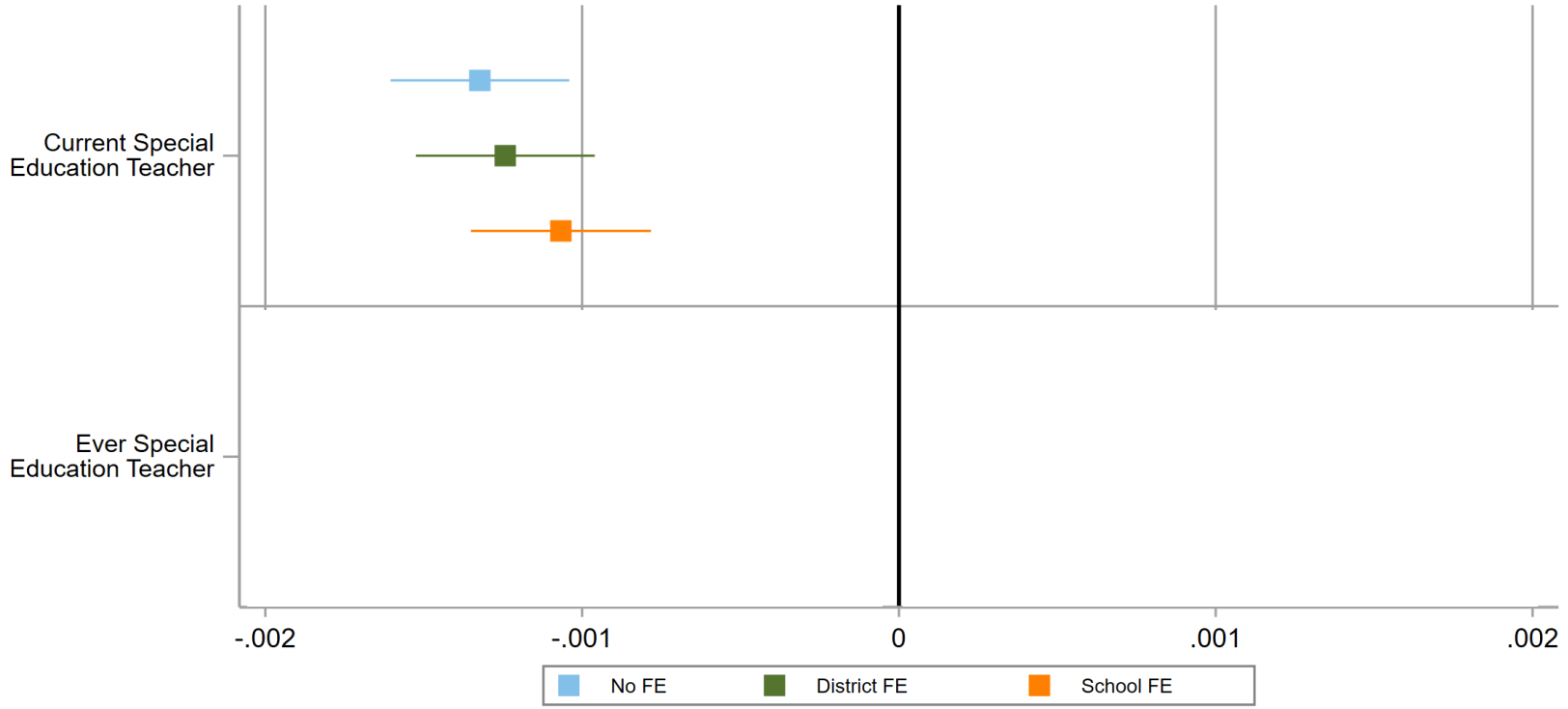

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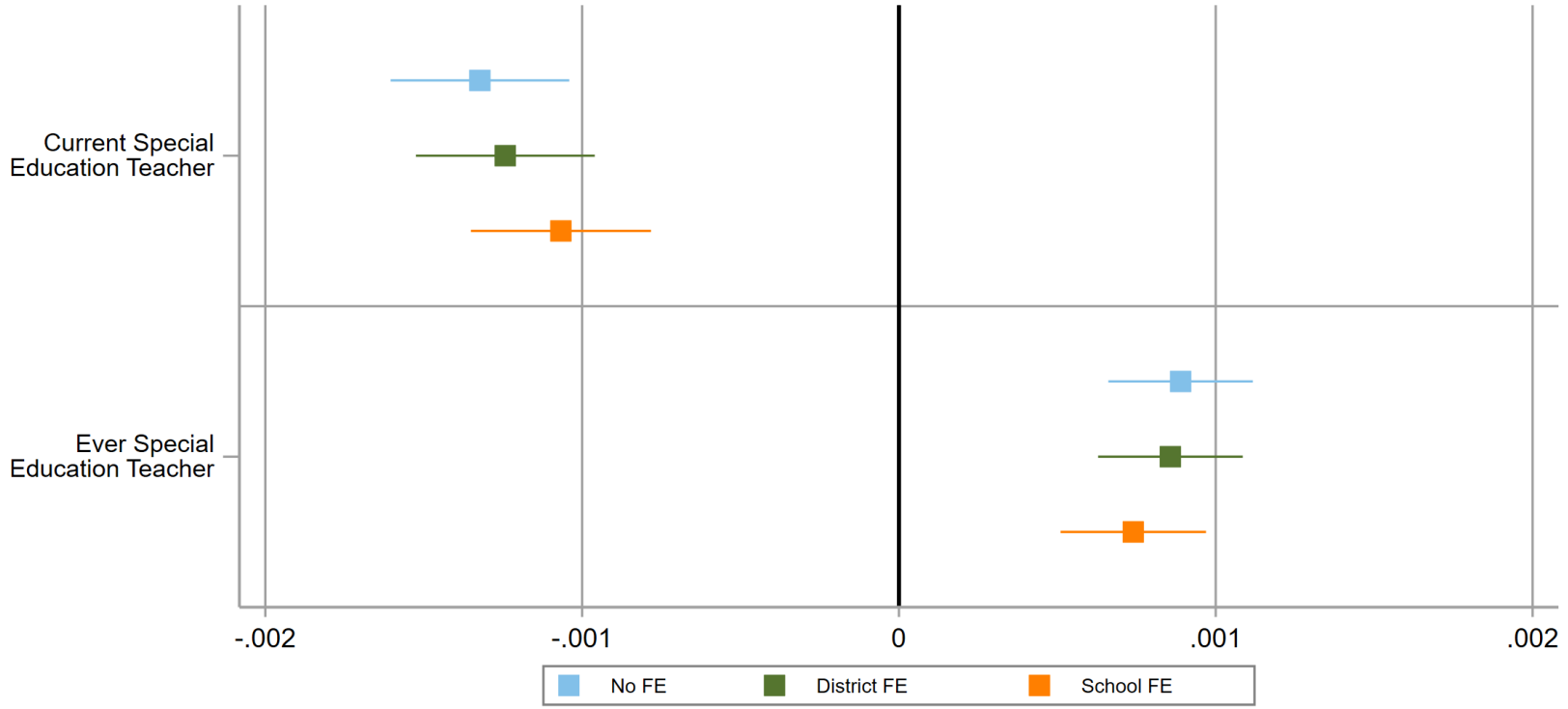
Predictors of Becoming School Principal



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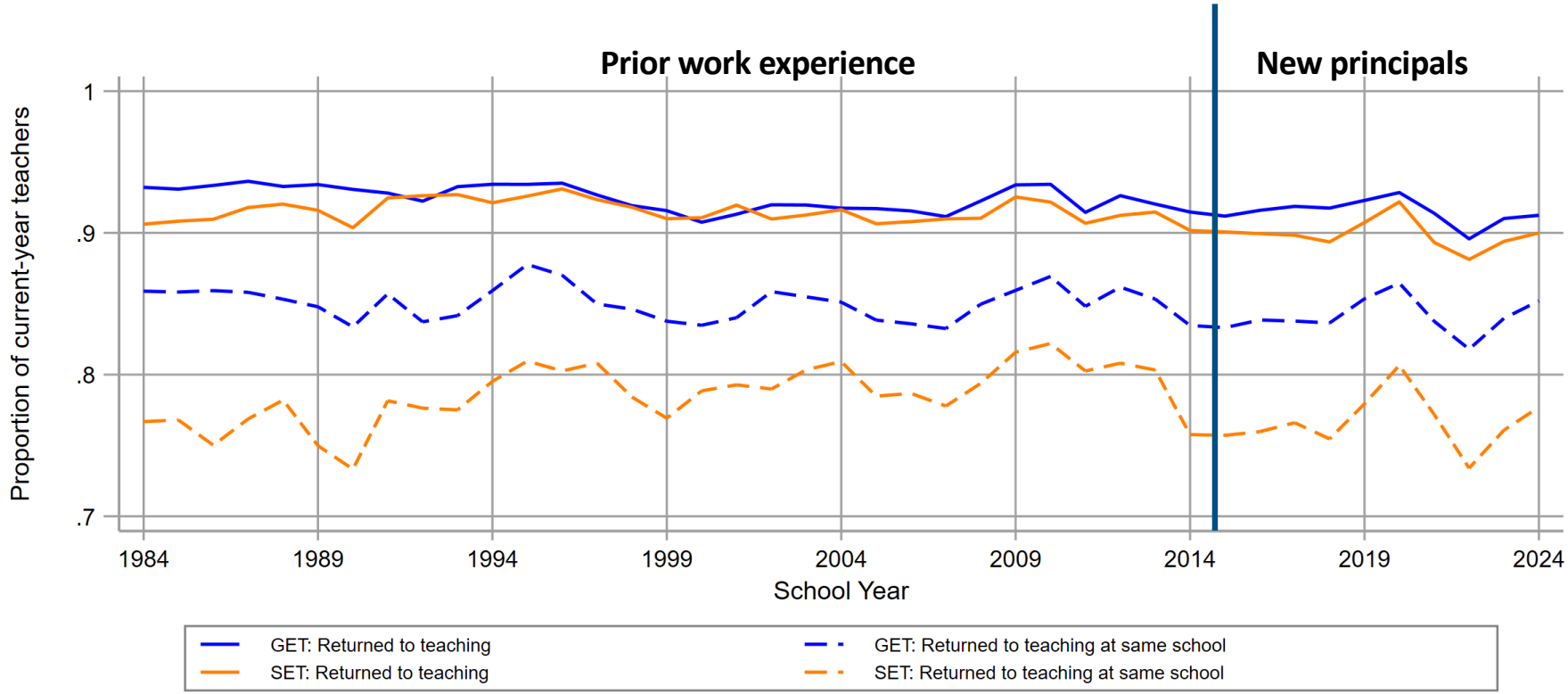
Washington Just-In-Time Analysis: Research Questions

1) Are SETs more or less likely than other teachers to transition into school principal positions?

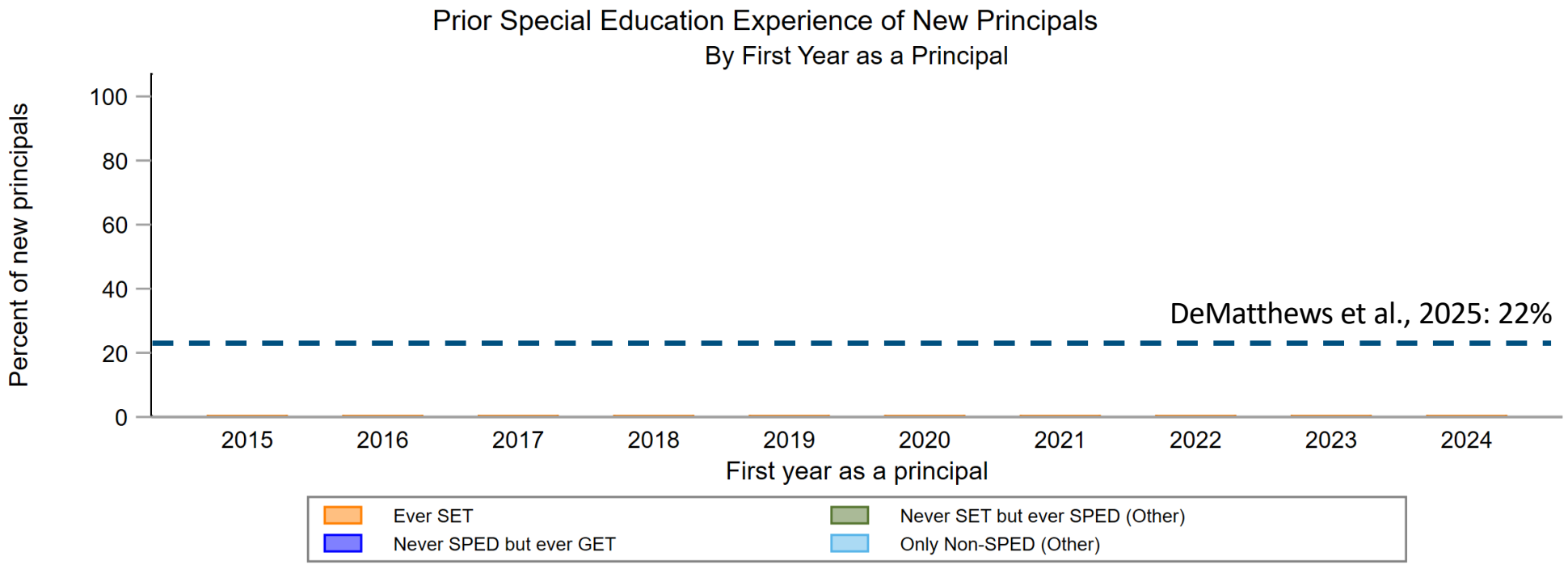
2) What percent of school principals have prior experience in special education in recent years?

3) Are SETs more likely to stay in their positions when their principal has prior experience in special education?

S-275 Dataset



Prior Special Education Experience of Administrators



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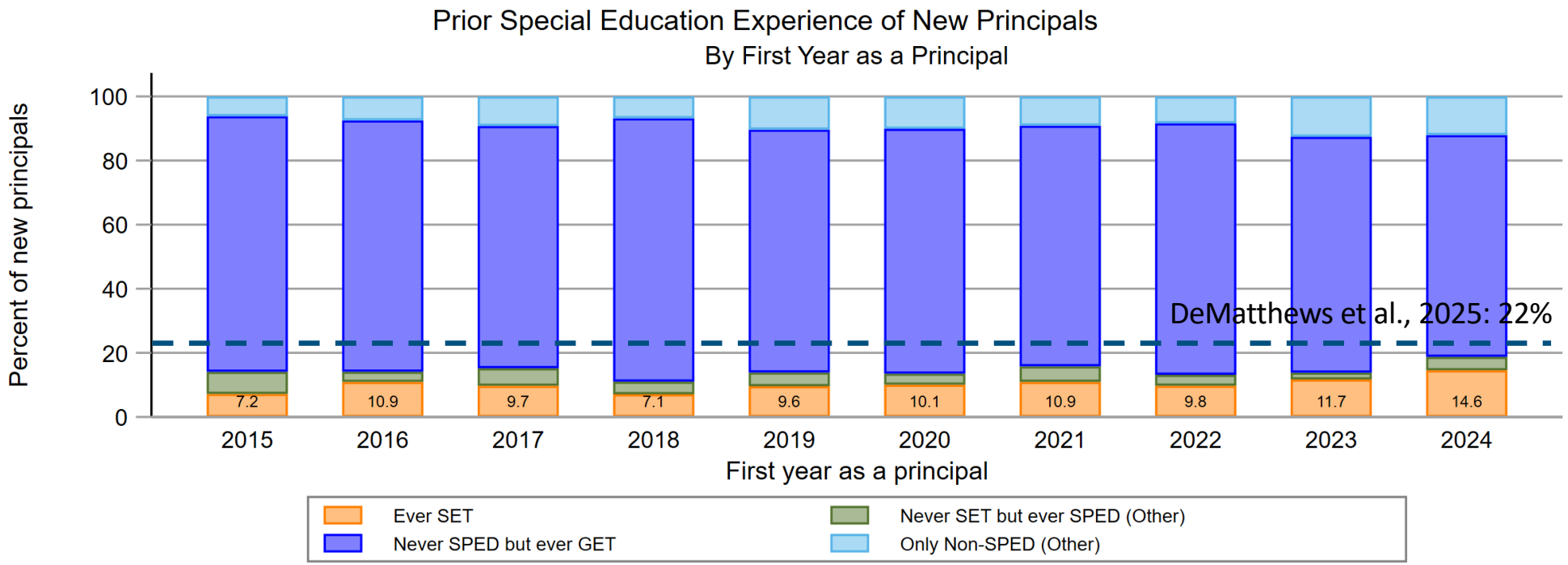

