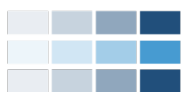


The Decline in Teacher Working Conditions During and After the COVID Pandemic

Sofia P. Baker
Cory Koedel

March 2025

WORKING PAPER No. 314-0325



CALDER

National Center for Analysis of
Longitudinal Data in Education Research



The Decline in Teacher Working Conditions During and After the Pandemic

Sofia P. Baker

University of Missouri

Cory Koedel

University of Missouri / CALDER

Contents

Contents.....	i
Acknowledgments	ii
Abstract	iii
1. Introduction	1
2. Background.....	3
3. Data & Methods	7
4. Results	18
5. Summary and Conclusion.....	23
References	26
Tables and Figures.....	29
Appendix A. Data Adjustments and Exploration	36
Appendix B. List of Items in Each 5E Survey Measure.....	38
Appendix C. Supplementary Tables.....	42

Acknowledgments

Baker is in the Department of Economics at the University of Missouri and Koedel is in the Department of Economics and Truman School of Government and Public Affairs at the University of Missouri. We thank Paul Bruno for directing us to the 5Essentials Survey dataset for this project, and Holly Hart and Chris Young at the University of Chicago Consortium on School Research for helping us with data questions.

CALDER working papers have not undergone final formal review and should be cited as working papers. They are intended to encourage discussion and suggestions for revision before final publication. Any opinions, findings, and conclusions expressed in these papers are those of the authors and do not necessarily reflect the views of our funders or the institutions to which the authors are affiliated. Any errors are attributable to the authors.

CALDER • American Institutes for Research
1400 Crystal Drive 10th Floor, Arlington, VA 22202
202-403-5796 • www.caldercenter.org

The Decline in Teacher Working Conditions During and After the COVID Pandemic

Sofia P. Baker & Cory Koedel

CALDER Working Paper No. 314-0325

March 2025

Abstract

We study changes to teacher working conditions from 2016-17 to 2022-23, covering school years before, during, and after the COVID pandemic. We show working conditions were improving leading into the pandemic but declined when the pandemic arrived. Perhaps more surprisingly, the peak of the pandemic was not a low point for teacher working conditions, which have continued to decline during the post-pandemic period. Teachers report worsening working conditions along many dimensions including the level of classroom disruptions, student responsibility, and safety, among others. They also report declines in trust between themselves and principals, parents, and other teachers. Trends in working conditions since the pandemic are similar in schools serving more and less socioeconomically advantaged students. However, schools in districts where online learning was the predominant mode of instruction during the 2020-21 school year have experienced larger declines than other schools.

1. Introduction

Teacher working conditions are highly correlated with job satisfaction, intentions to remain in the profession, and turnover (Geiger and Pivovarova, 2018; Kraft, Marinell, and Shen-Wei Yee, 2016; Redding and Nguyen, 2024; Simon and Johnson, 2015), and teachers often report valuing working conditions over other important aspects of their jobs, including their salaries and the socioeconomic status of their students (Horng, 2009; Johnson, Kraft, and Papay, 2012). The COVID pandemic brought unprecedented and abrupt changes to schools, but little is known about how teacher working conditions changed. We contribute to the literature by providing new evidence on trends in teacher working conditions before, during, and after the COVID pandemic.

When the pandemic began in March of 2020, most schools closed and remained closed for the remainder of the 2019-20 school year. In 2020-21, schools operated in an uncertain environment and used different modes of instruction, often switching between in-person, hybrid, and fully remote learning during the school year (Goldhaber et al., 2023; Jack and Oster, 2023). Due to the abrupt nature of COVID's arrival, the changes to school operations happened without advanced warning, causing a myriad of issues. For instance, teachers were not provided adequate technological or pedagogical training to support the transition to online teaching and students did not always have access to the technology necessary to switch between learning modes. On top of the stress caused by the health and social effects of COVID-19, it was a demanding period for teachers professionally (Kraft, Simon, and Lyon, 2021).

Other changes also occurred that affected schools at the same time, some related to COVID-19, and others unrelated. An example of a related change is a decline in academic standards brought on by concerns about students' mental health (Jacob, 2024). Standards have recovered some since the pandemic, but have not fully rebounded (Goldhaber and Young, 2024;

Lemov, 2024; Sanchez, 2023). Student enrollment and attendance also dropped during the pandemic and have yet to return to their pre-pandemic levels (Dee, 2024; Goulas and Pula, 2024). The world outside of schools also changed in important ways, including the murder of George Floyd in May of 2020, which created widespread social unrest and likely affected school environments in complex ways. In addition, the labor market tightened coming out of the pandemic, leading to increases in occupational mobility and staffing shortages economywide, including in the education sector.