Washington Just-In-Time Analysis: Research Questions

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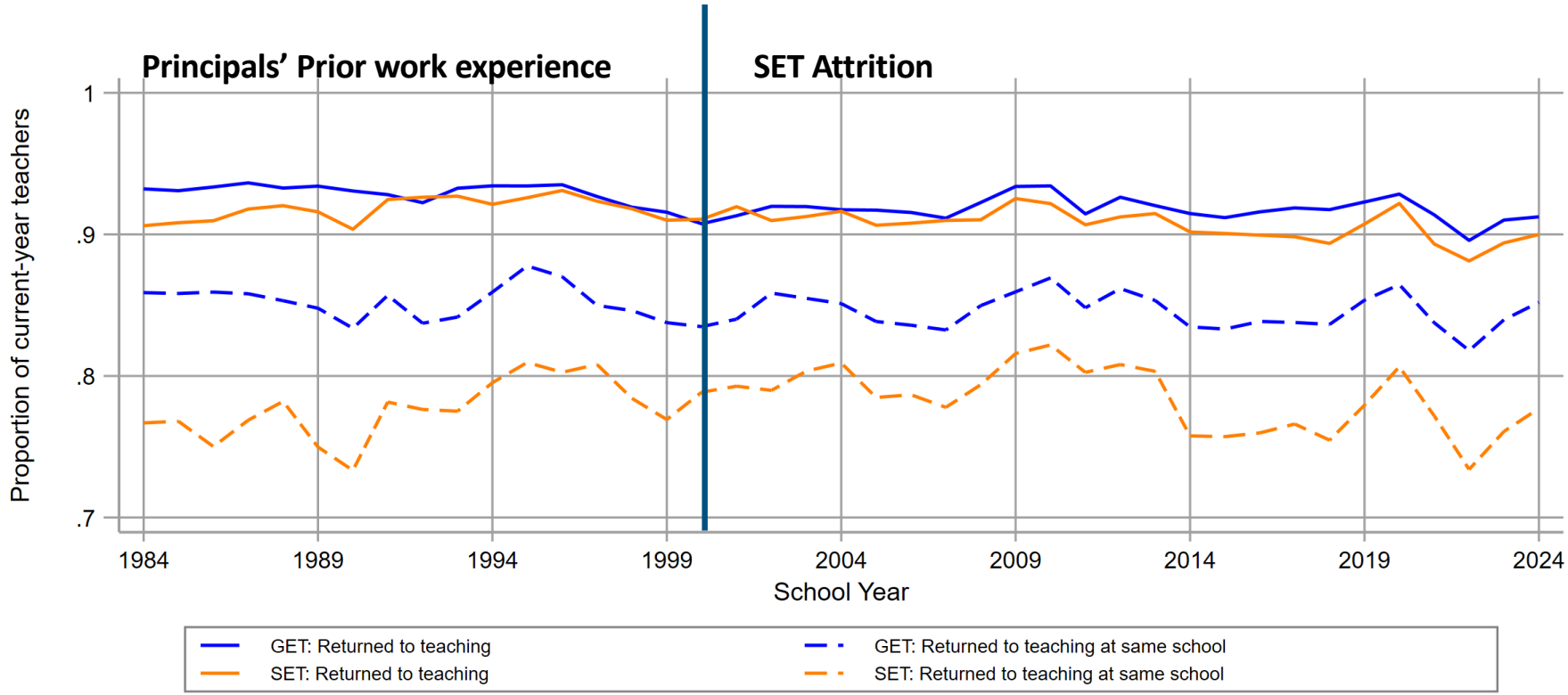

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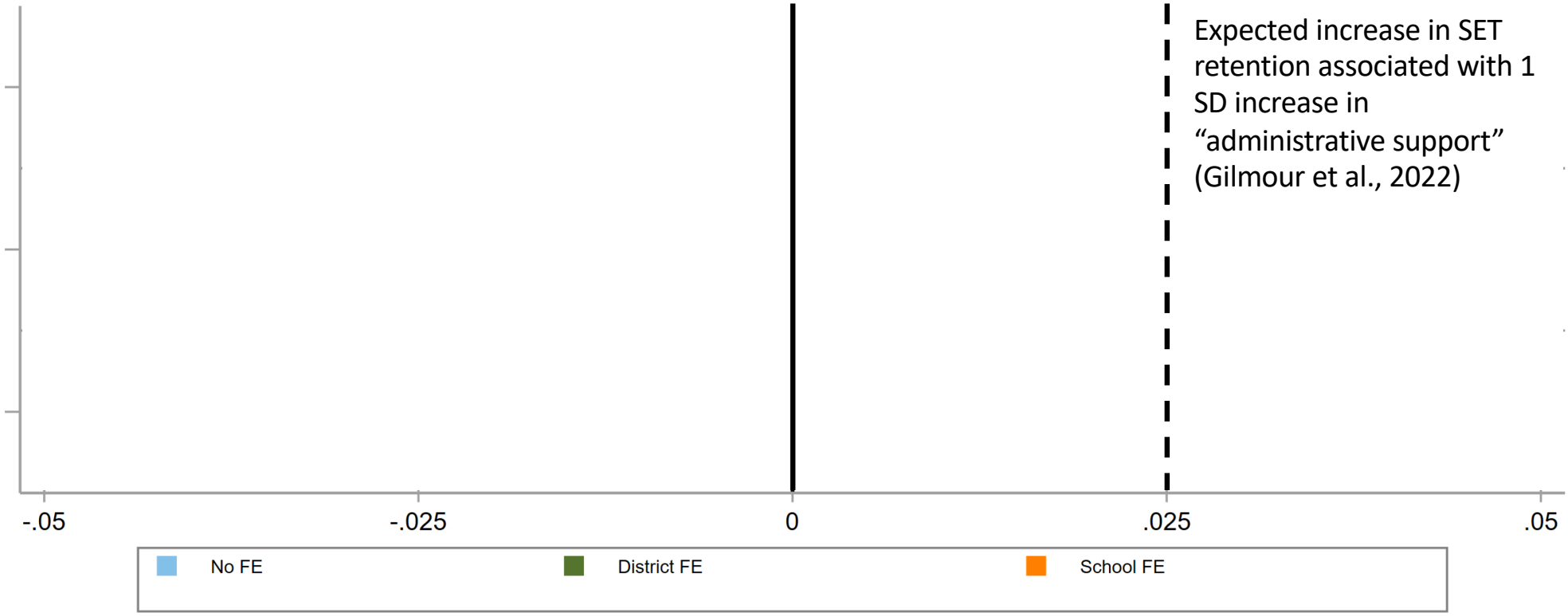
Principal SET Experience Predicting SET Retention in the Same School



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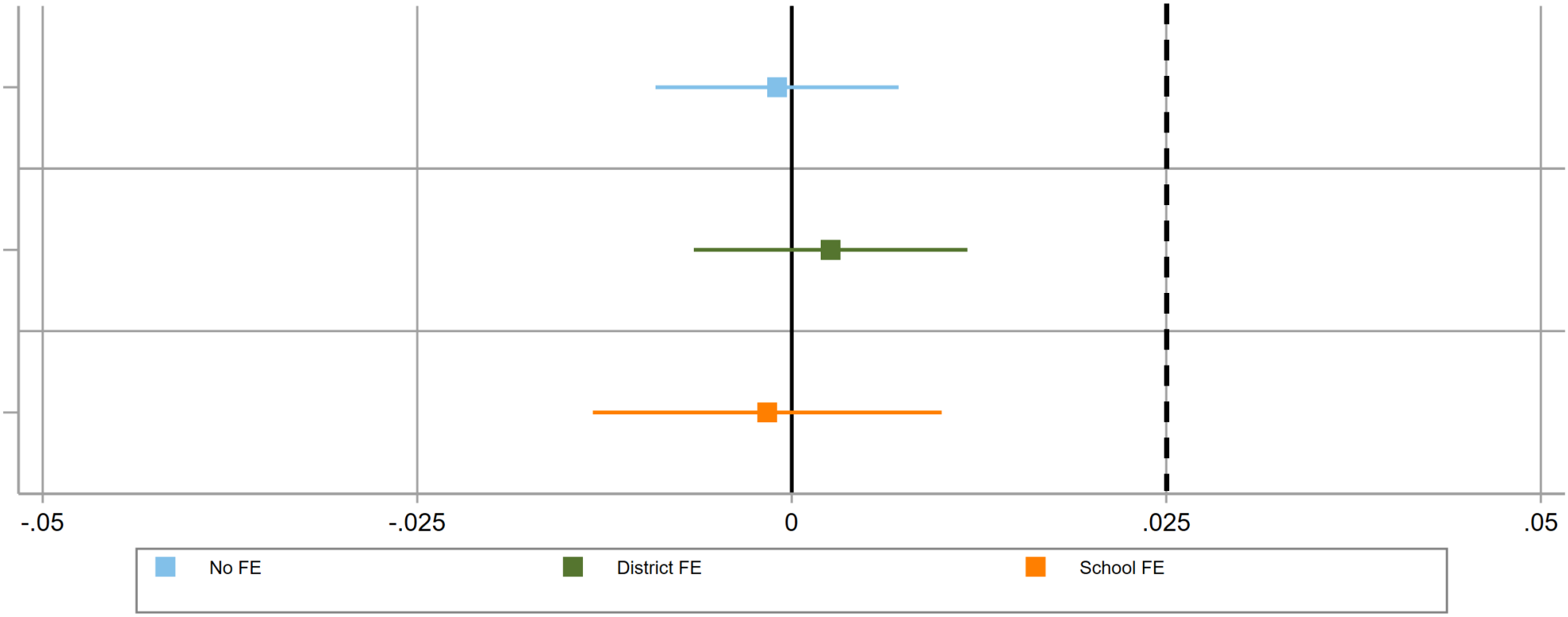

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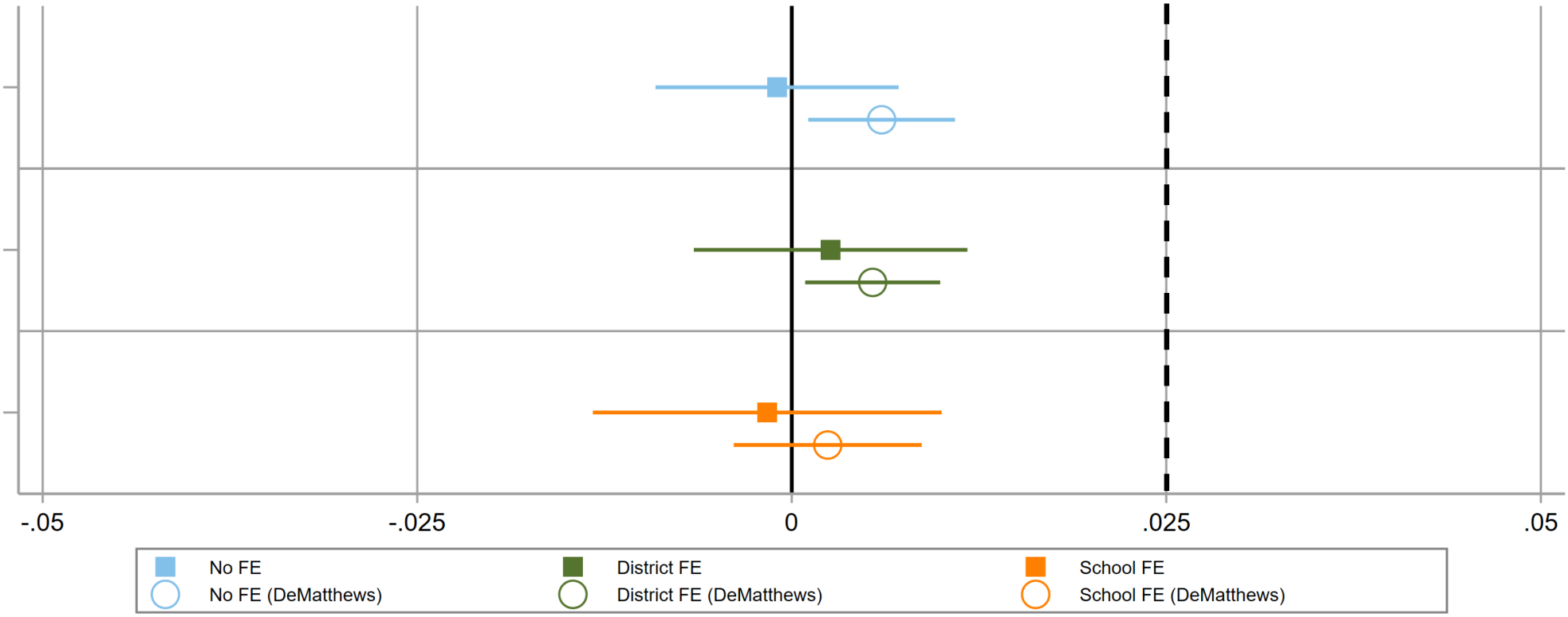
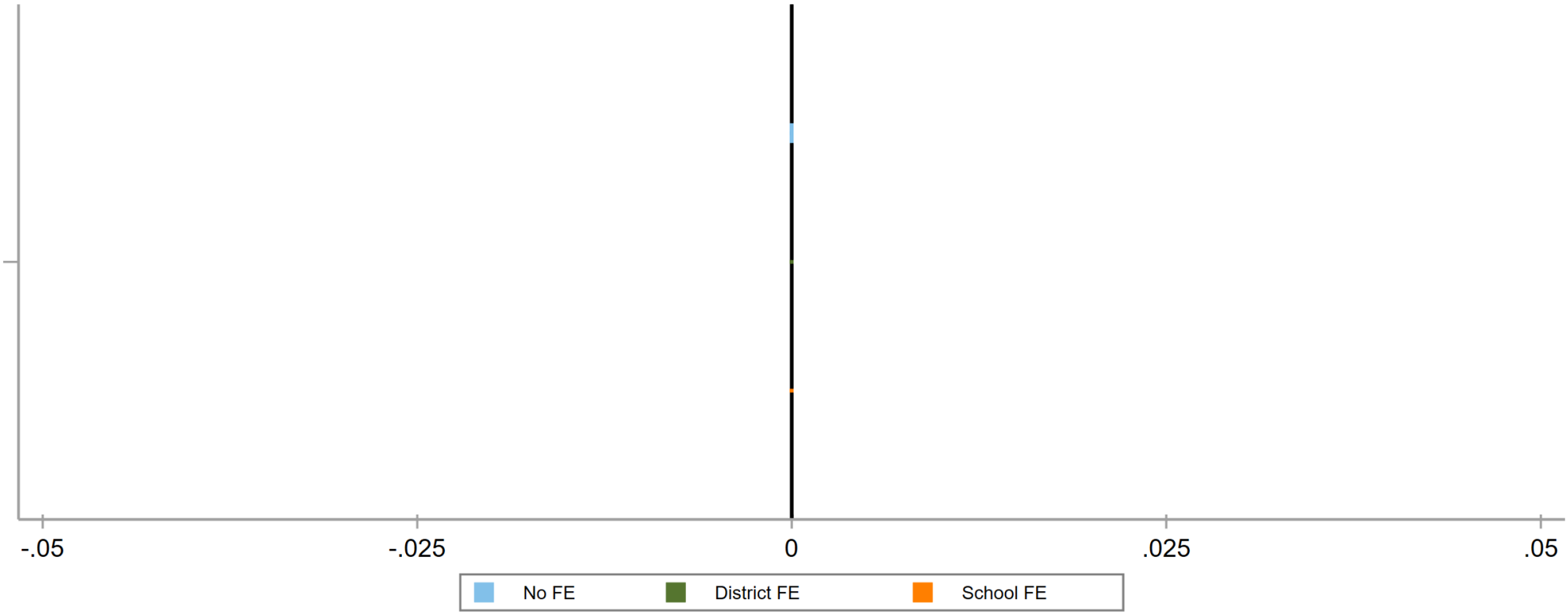
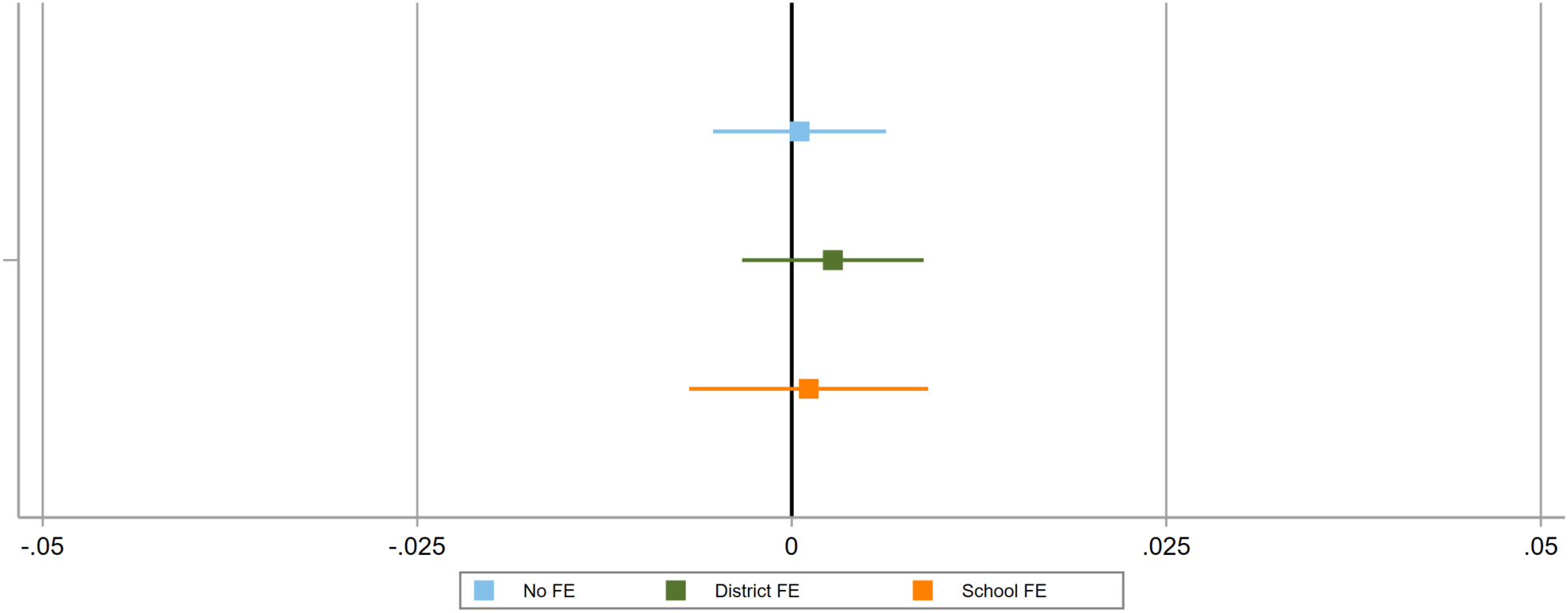


Principal SET Experience Predicting SET Retention in the Teaching Workforce



Principal SET Experience Predicting SET Retention in the Teaching Workforce



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Conclusions

- In Washington, SETs are substantially less likely to become principals than other teachers, though the proportion of principals with special education experience has increased in recent years
- Unlike in Texas (DeMatthews et al., 2025), we find precise null relationships in Washington between principals' special education experience and SET retention in their schools
- **This does not imply that principals do not matter for SET working conditions and retention**; rather, this specific observable characteristic of principals in Washington is not significantly predictive of SET retention

Next steps

1. Special education *licensure* as additional form of principals' special education experience
2. Incorporate information about assistant principals and other school and district administrators
3. Heterogeneity by the settings in which principals got their special education experience (e.g., level of inclusion, special education identification rates, etc.) and school type

Coming soon!

SPARC Center Scholars

The Special Educator Workforce:
A Research Collaborative

- Professional development opportunity for doctoral students and early career researchers
- Participants will be mentored by a SPARC Center Researcher on the use of SLDS in special education policy research
- Applications will be due May 1, 2026

Scan the QR code or visit sparccenter.org to learn more!

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Thank You!

Roddy Theobald, rtheobald@air.org

Session II: Evidence on What Makes Teachers Stay: Schedules, Salaries, and School Leaders

Discussant

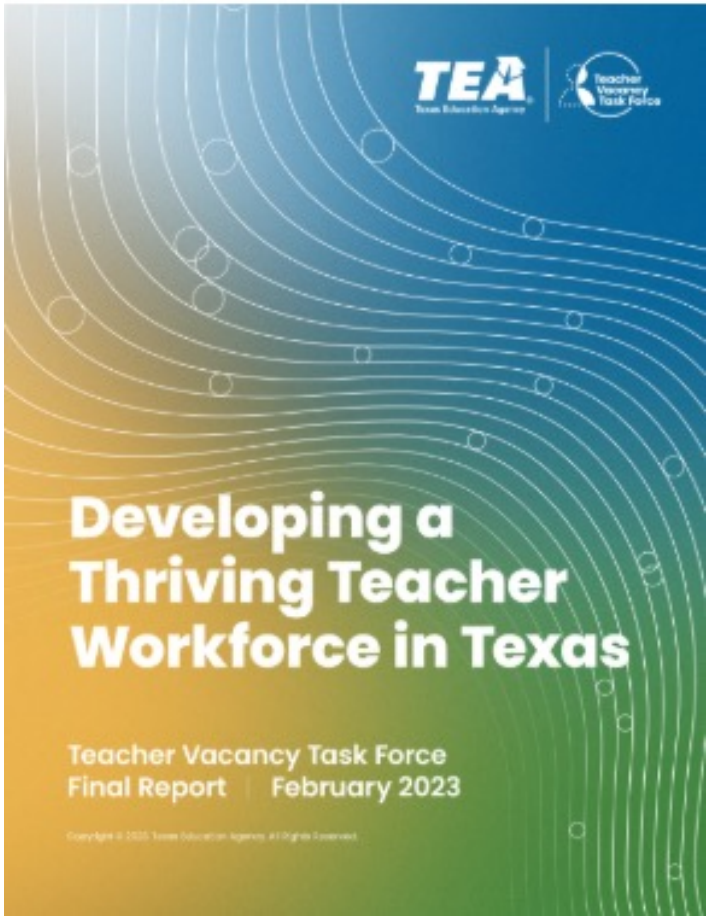
- **Mark Olofson,** Executive Director of Education Data, Research, and Strategy at Texas Education Agency

Paper Presentations

- **Teacher Retention and the Four-Day School Week**. Andrew Camp, Brown University
- **Teacher Salary Raises and Teacher Turnover: Evidence from the Arkansas LEARNS Act.** Gema Zamarro, University of Arkansas, CALDER-R&R
- **Principals with Special Education Experience and Special Education Teacher Attrition.** Roddy Theobald, CALDER/AIR, SPARC

Additional Perspective

Brief note on the Texas Context



What is House Bill 2?

House Bill 2 is a comprehensive school finance bill that supports students and infuses more dollars and resources into Texas public schools than ever before. Passed by the 89th Texas Legislature and signed by Governor Greg Abbott, this bill provides critical supports in several key areas.

- Teacher Compensation
- Educator Preparation
- Educator Rights
- Special Education
- Early Literacy & Numeracy
- Career and Technical Education
- Finance & Safety

TEACHER INCENTIVE ALLOTMENT

Key Intersections with the Texas Context

4 Day School Week

- Similar settings
- Conflicting evidence for impact on teacher retention?

Teacher Pay

- Similar challenges named
- Different approaches?

Special Ed Leadership Theobald

- Slightly higher prevalence
- Intersection with principal standards?

Broader Thoughts

Keeping a Focus on Student Outcomes

Providing Support for Policy Implementation

Lunch Time!

Get your lunch
and return for…

Session III: Who Becomes a Teacher? at **1:00** ⏰

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Session III: Evidence on Who Becomes a Teacher: Selection Across the Preparation and Hiring Pipelines

Paper Presentations

- **The Beginning of the Teacher Pipeline: Which College Students Apply to Teacher Education Programs?** John Krieg, Western Washington University
- **Alternative Pathways in Massachusetts.** Ben Backes, CALDER/AIR
- **Probability of Advancing Through the Hiring Pipeline.** Dan Goldhaber, CALDER/AIR

Discussant

- **Sara DeLano,** Dean, Educator Pathways, School of Education, Dallas College

The Beginning of the Teacher Pipeline: Which College Students Apply to Teacher Education Programs?

Dan Goldhaber, Roddy Theobald, Amy Roth McDuffie, David Slavit,

Jennifer Dechaine-Berkas, John M. Krieg, Vivien Chen, Emma Dewil

Acknowledgments: We thank three public universities and Washington's ERDC for providing the data that made this work possible and NSF for providing support for this study (DUE # 1950030).

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Background

- The front end of the teacher pipeline – who expresses an interest in teaching and/or training to teach – has been a major concern
  - Declines in enrollment in teacher prep relative to a decade ago
  - Percent of parents wanting their children to teach has dropped from 70% in 2010 to less than 40% in 2021 (PDK International)
  - "The current state of the teaching profession is at or near its lowest levels in 50 years." (Kraft & Lyon, 2024)

Interest in Teaching vs Other Preprofessional Programs

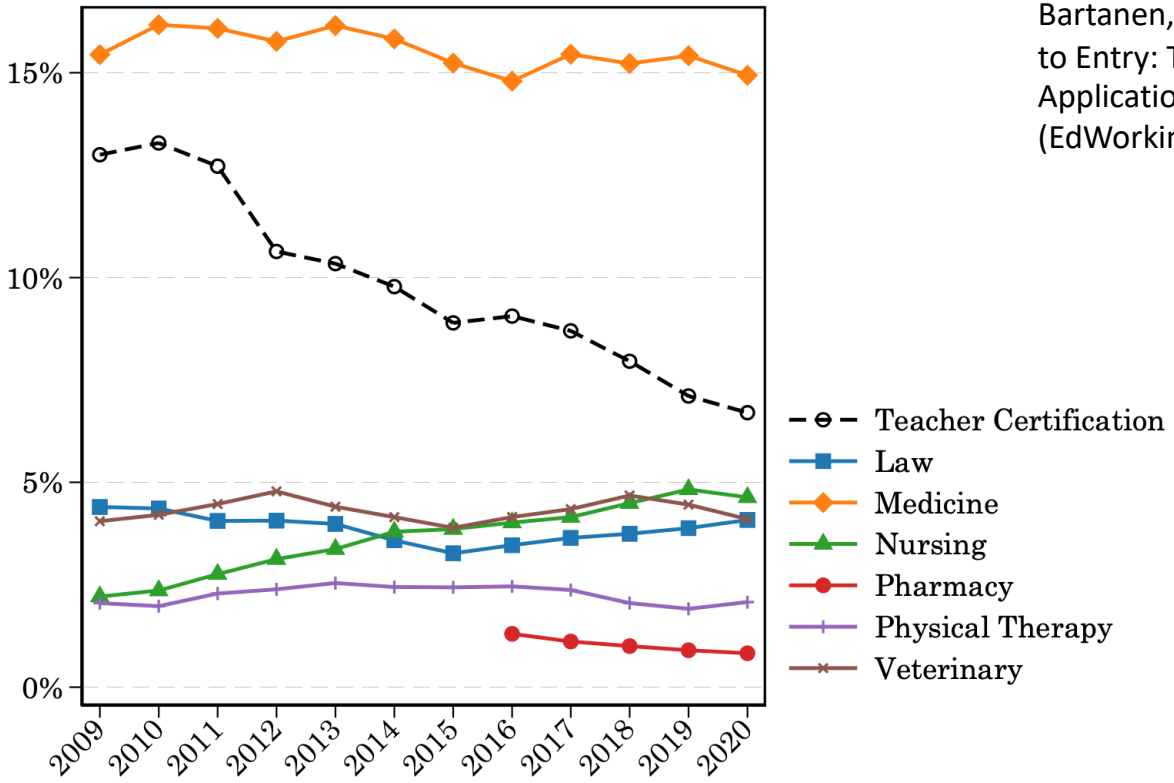

Figure 1

Interest in Teaching and Preprofessional Programs

Bartanen, B. & Kwok, A. (2022). From Interest to Entry: The Teacher Pipeline From College Application to Initial Employment. (EdWorkingPaper: 22-535).

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Quick Questions and Answers

1. **What pre-college characteristics (gender, race/ethnicity, and SAT scores) predict *interest* in education at time of university application?**
   - Just what you would expect! Strong demographic differences in interest that mirrors existing teacher demographics
   - Declining interest in teaching for students with higher SAT scores
2. **What pre-college and college course taking variables (e.g., GPA, Gateway Course Performance) predict *applying* to a TEP?**
   - Also strong demographic differences in application rates *even conditional on education interest*
   - Conditional on initial interest, differences in rates of TEP application by SAT scores and cumulative college GPA are relatively small as is performance in introductory courses.

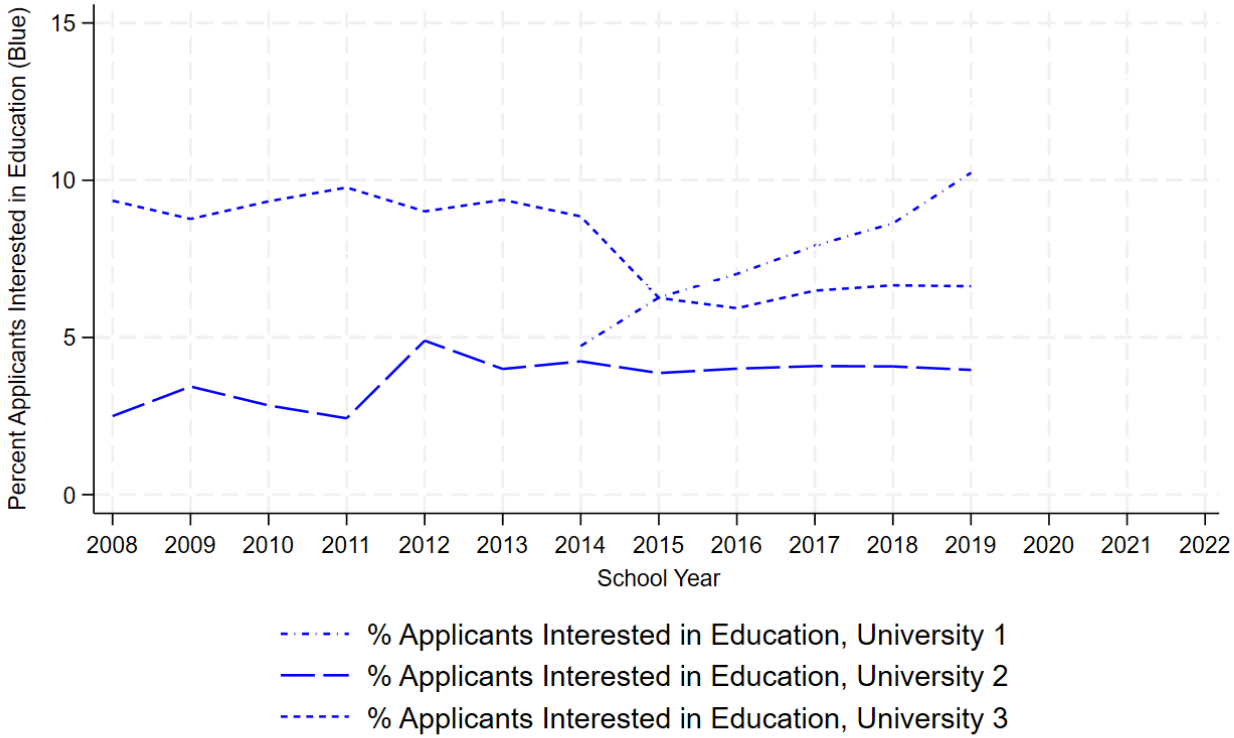
Why Does This Matter?