In the context of this period of change, we document trends in teachers' self-reported working conditions using data from the 5Essentials Survey in Illinois (hereafter, the 5E Survey). The 5E Survey is a rich survey covering many aspects of the conditions in schools and has been administered to teachers and students annually in Illinois for many years. We document trends in teacher working conditions from 2016-17 to 2022-23, and further split our sample to examine trends prior to the pandemic (2016-17 to 2018-19), during the pandemic (2018-19 to 2020-21), and after the pandemic (2020-21 to 2022-23).¹

We find teacher working conditions declined substantially over the full period we study, and that the decline was concentrated during and after the pandemic, from 2018-19 to 2022-23. During this span, just 2 of 20 working-condition indicators on the 5E Survey showed improvement. Of the indicators that trended negatively, many imply precipitous declines. Teachers report worsening conditions along dimensions including safety, student responsibility and disruptiveness, and instructional leadership, among others. They also report declines in trust with principals, parents, and other teachers. The declines in teacher working conditions along

¹ Though the U.S. Centers for Disease Control and Prevention (CDC) did not declare the pandemic to have ended officially until May of 2023, we nonetheless define the period from spring 2021 to spring 2023 as the post-pandemic period. During this period, pandemic-era restrictions were lifted and school operations returned to normal.

some dimensions coincide with the onset of the pandemic, which is not surprising. However, along many dimensions the largest declines occurred after the pandemic, between the 2020-21 and 2022-23 school years.

We test for heterogeneity in the trends by (a) the socioeconomic status (SES) of the school's students and (b) mode of instruction during the 2020-21 school year, when the COVID disruption was largest. High-SES schools have better working conditions in levels, but the declines in working conditions during and after the pandemic were similar in high- and low-SES schools (using multiple measures of SES). Schools in districts where more instruction was online during 2020-21 had significantly larger declines in working conditions compared to schools in districts where more instruction was in-person.

Our study is descriptive and not designed to identify the causal mechanisms underlying the decline in teacher working conditions. However, despite our inability to attribute the changes in working conditions causally to specific sources, we paint a concerning portrait of the post-pandemic work environment in public schools. Absent intervention, our findings give no indication that working conditions will rebound naturally now that the pandemic is behind us.

2. Background

2.1 What are teacher working conditions?

“Teacher working conditions” have been used to describe many aspects of the teaching profession. Merrill (2021) divides working conditions into two “meta-categories,” Actors and Constructs. Actors are people with whom teachers interact: principals, other teachers, parents, students, and community members. Constructs include all other things—i.e., not people—that affect the workplace. High-level subcategories of Constructs include school climate, professional development and other resources, quality of facilities, and safety. These subcategories cover a variety of more granular factors—for instance, “school climate” includes innovation, learning

climate, and professional trust and respect; and “professional development and other resources” includes new-teacher induction, formal professional development sessions, and class size.

Merrill (2021) synthesizes a narrative definition of teacher working conditions from the literature as “nonpecuniary elements of the workplace that affect teaching” (p. 172). Examples of individual studies that use a similar definition are Feng (2014), Johnson (2006), and Ladd (2011).

2.2 Teacher well-being, job satisfaction, and working conditions during and after the COVID pandemic

Working conditions are not synonymous with teacher well-being, though the two are related. Studies of working conditions during the pandemic are rare, but there are many studies of teacher well-being. For example, in a survey of Australian teachers in the summer of 2020, during the pandemic peak, Billet, Turner, and Li (2023) found that many teachers had high levels of stress, low levels of positive feelings (e.g., joy, contentment with work), and low levels of self-efficacy. Similarly, Chan et al. (2021) found high levels of stress and emotional exhaustion in a survey of U.S. teachers, also in the summer of 2020. Teachers reported the desire for more support for distance-based learning, greater emotional support, and additional job flexibility during the pandemic. In a survey of U.S. teachers conducted in March of 2021, Zamarro et al. (2022) find that over half indicated burnout from job related stress was a major concern, versus just 9 percent who said it was not a concern at all. Furthermore, they show teachers who switched instructional modes during the 2020-21 school year, and who were more concerned about the health effects of COVID-19, had higher levels of burnout.