- We know that who becomes a teacher is very important to student outcomes
- Role models matter—especially in demographic matching between students and teachers
- We know very little about sorting of potential teachers within universities—does this sorting lead to better teacher outcomes?
- A common perception is that students who perform poorly in their preferred subjects turn into teachers. We can test this.

Data

- Application and TEP enrollment data from three large public universities in Washington State; we focus on undergraduate TEP programs from 2013-14 to 2018-19 in University 1 and from 2007-08 to 2018-19 in Universities 2 and 3
  - Get demographics, SAT, and expressed interest in teaching at point of university application (undecided is counted as non-interest in education); identify if student is a transfer student.
- University data are merged with higher education transcript records maintained by Washington's Education Data and Research Center
  - Annual measures of cumulative GPA, if a student took a gateway course in an area of their interest, and GPA in gateway courses
- Sample consists of over 250,000 annual student-year observations and nearly 100,000 *unique* students at these three universities

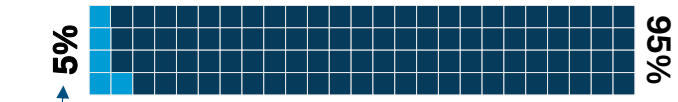
Percent of Students Interested in Education at Time of Application by Institution and Application Year



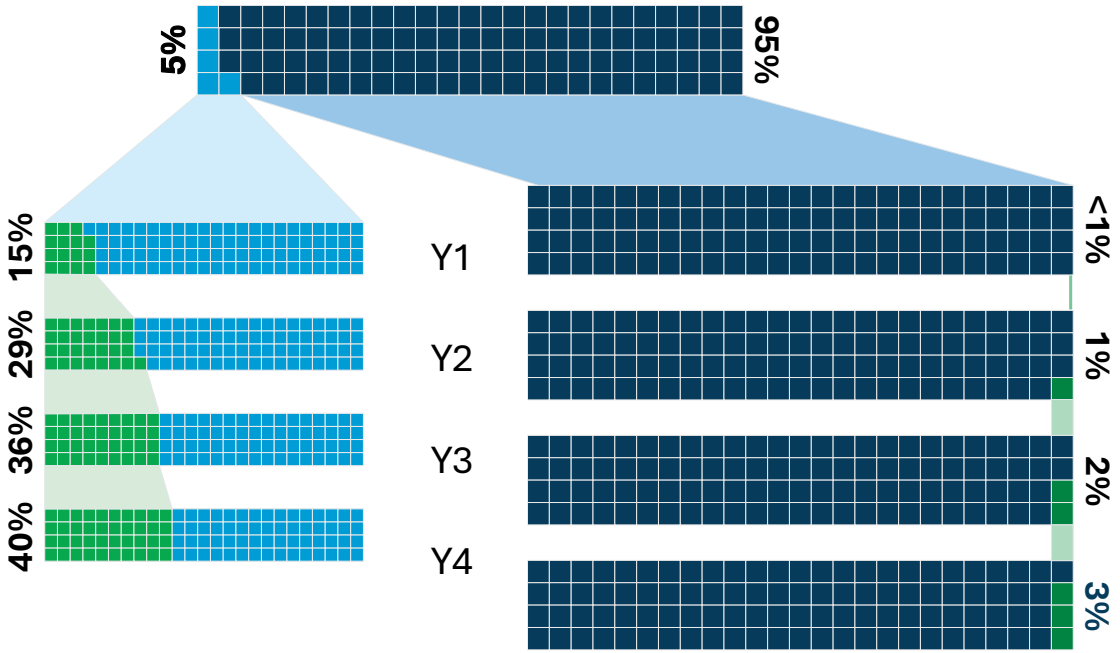
Do students who express interest in education eventually apply to a TEP?

What about students who don't express interest?

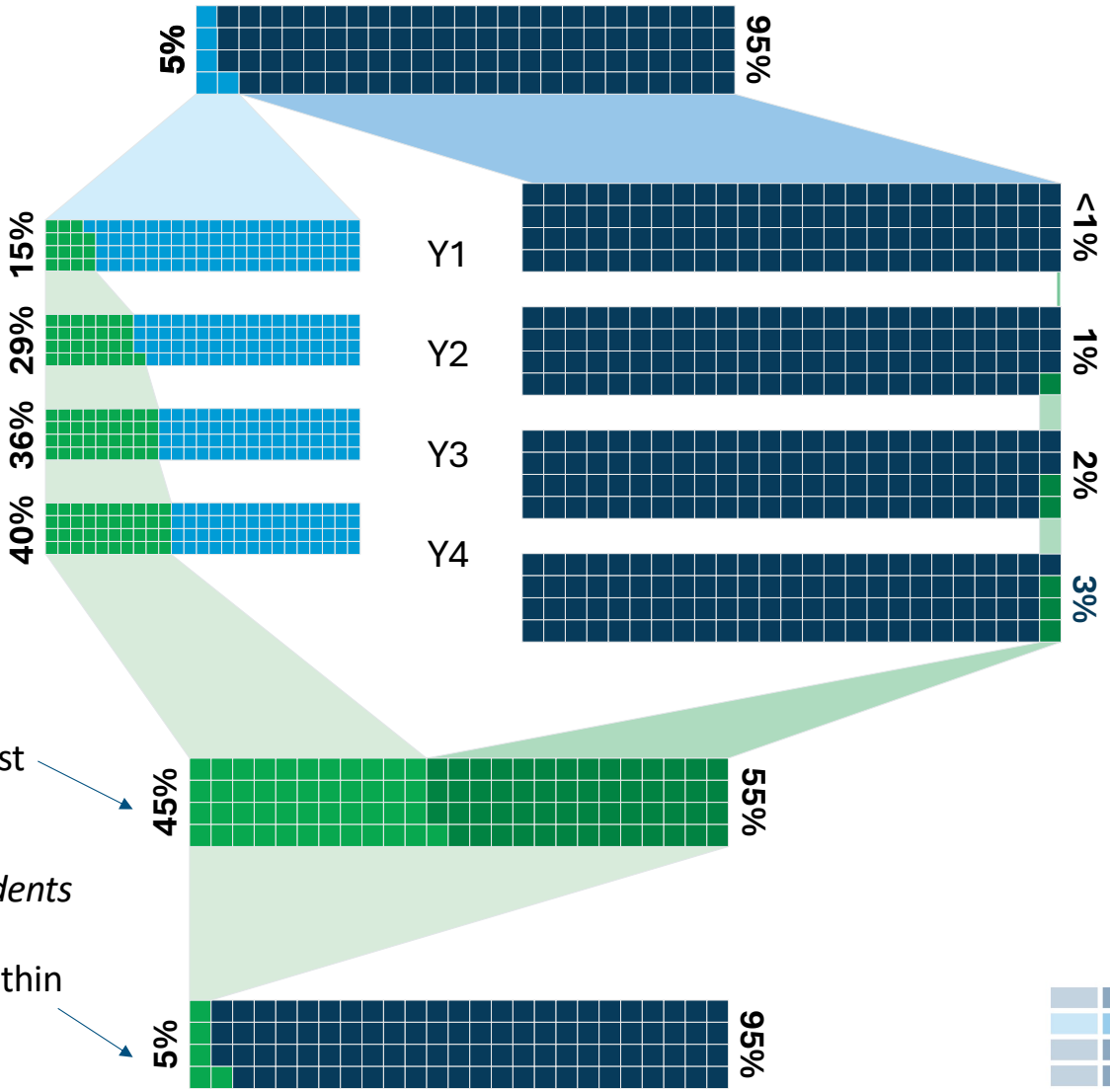
Share of students who say they're interested in education in their college applications



Share of *interested* students who later apply to teacher education programs each year after they applied to college…



Share of *uninterested* students who apply to teacher education programs…



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Research Questions

1. **What pre-college characteristics (gender, race/ethnicity, and SAT scores) predict *interest* in education at time of university application?**
2. What pre-college and college coursetaking variables (e.g., GPA, Gateway courses) predict *applying* to a TEP?

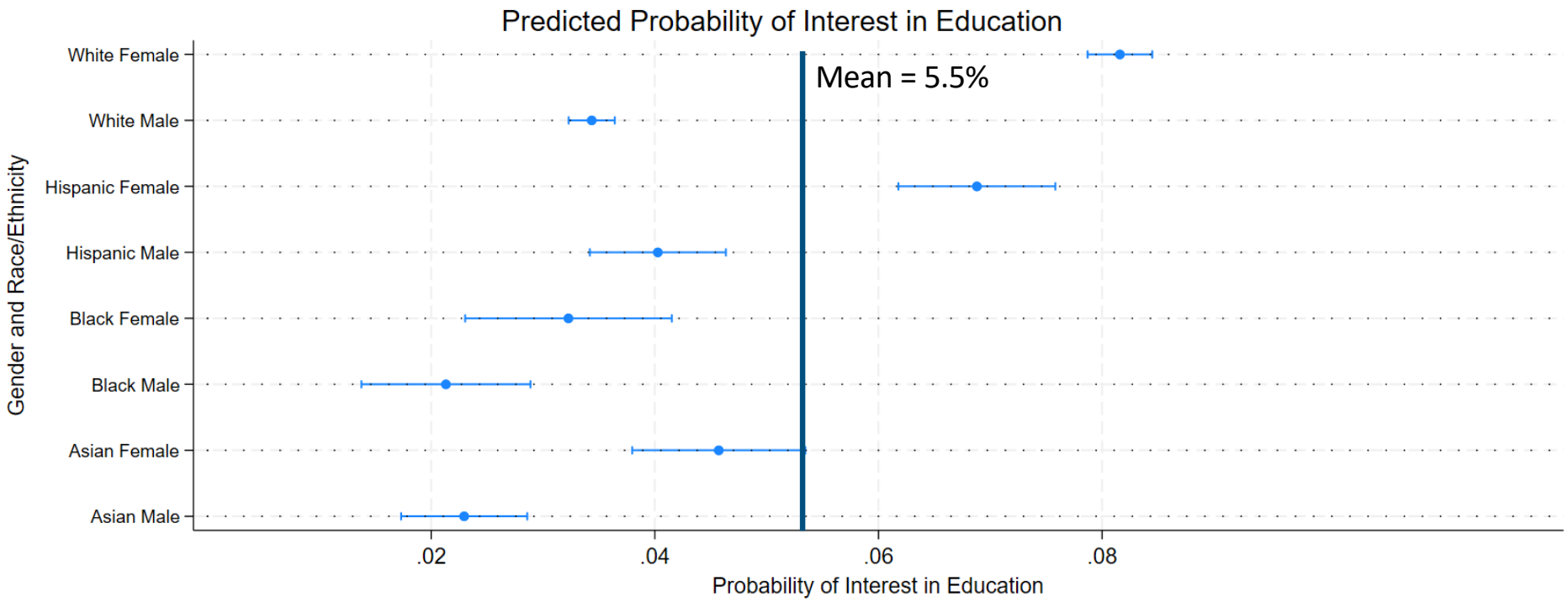
Analytic Approach

1. We look at two separate measures:

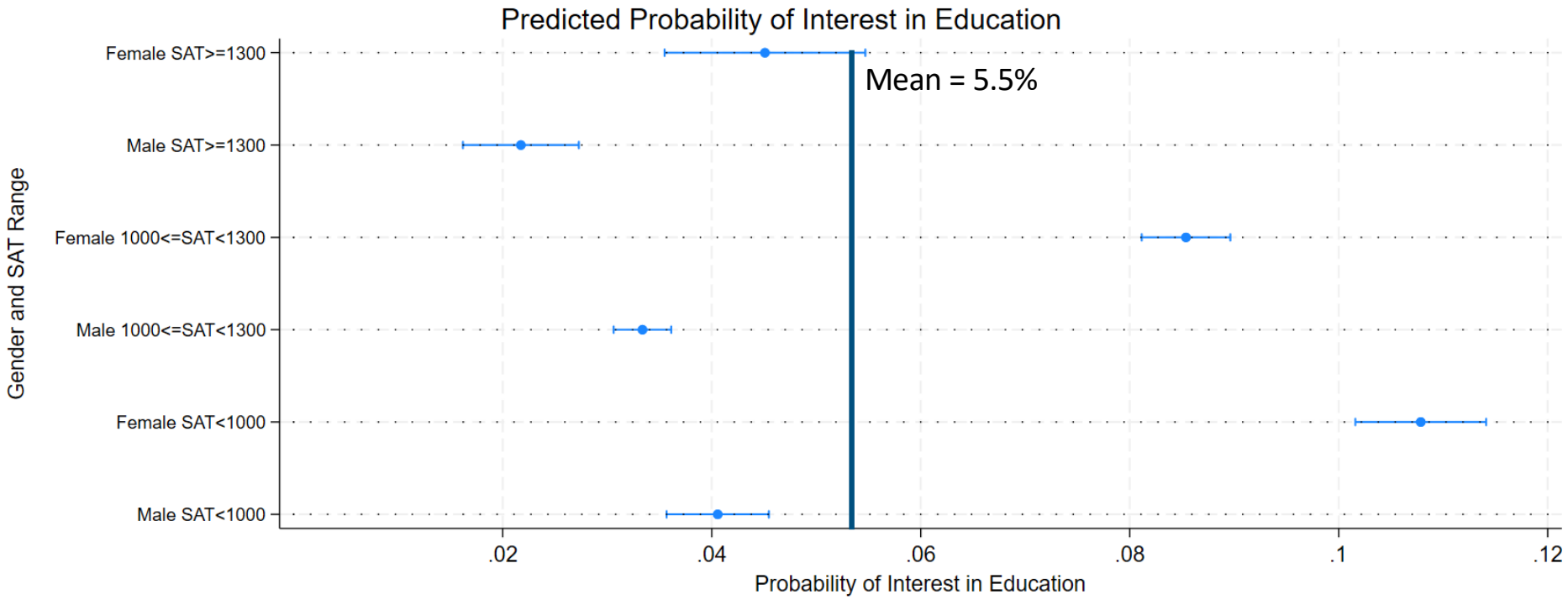
- What determines initial interest in education at the time of college application
- What determines applying to a TEP

2. Estimates control for observable factors like the university attended, time, race, gender, SAT scores and, in some models, the performance in gateway courses.

Predicted Probabilities of Interest in Education by Student Gender and Race/Ethnicity



Predicted Probabilities of Interest in Education by Student Gender and SAT Scores



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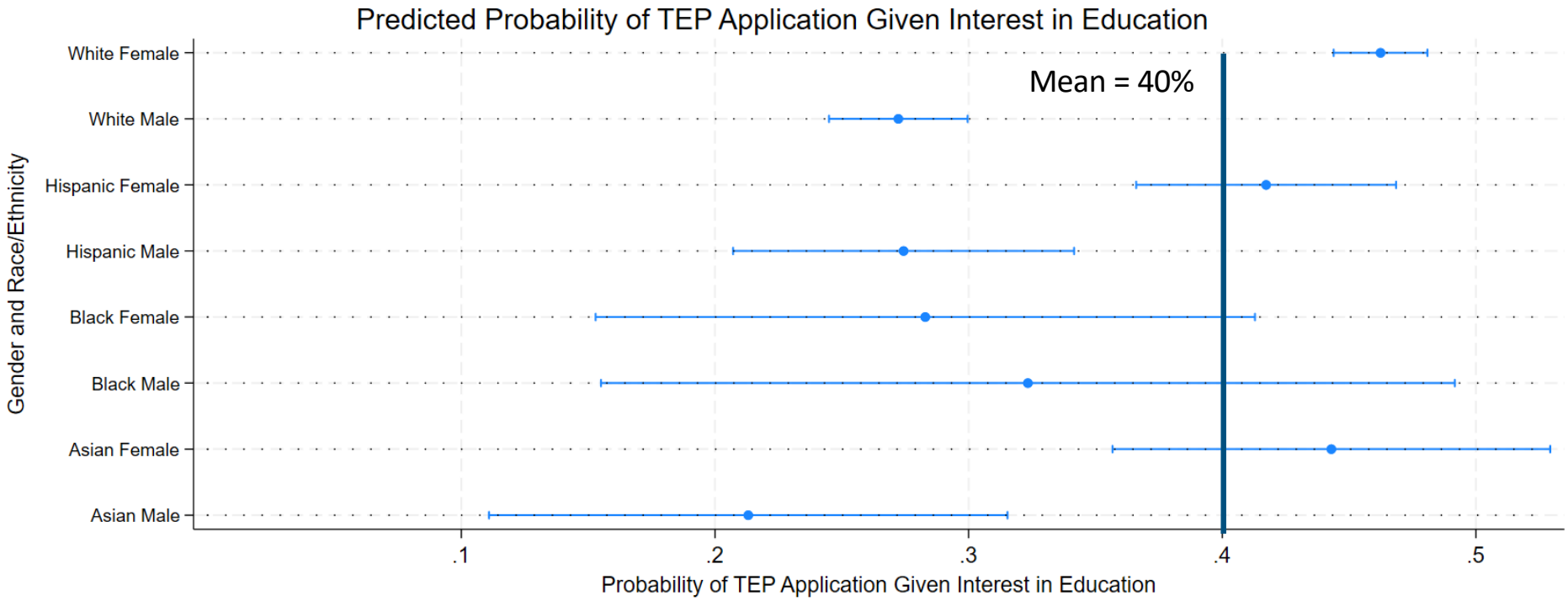
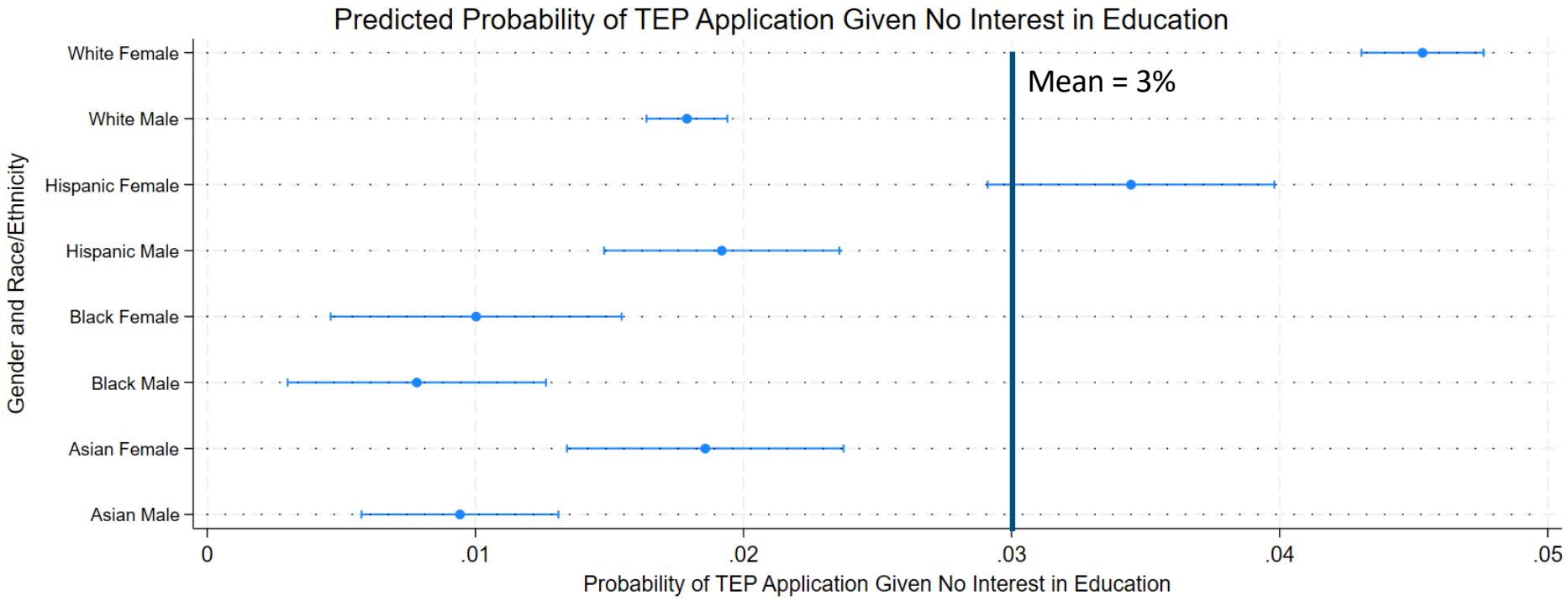
Research Questions

1. What pre-college characteristics (gender, race/ethnicity, and SAT scores) predict *interest* in education at time of university application?
2. **What pre-college and college coursetaking variables (e.g., GPA, # of STEM courses) predict *applying* to a TEP?**

Predicted Probabilities of TEP Application *Given Education Interest* by Student Gender and Race/Ethnicity



Predicted Probabilities of TEP Application GIVEN NO EDUCATION INTEREST by Student Gender and Race/Ethnicity



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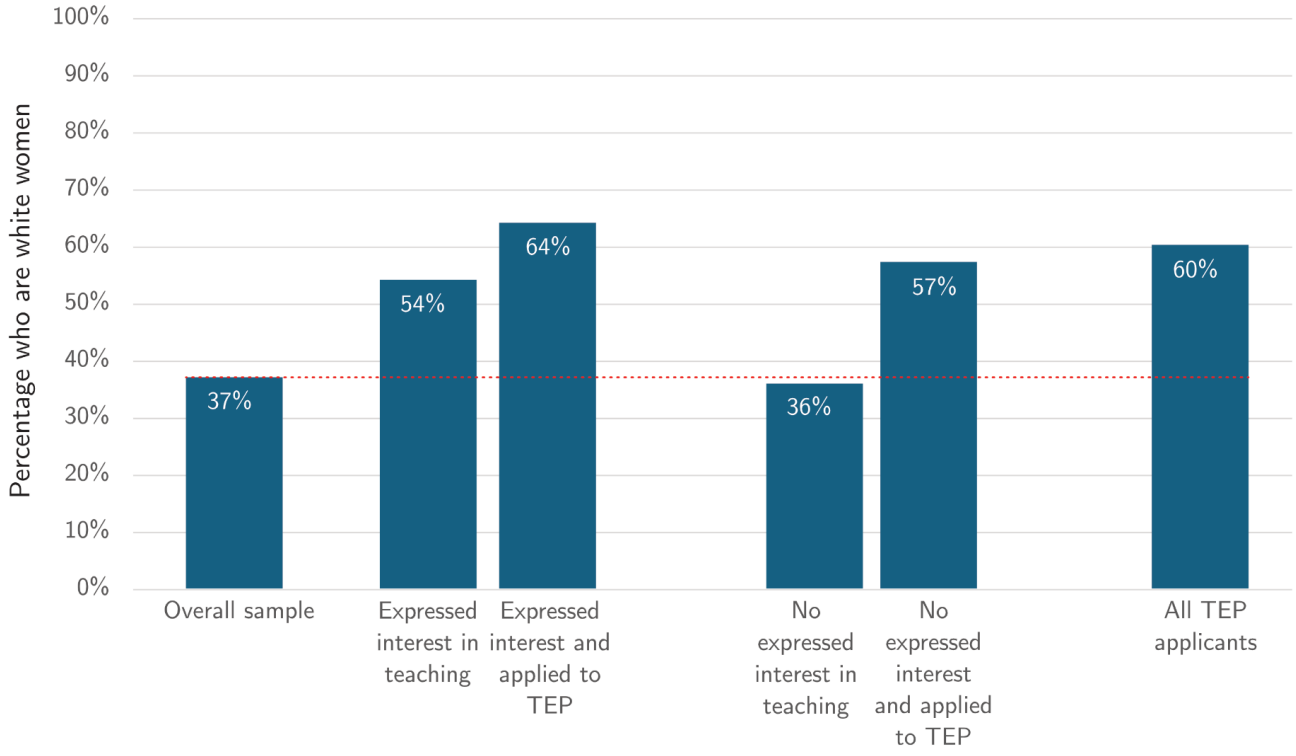
White Women Pursuing Teaching Become More Common Through College



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Other Findings

- If they enter with an interest in education, transfer students are more likely than traditional students to apply to a TEP.
- Overall university GPA is positively associated with applying to TEPs, especially for those starting with an interest in education.
- Taking a Gateway course in a students' non-education interest does not predict applying to a TEP, nor does the grade earned by that student in the Gateway course.

Discussion and Conclusions

- Significant amount of switching in and out of the "early teacher pipeline" – i.e., when students enter a university and identify (or don't) an interest in teaching and when they apply (or don't) to a TEP
  - Only 40% of students who said they were interested in education at the time of university application applied to a TEP & only 45% of students who applied to TEPs at these universities said they were interested in education at the time they initially applied to the university
  - Suggests that there may be considerable scope for changing the composition of the teacher pipeline after students are in college
- Large disparities in initial interest by SAT (and minimal sorting by SAT into TEPs conditional on interest) imply efforts to improve the academic caliber of the teacher workforce likely require starting earlier than the point of university application

Contact and Paper

- John Krieg: John.Krieg@wwu.edu
- Paper:

Method or Measure? Investigating the Teacher Learning Curve Across Multiple Student Outcomes

Ben Backes, James Cowan, Dan Goldhaber, Roddy Theobald

CALDER Conference | March 2nd, 2026

The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305S210012 to American Institutes for Research (AIR). The opinions expressed are those of the authors and do not represent the views of the Institute, the U.S. Department of Education, or the Massachusetts Department of Elementary and Secondary Education.

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Motivation

- Previous literature estimating impacts on test scores find that the majority of improvement occurs in the first 3-5 years of teaching (Papay & Kraft, 2015; Kini & Podolsky, 2016).
- Early-career improvement can be replicated as measured by rubric-based classroom observation scores (Bell et al., 2023; Kraft et al., 2020).
- A handful of studies have also found that students with more experienced teachers tend to improve other outcomes:
  - Gershenson (2016) elementary school teachers reduce student absences
  - Ladd & Sorenson (2017) middle school teachers reduce number of students with high absenteeism, less clear evidence for reported offenses
  - Jackson (2018) no relation between years of experience and nontest outcomes for high school teachers
  - All of the above papers from the same state (North Carolina)

Contributions

1. Estimate returns to experience across a variety of nontest outcomes
   - Teacher pay structures reward experience — but how much does experience actually improve student outcomes?
   - Improvements in nontest outcomes with experience would suggest that these outcomes reflect skills teachers can strengthen over time (or be taught?)
2. Robustness of returns to nontest experience across models
   - Explain inconsistency of prior evidence

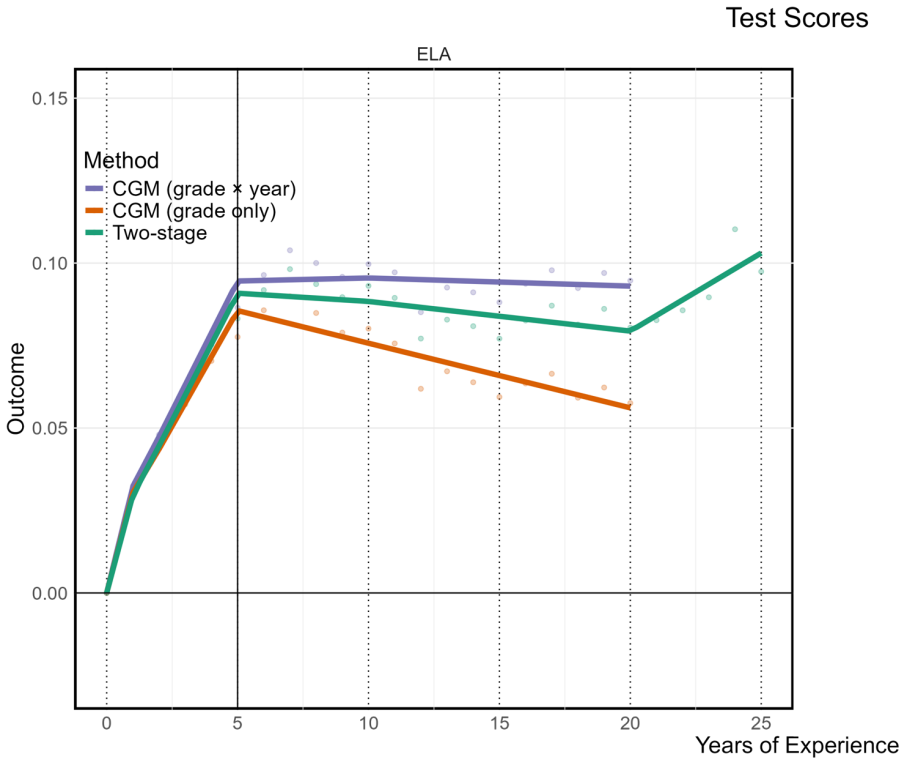
Estimating Returns to Experience

- Age-period-cohort problem:
  - Collinearity: [School Year] = [Experience] + [Entering Cohort Year]
  - Need to make assumptions to separately identify all three terms
- **Approach 1**: Censored Growth Model (CGM). Assumes no returns to experience after some number of years (typically 10)
- **Approach 2**: Censored Growth Model (CGM) with no year effects. Biased if there really are year-by-year shocks (e.g., a change in accountability regime, pandemic, etc.)
- **Approach 3** (Papay & Kraft, 2015): Two-Stage Model. Assumes that initial teacher effectiveness stable over time
- In all approaches:
  - Include teacher fixed effects to avoid bias associated with teacher attrition
  - Control for student demographics and prior outcomes to account for student-teacher sorting

Data

- Math and English teachers in Massachusetts in Grades 3-8 and 10 between the 2012-2013 and 2016-17 school years
- Use earlier data to avoid pandemic and make stable cohort assumption more plausible
- Outcomes (all standardized mean 0, sd 1 at student level):
  - Test scores (math and ELA)
  - Nontest measures:
    - Attendance
    - Discipline
    - Grades
  - Educator Evaluation Ratings
- Measuring experience:
  - Option 1: Years since hire date
  - Option 2: Count years observed in staff file working as a teacher
  - Exclude teachers who entered on temporary license (license for experienced teachers coming from out of state)