While there are many studies of teacher well-being during the pandemic, the literature to date has two limitations with respect to understanding changes in *working conditions*. First, and

most fundamentally, we are not aware of any large-scale studies focused explicitly on teacher working conditions. The pandemic caused many issues and disruptions for teachers inside and outside of schools, and it is not clear how broad insights about teacher well-being translate to working conditions specifically. Second, most studies are based on point-in-time survey data and do not track trends over time. To illustrate why this is a problem, note that concerns about teacher well-being have been raised by researchers for decades. For example, more than 20 years before the pandemic, Anderson et al. (1999) wrote “teachers are experiencing an ever burgeoning degree of frustration and burnout” (p. 3) and around the same time, van Dick and Wanger (2001) reported “teachers are exposed to workloads which result particularly in stress and strain” and “at least one third of the teachers can be seen as suffering under extreme stress and/or burnout” (p. 243). Just before the pandemic, Garcia-Carmona, Martin, and Aguayo (2019) released a meta-analysis of research on “burnout syndrome” among secondary-school teachers.² So, while research provides compelling evidence that teachers were facing many pressures during the pandemic, the extent to which teacher well-being *changed* with the pandemic—even abstracting from the issue that well-being and working conditions are not synonymous—is unclear.

A handful of very recent studies provide evidence that overcomes some of these limitations, but they paint a mixed and incomplete picture of what happened during the pandemic. As part of a long-run analysis of trends in teacher job satisfaction, among other aspects of the profession (though not working conditions specifically), Kraft and Lyon (2024) show evidence of declines in job satisfaction coinciding with the pandemic. However, they examine multiple survey instruments, and the declines are not consistent across all surveys.

² These are just several of many possible examples.

Moreover, many of the surveys they use are too intermittent to detect a trend change narrowly around the pandemic.

Similarly, Redding and Nguyen (2024) track multiple indicators of working conditions and job satisfaction over time using the Schools and Staffing Survey (SASS) and find mixed evidence with respect to changes around the pandemic. From 2016 to 2021 (the two most recent waves of the SASS) some of their indicators improve, and some worsen. Most directly related to our study, Redding and Nguyen (2024) examine three working-condition indicators: (1) administrative support, (2) teacher cooperation, and (3) adequate materials, all of which showed *improvement* between 2016 and 2021. However, the period from 2016 to 2021 covers the onset of the pandemic and several pre-pandemic years, clouding inference about the pandemic specifically.

Turning to the post-pandemic period, we are not aware of any research that quantifies trends in teacher working conditions. There is some research on teacher well-being and job satisfaction, but the results are mixed. A survey conducted by EdChoice (2024) reports declining post-2021 trends in teacher well-being as measured by the fraction of teachers who believe “things in K-12 education are generally going in the right direction” and who “would recommend teaching to a friend or family member.” In contrast, Doan, Steiner, and Pandey (2024) find teachers’ levels of job-related stress and depression symptoms have declined since the height of the pandemic, suggesting an improvement in their well-being.

We contribute to the literature by tracking trends over time for 20 detailed indicators of teacher working conditions annually from 2016-17 to 2022-23. Our sample timeframe spans periods before, during, and after the pandemic, and our survey covers a much larger sample of

teachers than most prior studies (100,000+ annually beginning in 2019). We describe our data and methods in the next section.

3. Data & Methods

3.1 Overview of the analytic sample

Our data are from the 5E Survey, which is administered annually to students and teachers in Illinois. The 5E Survey was incorporated into Illinois' Every Student Succeeds Act (ESSA) plan beginning with the 2018-19 school year under Public Act 100-1046 (hereafter, we refer to school years by the spring year—e.g., 2018-19 as 2019). Subsequently it has become an annual fixture in most public schools statewide, save for the year 2020, when the onset of the COVID pandemic disrupted school operations during the survey window in the spring. The 5E Survey was also administered in Illinois prior to 2019, but not as comprehensively.

We merge the 5E Survey data with federal data on schools and districts. At the school level we merge in enrollment, and student demographic and socioeconomic variables, from the Common Core of Data (CCD) each year. We also merge in data on school neighborhood poverty, which is a geospatial estimate of local-area poverty provided by the National Center for Education Statistics (NCES). Our version of school neighborhood poverty is manipulated mathematically following Fazlul, Koedel, and Parsons (2023) to provide an estimate of the fraction of students from families with incomes at or below 130 percent of the poverty line. We follow their terminology and refer to this measure as IPR(130).³

At the district level, we merge in each district's local-area median household income from NCES's Education Demographic and Geographic Estimates (EDGE) program. The EDGE data are sourced from the American Community Survey, averaged over the years 2017-2021

³ Fazlul, Koedel, and Parsons (2023) show that free and reduced-price lunch enrollment, which is commonly used to measure poverty status, overstates poverty significantly.

(this is the data range available in EDGE that is closest in coverage to the years of our 5E Survey dataset). Finally, we merge in district-level information on schools' modes of instruction during the 2020-2021 school year. The mode-of-instruction data are from the COVID-19 School Data Hub.⁴

The broad coverage of the 5E Survey dataset is a key strength of our study and documented in Table 1. The first vertical panel shows school coverage of the 5E Survey relative to all schools listed in the CCD in Illinois, unweighted and weighted by student enrollment. Focusing first on the data from 2019 onward, between 77 and 80 percent of schools listed in the CCD are in the 5E Survey dataset each year, and these schools account for 90 to 93 percent of total student enrollment in Illinois. Missing schools are mostly small, and a mix of schools that are truly missing and schools for which data are suppressed in the 5E Survey dataset because of small teacher sample sizes (i.e., $N < 8$ teachers).

The second vertical panel of the table documents teacher participation conditional on school coverage. The teacher response rate ranges from 75-82 percent annually from 2019-2023. These response rates are on par with Kraft, Simon, and Lyon (2021), and higher than most similar surveys. For instance, Redding and Nguyen (2024) report the teacher response rate on the Schools and Staffing Survey—a high-quality and widely-used survey dataset—was 62 percent in 2021. Response rates to other surveys that ask similar types of questions about working conditions are often in the 50s, or lower, when reported (e.g., EdChoice, 2024; Horng, 2009).⁵ Combining the school coverage of the 5E Survey with the teacher response rate, Table 1 shows

⁴ We report district averages of monthly school enrollment data by learning mode collected by the Illinois State Board of Education and aggregated to annual averages by the COVID-19 School Data Hub (Accessed on 04.23.2024 at: <https://www.covidschooldatahub.com>).

⁵ A surprising number of studies that rely on surveys in this literature do not report survey response rates.

that on average from 2019 to 2023, our dataset includes survey responses from approximately 127,000 individual teachers working in 3,500 schools annually.⁶

The bottom two rows of Table 1 report on the survey data from 2017 and 2018, which predate the incorporation of the 5E Survey into Illinois' ESSA plan. The pre-2019 survey coverage rates are much lower, at about 55 percent of enrollment-weighted schools in each year. Interestingly, the teacher response rates are higher conditional on working in a covered school—in the range of 85-87 percent—but because many fewer schools participated, total teacher coverage is lower.⁷ In Appendix A we show that while the pre-2019 school sample is broadly similar to the full sample of Illinois schools, there are modest differences.

We wish to incorporate the pre-COVID data into our analysis to establish trends in teacher working conditions leading into the pandemic, but Table 1 suggests the potential for bias due to a compositional shift in the sample. We address this issue in two ways. First, our preferred approach is to re-weight the 2017 and 2018 datasets so the samples in those years better match the 2019 sample in terms of representing teachers in low-income and high-minority schools. The re-weighting increases comparability between the pre- and post-2019 survey data, reducing concerns about bias due to a shift in the composition of schools. Details on the reweighting procedure are provided in Appendix A.

Our second approach is to conduct our analysis over the years 2017 to 2023 using just the sample of schools in the 5E Survey dataset in 2017. This approach is appealing because it mechanically prevents bias due to changes in the composition of the school sample over time.

⁶ The 5E Survey uses a broad definition of “teacher” that includes case managers, counselors, social workers, instructional coaches, librarians, reading specialists, speech-language pathologists, teacher aides, paraprofessionals, and special education classroom assistants. For ease of presentation, we refer to this broad group who receive the teacher portion of the 5E Survey as “teachers.”

⁷ Prior to 2019, schools were required to administer a learning-conditions survey every other year under different legislation (Public Act 097-0008).