Test Scores



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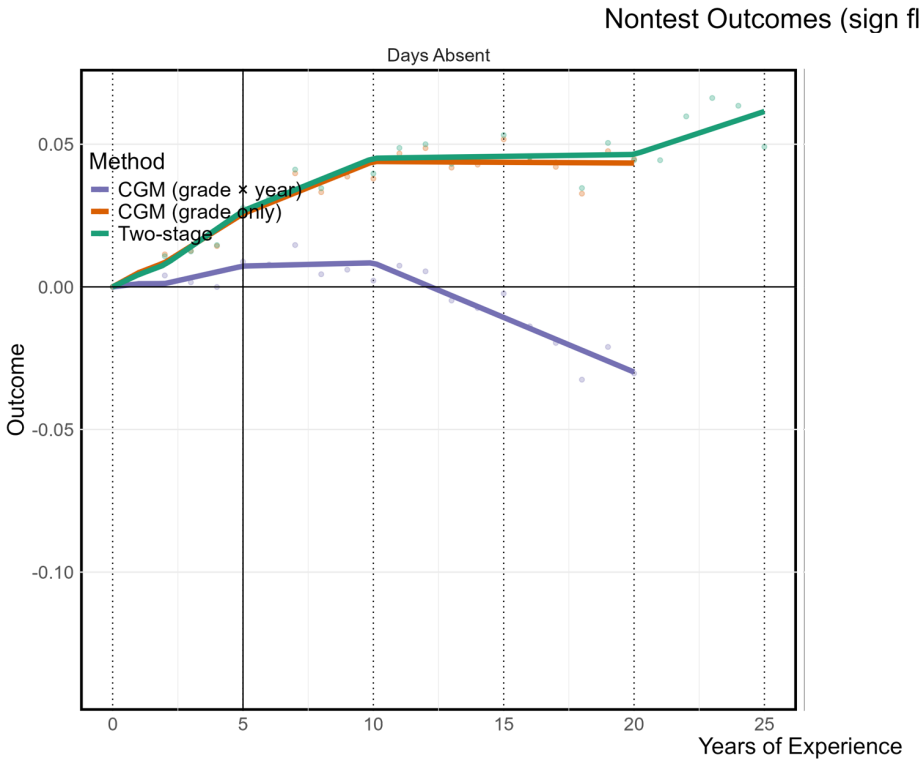
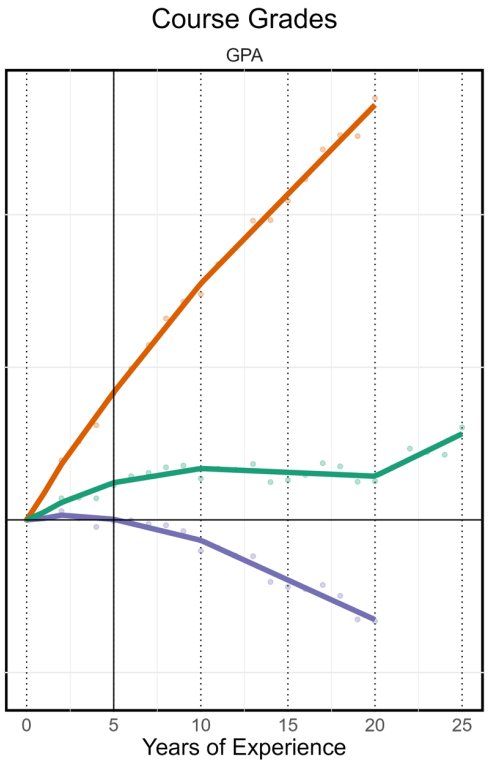
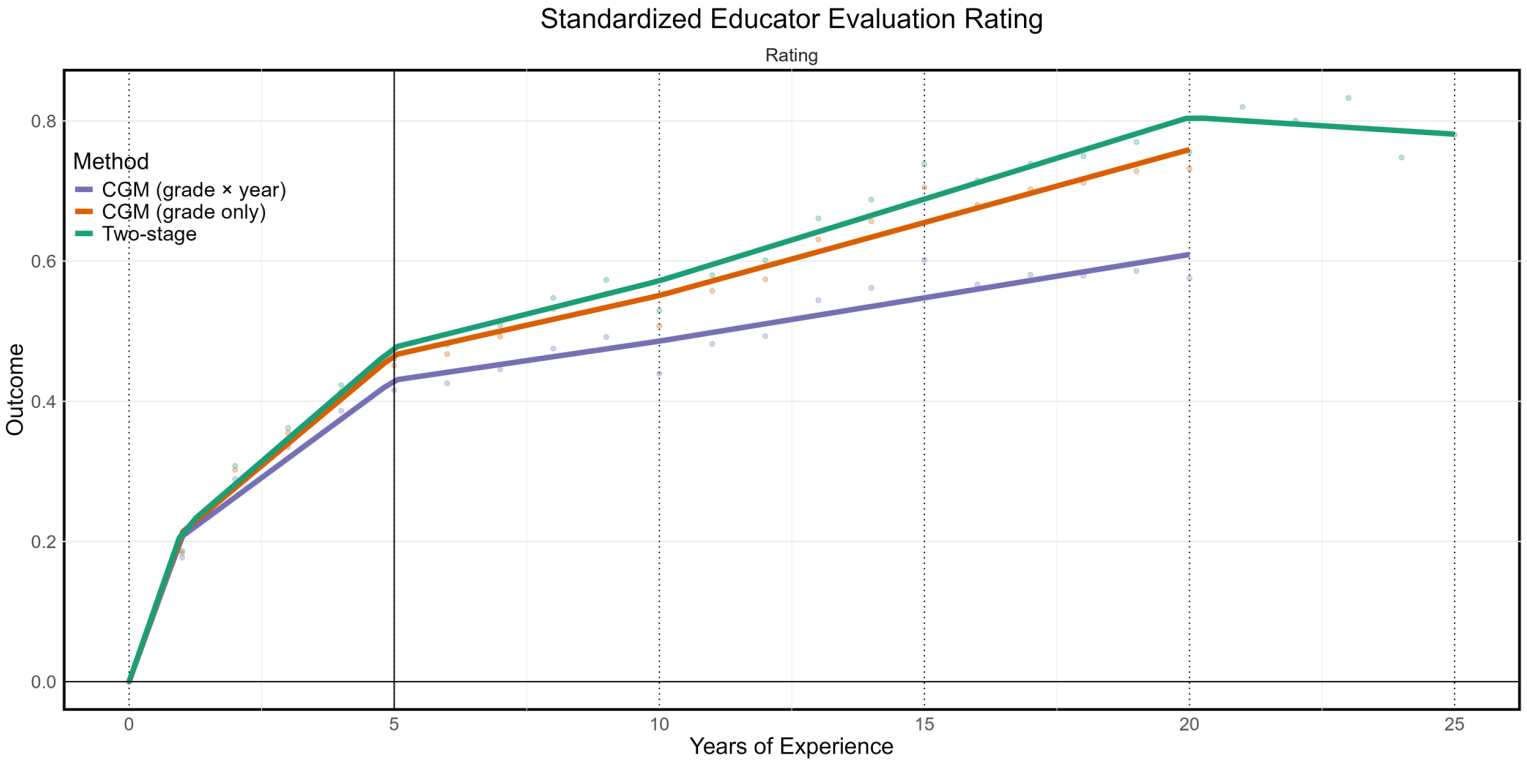
Nontest Outcomes



Course Grade Outcomes

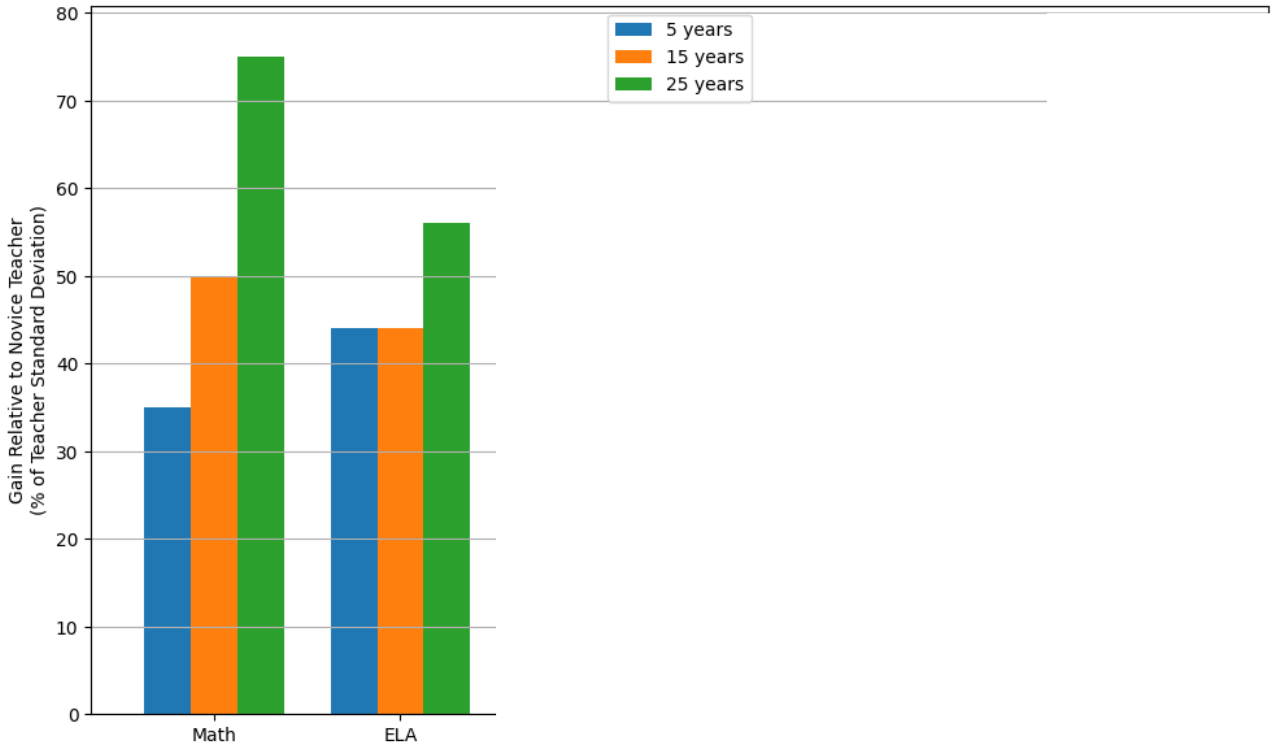


Evaluation Ratings



Strong evidence of career-long improvement.

Teacher Effectiveness Rises with Experience Across Both Test and Nontest Outcomes



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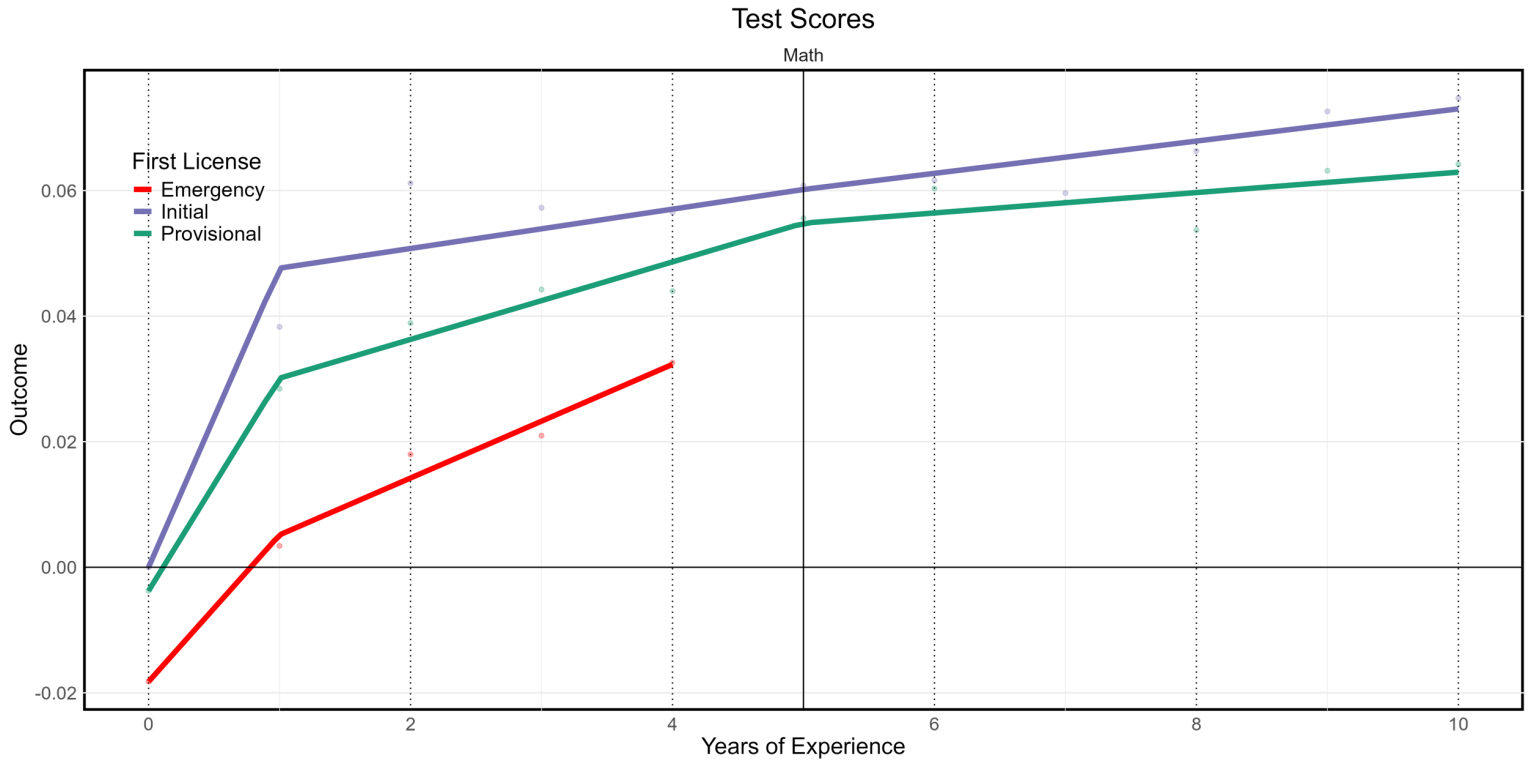
MA Licensure Context

- We categorize teachers into three entry routes based on the first license earned in Massachusetts:

Initial License (Traditional)	Provisional License (Alternative)	Emergency License (response to COVID-19) Offered 2020 – Nov 2023
Bachelor's Degree	Bachelor's Degree	Bachelor's Degree
Pass relevant MTELs (state licensure exams)	Pass relevant MTELs	
State-approved educator preparation program		
Supervised practicum (teaching in a classroom)		

Effectiveness by Experience and Pathway



ELA: All three entry routes have similar experience profiles

Math: Emergency license starts lower and does not appear to catch up

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Conclusion

- Very consistent patterns for nearly all outcomes:
  - Teachers improve rapidly for the first five years and then more slowly afterwards
- Experience profiles steepest for test scores and evaluation ratings
- Teachers from an entry route with lower initial effectiveness do not appear to close the gap as they gain experience (in math)
- Further evidence of difficulties for disadvantaged schools: for example, students susceptible to chronic absence and inexperienced teachers concentrated in same schools

School System Selection Processes and Workforce Diversity In Schools

Dan Goldhaber, Cyrus Grout, Constance A. Lindsay, Elton Mykerezi, Aaron Sojourner

Thank you Joyce Foundation!

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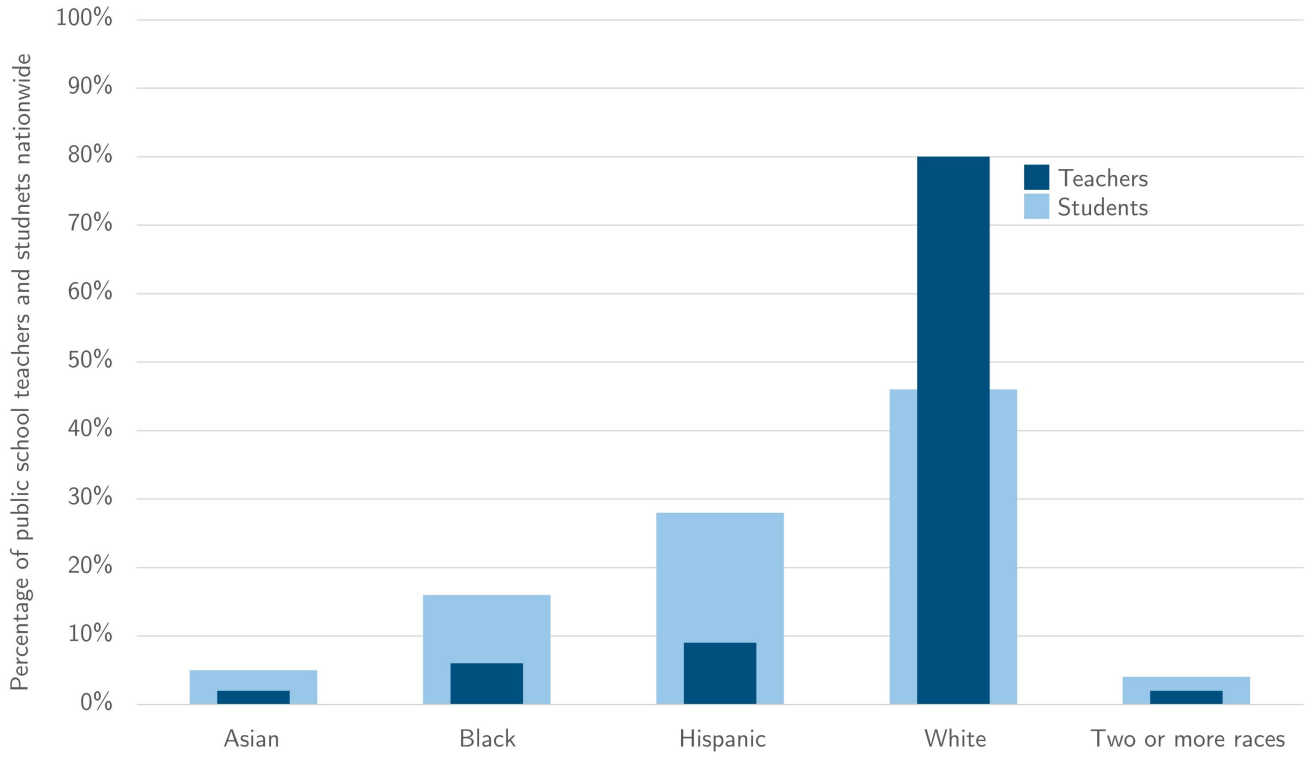
The Racial and Ethnic Composition of the K-12 Teacher Workforce Does Not Reflect the Diversity of the Student Population