However, it is costly because we must exclude a substantial fraction of Illinois schools (i.e., all schools without survey data in 2017). Ultimately, both approaches yield similar results. We use our preferred re-weighting approach in the main text; corroborating results using the fixed sample of 2017 schools are available in the appendix as described below.

3.2 *Measuring teacher working conditions*

3.2.1 *Measurement and scaling*

The 5E Survey is administered in the winter/spring of each school year and elicits feedback from students and teachers about conditions in their schools. The results are reported for schools at three levels of increasing aggregation: Measures, Essentials, and an Essentials Summary Score. The lowest level of aggregated responses is a Measure. Examples of Measures that capture aspects of teacher working conditions include “Teacher Safety” and “Instructional Leadership.” Essentials aggregate over Measures to form five large categories of school conditions: Effective Leaders, Collaborative Teachers, Involved Families, Supportive Environment, and Ambitious Instruction (Sebring et al., 2006). Finally, the Essentials Summary Score is a singular, summative indicator that incorporates all survey items and respondents.

Given our interest in teacher working conditions, we focus on the 20 Measures on the 5E Survey that summarize teacher-directed survey items. Each Measure is a school-level indicator that combines information over (a) multiple survey items within the same domain and (b) the teachers within a school. The information is combined using Rasch analysis, which is a method for aggregating over survey items and respondents that accounts for imprecision due to a variety of factors (Hart et al., 2020). The Rasch analysis is conducted by the developers and administrators of the 5E Survey—the University of Chicago Consortium on School Research—

prior to providing the results to the Illinois State Board of Education (ISBE). Data disaggregated below the school-level Measures are not available.⁸

We elaborate briefly on the Rasch analysis in order to provide a deeper understanding of our data. Rasch analysis employs principles of item response theory (IRT) to estimate (a) “attitudes” for each respondent, and (b) “difficulty” for each survey item. An “attitude” is estimated for a respondent based on his or her answers to survey items in a particular domain (i.e., in a Measure). “Difficulty” is an item-level construct estimated based on the number of survey respondents who endorse the item—e.g., an item that is endorsed less often is more difficult (this is analogous to the application of IRT to a cognitive test, where difficulty depends on the number of test takers who answer the item correctly).

These estimates of individual attitudes and item difficulties are used to sharpen inference from the survey data when aggregated. For instance, the “attitude” estimates permit the identification of teachers who answer questions in a statistically improbable way, such as by giving answers at random or being self-contradictory. Responses from these teachers are given less weight in the school-level Measures. The “difficulty” estimates are also used to re-weight teachers’ answers, this time over survey items to give more weight to items that contain more differentiating information, such as items that exhibit greater variance among respondents.

The estimates of teachers’ attitudes and items’ difficulties can be thought of as additional information gleaned from the survey data, which is used to produce school-level Measures that are more informative than simple aggregations of teachers’ answers to the survey questions. The process is analogous to how IRT is used to produce scaled scores on standardized tests that are

⁸ Teacher-level data are not made available to researchers by the Consortium on School Research, nor are they provided to the ISBE. In fact, to our knowledge, they are not used in any capacity. We believe this is because the survey is not designed to study individual teachers, but rather to measure conditions of schools.

more informative about student knowledge than simple aggregations of correct and incorrect answers. For a more detailed and technical discussion of Rasch analysis, see Bond and Fox (2012).

Once constructed, each Measure in each year is standardized and scaled from 1-99. The standardization is always with respect to the 2013 school distribution in Illinois. A value of 50 is meant to indicate the 2013 average. A 20-point move is equivalent to one standard deviation in the 2013 distribution. The benchmarking to the 2013 distribution in all years facilitates straightforward comparisons of changes over time in terms of both sign and magnitude. For instance, an increase of 10 points from 2019 to 2021 for a particular Measure will mean the same thing (distributionally) as an increase of 10 points from 2021 to 2023.⁹

3.2.2 *Content of the survey & working conditions at baseline (2019)*

Table 2 lists the 20 teacher-directed Measures on the 5E Survey, which are comprised of 105 total survey items. Appendix Table B1 shows the individual survey items under each Measure.