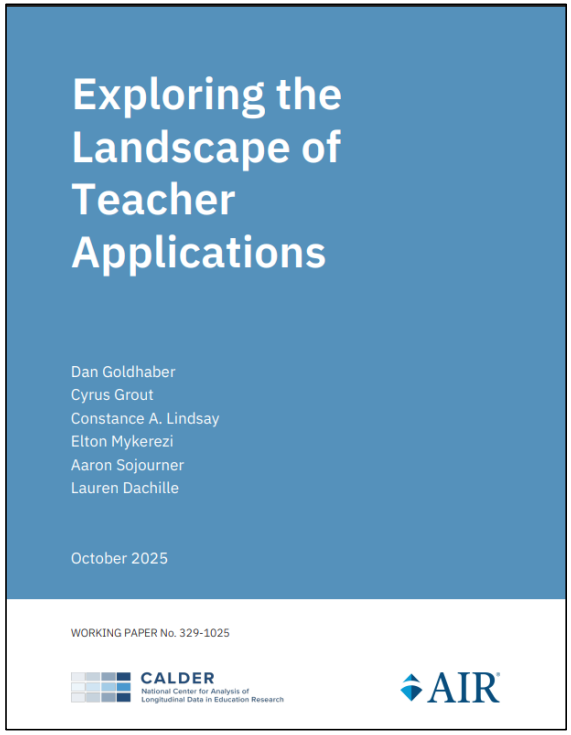


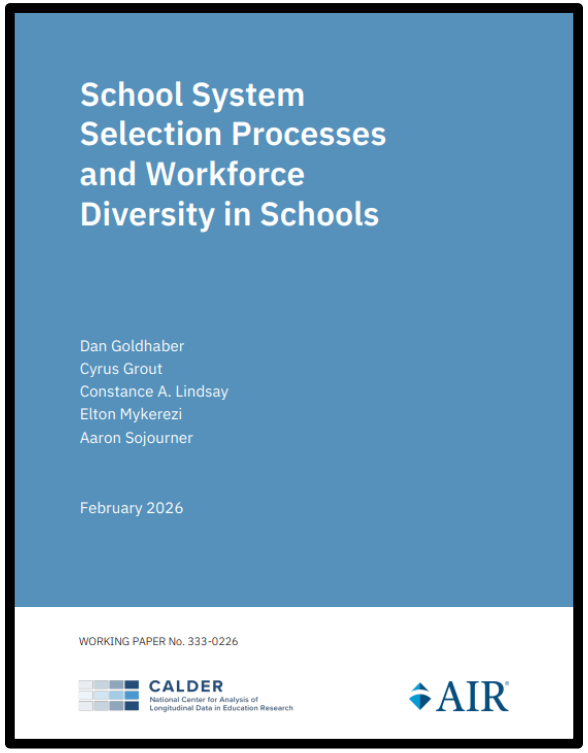
SOURCE: **U.S. Department of Education, National Center for Education Statistics**, National Teacher and Principal Survey, Public School Teacher Data File," 2020-21; and Common Core of Data, "State Nonfiscal Survey of Public Elementary and Secondary Education," 2020-21. See Digest of Education Statistics 2022, tables 203.65 and 209.22.

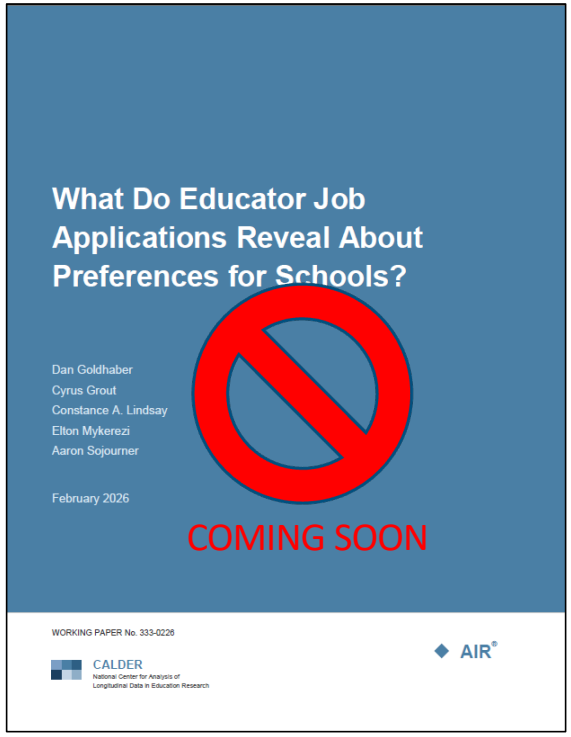
Background on Demographic Match

- Students of color benefit academically and behaviorally from having same-race teachers
  - Dee (2004) found same-race teacher assignment improved math and reading achievement by 3–4 percentile points in Tennessee's Project STAR
  - Egalite (2024) reviewed 12 quasi-experimental studies: ~half showed positive, statistically significant effects for Black students in math (effect sizes 0.02–0.13 SD
  - Same-race teachers also affect longer-run outcomes (e.g., graduation, college-going) and non-academic outcomes like attendance and discipline (Grissom & Redding, 2016; Gershenson, 2017; Tran & Gershenson, 2021; Gershenson et al., 2022)
- *Rhetoric* and efforts to increase educator diversity
  - Federal, state, and local investments have supported alternative certification, grow-your-own pipelines, and recruitment at HBCUs and minority-serving institutions
  - But what was once a policy consensus — greater educator diversity — has recently become contested, with federal executive orders and legal challenges targeting diversity-focused initiatives
- You only become a teacher if you're hired! A gap in the literature
  - Resume audit experiments document bias in early hiring stages (Bertrand & Mullainathan, 2004; Kline et al., 2024)
  - Despite its importance, the role of the hiring process in shaping educator workforce diversity is largely unexplored

Research from This Project







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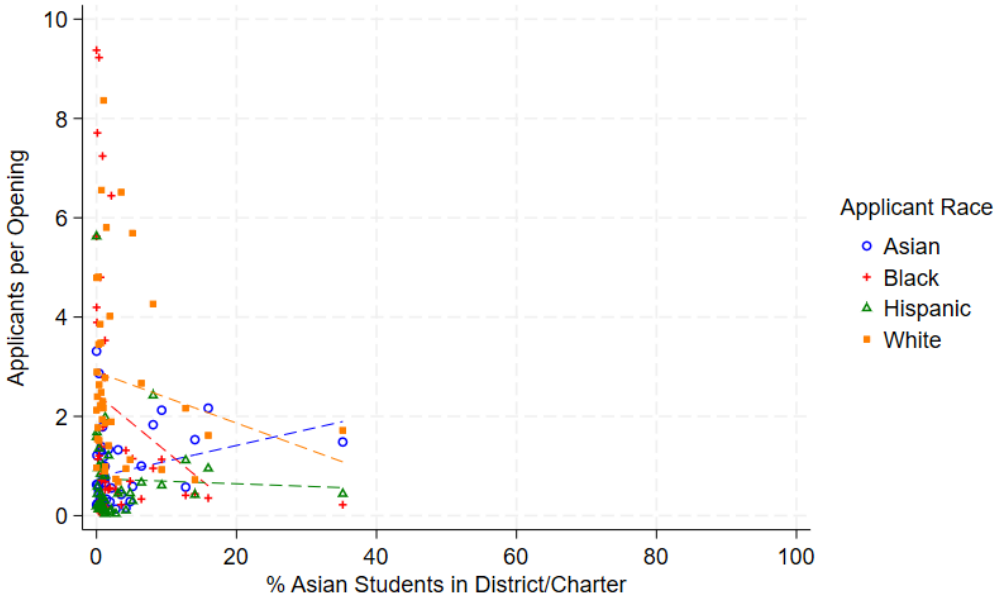
Quick Questions and Answers

1. How does the racial composition of applicants change as candidates advance through the hiring process for teachers?
   - Black, Hispanic, and Asian applicants all significantly less likely than White applicants to have their applications advanced out of "central office" to school-level personnel
   - Black and Asian applicants less likely than White applicants to be engaged by school-level personnel (e.g., for an interview)
   - Asian applicants are significantly less likely than any other group to advance at each stage of the hiring process

2. Do advancement patterns vary across organizations with different characteristics, such as student demographics?
   - Black applicants are more likely to receive an offer when applying to a charter organization versus a school district
   - Black and Hispanic applicants are more likely to receive an offer when apply to organizations serving a high percentage of under represented minority (URM) students versus those serving a low percentage of URM students

Applicant Pools Differ Across Organizations

- The Nimble applicant pool is **more racially diverse** than the national teacher workforce — only 41% of teacher applicants identify as White, compared to ~74–80% of the teacher workforce
  - Asian: 14%
  - Black: 20%
  - Hispanic: 11%



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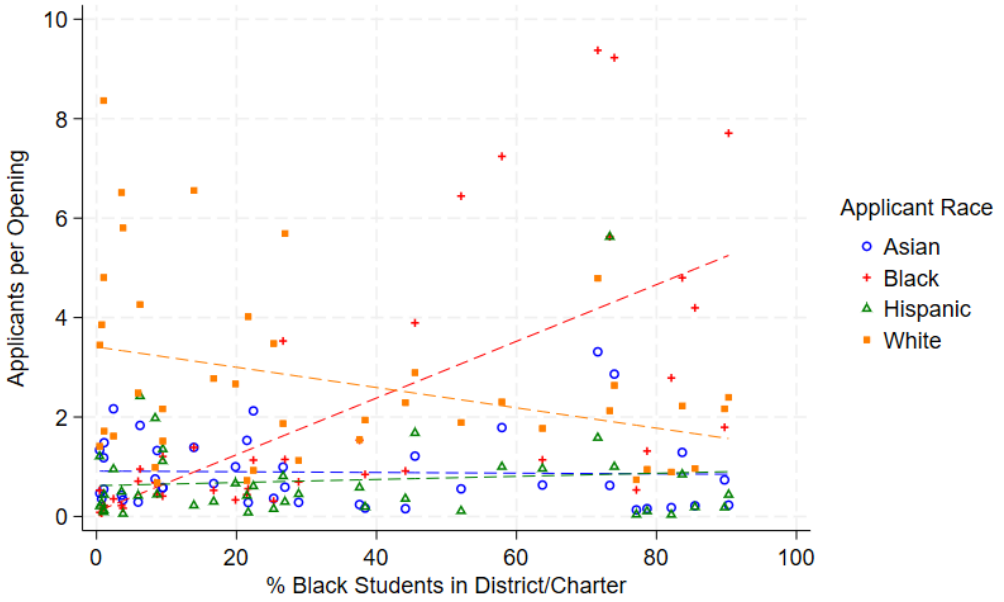

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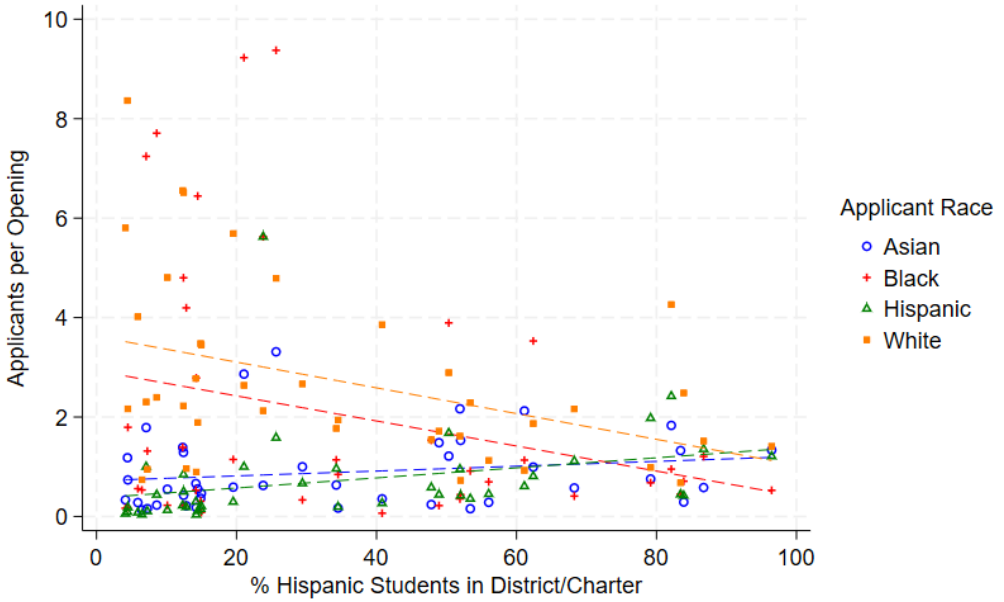

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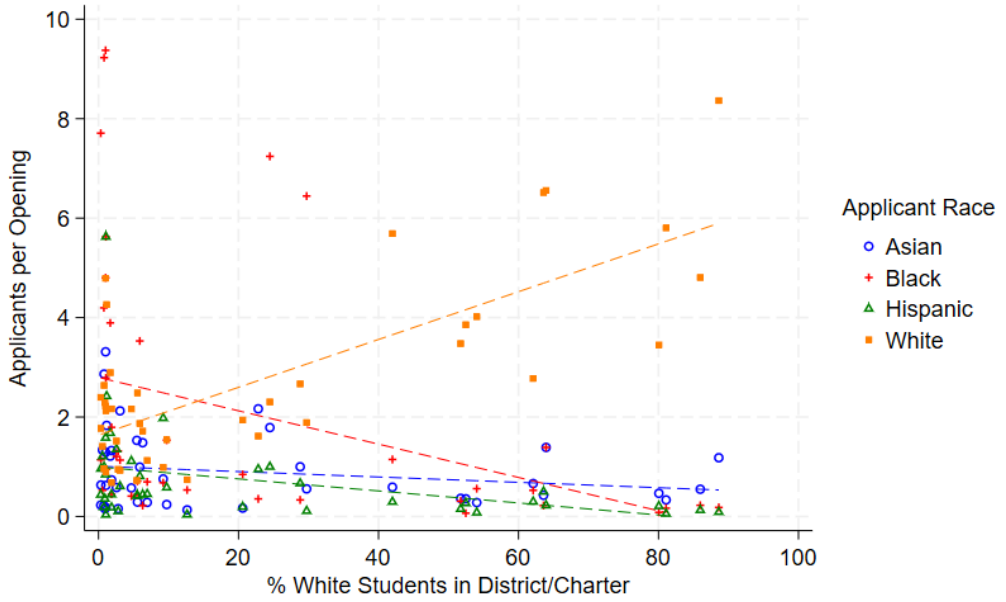

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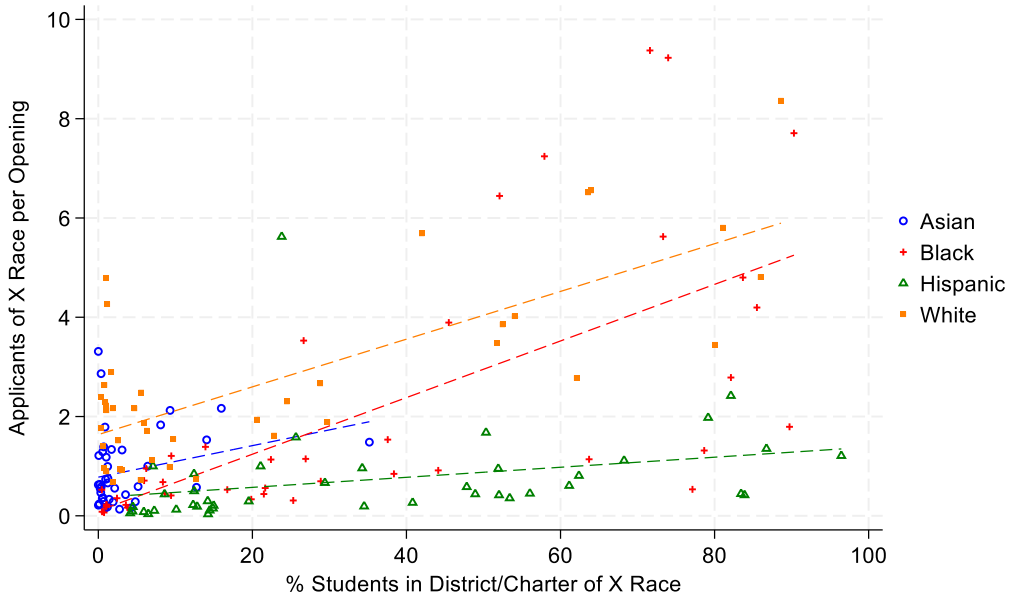
  - Black: 20%
  - Hispanic: 11%
- Applicant and student-body demographics are positively correlated for all races
- But stronger relationships for Black and White applicants/students