The Measures span most of Merrill's (2021) working-conditions catalog. For instance, they cover interactions with Merrill's *Actors* including principals (e.g., instructional leadership, teacher-principal trust), other teachers (e.g., collaborative practices, teacher-teacher trust), students (e.g., level of classroom disruptions, student responsibility, quality of student discussions), and parents (e.g., parent influence on decision making in schools, parent

⁹ Noting this advantage of the 2013 benchmarking for facilitating our analysis of changes over time, an interpretive challenge is that while the 5E Survey was administered in 2013, the administration was not universal (like in all pre-2019 years). This creates some ambiguity with respect to what it means to move in the observed 2013 distribution. Put differently, we cannot be sure that a 10-point change translates to a 0.50 standard deviation move in the full 2013 distribution of schools because the full distribution is unobserved. In Appendix A (Appendix Table A2) we explore this issue using earlier survey data. We conclude the suggested translation of test points to standard-deviation units is likely accurate, at least to a close approximation, and we use it when we interpret our findings below.

involvement, teacher-parent trust). Among Merrill's *Constructs*, the Measures cover aspects of school climate (e.g., innovation, teacher influence, program coherence, expectations for postsecondary education, reflective dialogue), professional development (e.g., quality professional development, socialization of new teachers), and safety (e.g., teacher safety). Some Measures fit into more than one category in Merrill's framework.

Though the Measures do not cover every category in Merrill (2021), they touch on most of them, and arguably the most important ones. For instance, when teachers are surveyed about the aspects of their jobs they value most, they often emphasize aspects related to the work culture, such as effective leadership and a collaborative work environment, or aspects related to professional development resources, such as strong teacher support systems (Grissom, Viano, and Selin, 2015; Johnson, Kraft, and Papay, 2012; Simon and Johnson, 2015). These and related concepts are well-represented on the 5E Survey.¹⁰

Table 2 reports teacher-weighted means and standard deviations of the Measures using data from 2019, which is the last survey year prior to the onset of the COVID pandemic. Higher values always indicate more favorable conditions (e.g., the "level of classroom disruptions" Measure is reverse-coded). Column (1) shows most Measures have a mean around 50, though several are notably higher (e.g., level of classroom disruptions, socialization of new teachers) and several notably lower (e.g., teacher influence, innovation). The standard deviations are also generally close to 20. Columns (2) and (3) divide schools into above- and below-median groups based on IPR(130), which is our measure of the fraction of students living at or below 130 percent of the poverty line. Comparing across these columns shows the familiar pattern from

¹⁰ Examples of categories in Merrill's framework not directly represented on the 5E Survey are working conditions related to interactions with community members (under *Actors*), school features (e.g., class size; under *Constructs*), and facilities (e.g., cleanliness, materials; under *Constructs*).

prior research that teacher working conditions are better at high-SES schools (Johnson, Kraft, and Papay, 2012; Kraft, Simon, and Lyon, 2021; Loeb, Darling-Hammond, and Luczak, 2005). This is true on average as indicated by the bottom row of the table, as well as for 17 of the 20 Measures individually.

3.3 *Illinois context*

The depth of the 5E Survey and its coverage within Illinois are strengths of our study, but a limitation is that our sample is restricted to Illinois schools. In Appendix Table C1, we provide basic context for our study by comparing the Illinois student population to the nation using data from the CCD. The table shows Illinois students are broadly similar to students elsewhere in the U.S. along demographic and socioeconomic dimensions.

Chicago Public Schools (CPS) is the largest school district in Illinois. In 2019, CPS accounted for about nine percent of total public-school enrollment statewide. Though the population of many U.S. states is disproportionately concentrated in 1-2 major cities, Chicago's presence in our dataset is noteworthy due to CPS's pandemic response. Initially, CPS's response was typical of urban school districts elsewhere in the U.S. For example, CPS went fully remote during the 2020-21 school year, and there is no indication that this decision was any more or less controversial than in other major cities. CPS also fully re-opened to start the 2021-22 school year. However, while many urban districts grappled with the pandemic into the 2021-22 school year, CPS's struggles were arguably more pronounced and contentious. For instance, in January 2022, CPS teachers walked out due to concerns over COVID safety. The walkout lasted about a week and resulted in the cancellation of classes, and then-mayor Lori Lightfoot called it an illegal work stoppage (Clark, 2022).