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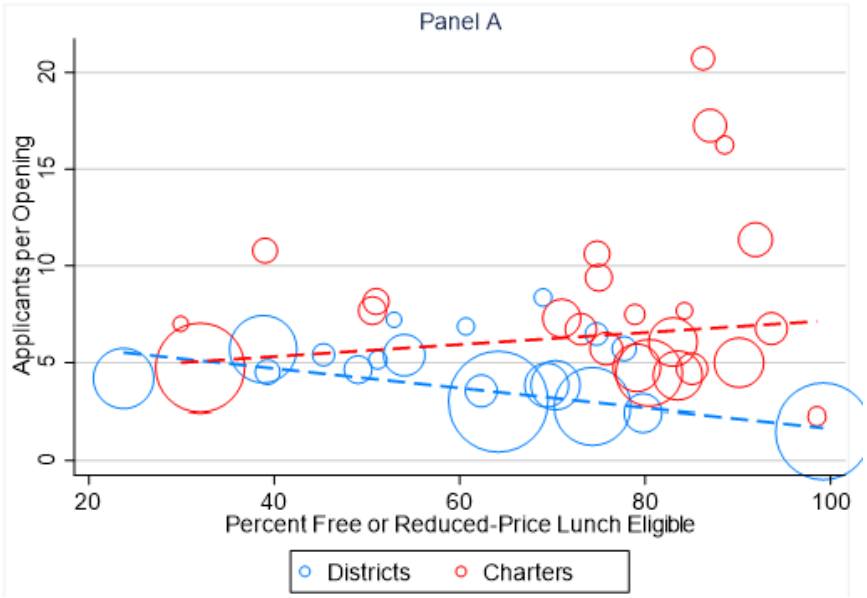
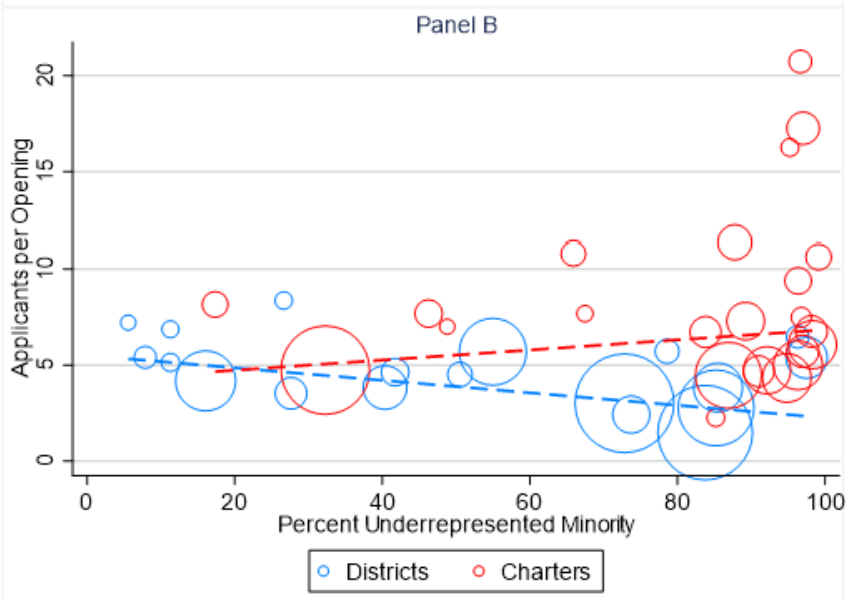
Variation Across Organizations in Applicant Supply

Unique Applicants per Opening by FRL%



Unique Applicants per Opening by URM%



SOURCE: Dan Goldhaber, Cyrus Grout, Constance A. Lindsay, Elton Mykerezi, Aaron Sojourner, Lauren Dachille (2025). Exploring the Landscape of Teacher Applications. CALDER Working Paper No. 329-1025. https://doi.org/10.63302/QUGK9912

Data and Analytic Sample for this Study

- Data sources
  - Primary data come from **Nimble PBC**, an applicant tracking system (ATS) used by K-12 educational institutions to manage hiring from job posting through onboarding for the calendar years 2019 to 2024
  - Study focuses exclusively on **public K-12 institutions** that are paying clients of Nimble, ensuring consistent use of the platform
  - **Common Core of Data (CCD)** records to add organizational-level information on student demographics, free/reduced lunch eligibility, enrollment size, and student-to-teacher ratios
- Defining the analytic sample
  - The sample covers **teacher** job postings, identified using ONET codes (beginning with "25-") plus job title text
- Sample size
  - **42 organizations** (18 public school districts + 24 charter organizations), **16 states**.
  - **3,152 job postings**, 10,545 openings, and nearly 70,000 applications from 46,130 unique applicants (~4.4 applicants per opening)

How Applicant Characteristics Vary By Race/Ethnicity

	Asian	Black	Hispanic	White	Other
Female	0.74	0.66	0.67	0.68	0.65
Advance Degree	0.64	0.44	0.36	0.38	0.27
Has Prior Experience	0.71	0.60	0.65	0.71	0.48
NCI Performance Score	0.49	-0.09	-0.05	-0.08	-0.06
NCI Turnover Score	0.09	-0.02	0.00	0.03	-0.22

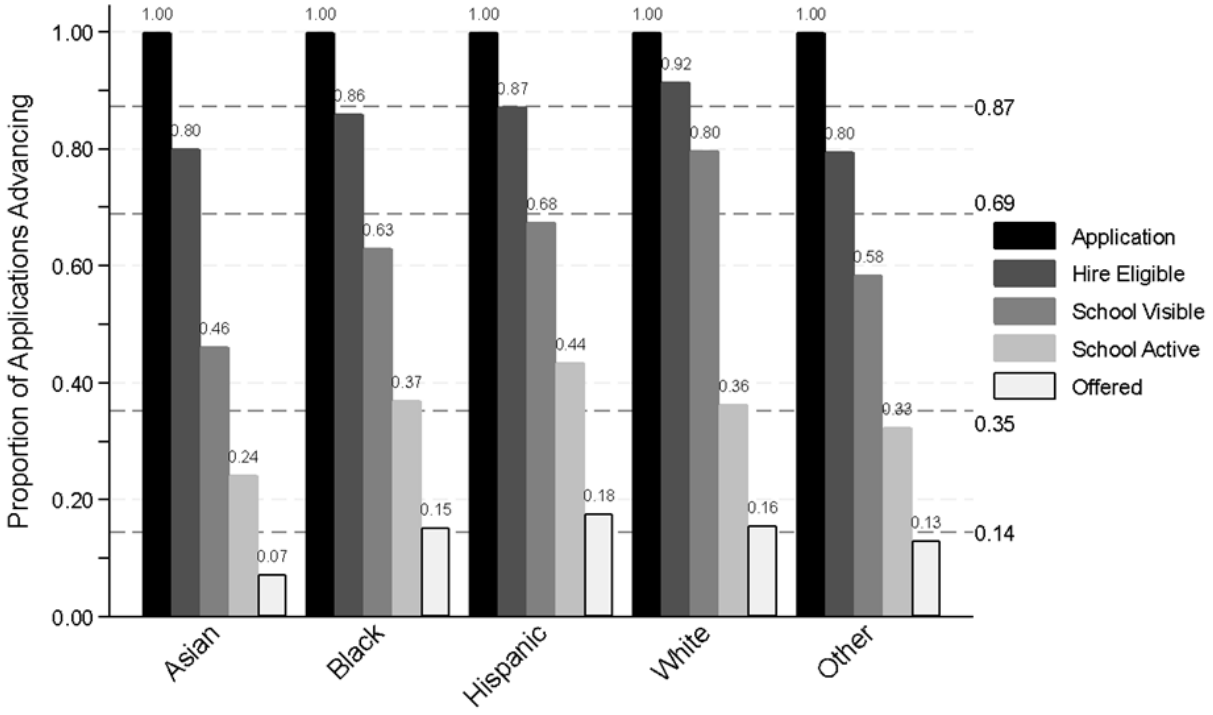
Characterizing the Hiring Process

- We standardize the hiring process across four stages
  1) Central office screening for eligibility to hire (*Hiring Eligible*) – e.g., making sure applicants meet minimum qualifications
  2) Central office makes candidate profile visible to hiring principal (*School Visible*) – e.g., central offices factoring in additional criteria such as work history to determine whether schools see an applicant
  3) School principal or designees decide to actively engage with the candidate such as via an interview (*School Active*) – e.g., principals review candidate resumes and letters of recommendation to choose who to invite to interview
  4) Principal offers candidate the job (*Offered*)

- If an applicant reaches a given stage, they are assumed to have satisfied all preceding thresholds (even if not recorded in the system)

- Importantly, organizations are *not* provided information about applicant race/ethnicity

Progression to Stages of the Hiring Process: Averages by Applicant Race/Ethnicity



- White applicants more likely to advance in early stages of hiring process
- Similar proportions of applications from Black, Hispanic, and White applicants result in an offer (0.15 to 0.18)
- Asian applicants are much less likely to advance at each stage of the process
- Patterns may reflect differences across organizations in degree centralization and variation in the level of competition, combined with applicant pool demographics

Methods

- Modeling approach
  - The core question for each stage is: does an applicant's race/ethnicity predict whether they advance to the next stage, conditional on having reached the prior stage?
  - Each stage is modeled separately as a **linear probability model** — estimating the probability that an application advances, as a function of the applicant's race/ethnicity *and a set of controls (including measures of applicant quality)*
- Controls and fixed effects
  - Applicant-level controls include: gender, having prior teaching experience, holding an advanced degree, and Nimble's algorithmic measures of predicted effectiveness and predicted retention
    - » The ATS collects a detailed work history for each candidate that records highest degree, job titles, descriptions, timelines and reasons for separating from each prior job.
    - » Nimble aggregates this information into two distinct "Nimble Candidate Insight" (NCI) scores to assist decision-makers in aggregating candidate information efficiently
  - Competition for each job at each stage is controlled for by accounting for the number of competing applicants per opening
  - Four specifications are estimated: **baseline** (demographics, year fixed effects only), with **applicant characteristics and competition**, with ***organization* fixed effects,** or with **job fixed effects** — the job fixed effects specification is preferred because it compares applicants competing directly for the same position
    - » Standard errors are clustered at the applicant and job levels to account for applicants applying to multiple jobs and job-level differences in hiring practices

Predicting the Probability that an Application Results in an *Offer*

	(1)	(2)	(3)	(4)
Asian	-0.085***	-0.095***	-0.122***	-0.137***
	(0.007)	(0.010)	(0.008)	(0.007)
Black	-0.001	-0.005	-0.023***	-0.030***
	(0.007)	(0.007)	(0.007)	(0.007)
Hispanic	0.019**	0.017**	0.002	0.008
	(0.008)	(0.008)	(0.007)	(0.007)
White	Ref.	Ref.	Ref.	Ref.
	-	-	-	-
Other	-0.017***	-0.013**	-0.027***	-0.032***
	(0.006)	(0.006)	(0.006)	(0.006)
Female	0.016***	0.016***	0.023***	0.022***
	(0.004)	(0.004)	(0.004)	(0.004)
Job Competition		-0.004***	-0.003***	
		(0.001)	(0.001)	
Prior Tch. Exp.		0.020***	0.025***	0.028***
		(0.004)	(0.004)	(0.004)
Adv. Degree		0.025***	0.021***	0.016***
		(0.005)	(0.005)	(0.004)
Nimble Predicted Effectiveness		-0.029***	-0.041***	-0.038***
		(0.009)	(0.008)	(0.008)
Nimble Predicted Retention		0.086***	0.097***	0.089***
		(0.010)	(0.009)	(0.008)
Fixed Effect	None	None	Org.	Job
Observations	66,931	66,931	66,931	66,931

Predicting Advancement to Each Stage Conditional on Reaching Prior Stage

	Hiring Eligible (1)	School Visible (2)	School Active (3)	Offered (4)
Asian	-0.096***	-0.165***	-0.168***	-0.148***
	(0.008)	(0.013)	(0.014)	(0.020)
Black	-0.033***	-0.036***	-0.023***	-0.016
	(0.005)	(0.007)	(0.008)	(0.012)
Hispanic	-0.008	-0.030***	0.015	0.028**
	(0.006)	(0.008)	(0.010)	(0.012)
White	Ref.	Ref.	Ref.	Ref.
	-	-	-	-
Other	-0.073***	-0.025***	-0.015*	-0.018
	(0.006)	(0.006)	(0.008)	(0.011)
Female	0.015***	0.017***	0.016***	0.028***
	(0.004)			
		(0.004)	(0.006)	(0.008)
Job FE	Y	Y	Y	Y
Observations	66,931	58,743	46,245	22,742
R-Squared	0.250	0.496	0.427	0.295
Baseline pr(advancement)	0.87	0.79	0.51	0.42

Patterns of Advancement Vary According to Organization Type and Student Demographics

- We compare patterns of advancement in districts vs. charter organizations
  - Black and "Other" applicants are significantly (3pp to 4pp) more likely to receive an offer in charters vs. districts
  - In charter organizations both groups are similarly likely to receive an offer as White applicants

- To examine whether patterns vary student demographics, we characterize each organization as *High URM* (in the top quartile nationally) or *Low URM* (not in the top quartile)
  - 8/18 districts and 18/24 charters in our study are *High URM*
  - Black (+7pp), Hispanic (+3pp), and "Other" (+3pp) applicants are significantly more likely to result in an offer in *High URM* organizations
  - In *High URM* organizations, Black and Hispanic applicants are similarly likely to receive an offer as White applicants

Concluding Thoughts

- We do not find evidence that organizations are using hiring decisions to increase workforce diversity
  - Asian, Black, and Other applicants are significantly less likely to advance in the first three stages
  - Asian applicants face the steepest disadvantage, with a cumulative offer probability of just 5% compared to an overall rate of 14% — significantly lower than every other racial/ethnic group
  - Disparities are larger in districts than in charters

- Disparities are concentrated in the **earlier, resume-based stages** of hiring (the *Hiring Eligible* and *School Visible/Active* transitions), before any in-person interaction
  - Recall that race/ethnicity is not reported to organizations *directly*

- Caution!

Session III: Evidence on Who Becomes a Teacher: Selection Across the Preparation and Hiring Pipelines

Discussant

- **Sara DeLano,** Dean, Educator Pathways, School of Education, Dallas College

Paper Presentations

- **The Beginning of the Teacher Pipeline: Which College Students Apply to Teacher Education Programs?** John Krieg, Western Washington University
- **Alternative Pathways in Massachusetts.** Ben Backes, CALDER/AIR
- **Probability of Advancing Through the Hiring Pipeline.** Dan Goldhaber, CALDER/AIR

Session IV: What's Next?
Roundtable Discussion on Education Research and Policy

Panelists

- **Cara Jackson**, Research Manager, The Center for Outcomes Based Contracting at the Southern Education Foundation
- **Nat Malkus**, Senior Fellow and Deputy Director, Education Policy Studies, AEI
- **Amber Northern**, Senior Advisory, Office of the Secretary, U.S. Department of Education

Moderator

- **Dan Goldhaber,** CALDER/AIR

That’s a Wrap. Thank You!

Slides will be posted at **caldercenter.org**

Catch more CALDER research at **AEFP in Chicago March 19-21**.

Webinar on April 22: The Four-Day-School Week: New Evidence for District Leaders & Policymakers

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