Zooming out from Chicago and looking at the state as a whole, multiple data points suggest the pandemic was more disruptive to Illinois schools than in the average state, but not dramatically so. For instance, during the 2020-21 school year Illinois students spent, on average, 24 percent of their school time in-person, 41 percent of their time in hybrid learning, and the remaining 35 percent of their time online (see Appendix Table C1). These numbers put Illinois in the top quartile of states in terms of time spent in remote learning (Goldhaber et al., 2023). Masking was also required of all teachers, staff, students, and visitors to Illinois schools through the 2021-22 school year. Similar masking orders were in place in most Northeastern and Western states, whereas most states in the Midwest and South did not have state mandates for the 2021-22 school year. The increase in chronic student absenteeism in Illinois—which spiked in 2020 with the pandemic and has remained elevated since—was substantial, but similar to the increase in many other states. Enrollment declined by 3.4 percent between 2020 to 2022 in Illinois public schools, which is the 18th largest decline among the 50 states during this period. Taken together, these data points suggest the COVID pandemic had a larger-than-average impact on Illinois schools, but outside of Chicago, there is no indication the Illinois experience was uniquely disruptive. To explore the potential for Chicago to disproportionately drive our findings, below we show working-condition trends separately in CPS and other Illinois school districts.¹¹

3.4 Methods

We document trends in teacher working conditions using teacher-weighted averages of the school-level survey Measures. With the teacher weights, our results can be interpreted as showing the changes in working conditions experienced by the average Illinois teacher (who filled out the survey). In the appendix, we show our findings are unchanged substantively if we

¹¹ The comparative information provided in this paragraph is taken from the American Enterprise Institute’s Return2Learn tracker (retrieved 12.18.2024 at: <https://www.returntolearntracker.net/>).

do not use the teacher weights, the consequence of which is that teachers in small schools are effectively given more weight in the data.

Our preferred approach to documenting the working-condition trends is fully non-parametric—i.e., entirely descriptive and without the use of a model. Our descriptive approach is mathematically equivalent to estimating the trends using simple, teacher-weighted linear regressions of the Measures on indicator variables for each year, as follows:

$$Y_{it}^k = \alpha_0^k + D_t \gamma^k + \eta_{it}^k \quad (1)$$

In Equation (1), Y_{it}^k is the value of Measure k in school i and year t , and D_t is a vector of year indicator variables. The coefficients of interest, γ^k , capture the trends over time for each Measure. We also confirm in the appendix that our findings are robust to controlling for school fixed effects by estimating the following expanded version of Equation (1):

$$Y_{it}^k = \zeta_0^k + D_t \delta^k + \lambda_i^k + \nu_{it}^k \quad (2)$$

The school fixed effects in Equation (2) are denoted by λ_i^k . All of our statistical tests account for district-level clustering in the data.

Our primary results capture trends over time for the full workforce, but the composition of the workforce is changing due to teacher entry and exit. This means that our findings combine changes in perceptions over time within teachers (i.e., among stable workforce participants) and changes caused by any differential perceptions between exiters and entrants. We cannot formally separate these channels because we do not have teacher-level data, but the scope for the latter to influence our findings is limited by the fact that the vast majority of the teaching workforce is stably employed from year-to-year.¹² Moreover, teacher entry- and exit-rate trends are relatively

¹² It is common in the literature to report that teacher turnover is “high,” but of course, this is a relative statement and the vast majority of teachers do not exit in any given year.

flat during the period covered by our data panel. For instance, using ISBE data, we calculate that the new-teacher share of the workforce in Illinois fluctuated narrowly between 0.054 and 0.067 from 2017 to 2023. This suggests compositional changes to the workforce over time are unlikely to meaningfully influence the working-condition trends.

We also examine trend heterogeneity along several dimensions, focusing on the pandemic and post-pandemic periods from 2019 to 2023. In addition to reporting results separately for Chicago Public Schools and other districts, we explore the potential for socioeconomic heterogeneity by dividing schools at the median based on IPR(130) and the share of Black enrollment. At the district level, we divide schools based on whether their districts have above- or below-median local-area household incomes. We also document separate trends for schools in districts that differ by the predominant mode of instruction during the 2021 school year: in-person, hybrid, or online.

Finally, we estimate a simple hierarchical linear model (HLM) with random district intercepts to summarize and disentangle the relationships between teacher working conditions and the various school and district attributes. The HLM is teacher-weighted and specified as follows:

$$\Delta Y_{ij} = \beta_0 + X_{1i}\beta_1 + X_{2i}\beta_2 + X_{3j}\beta_3 + X_{4j}\beta_4 + \mu_j + \varepsilon_{ij} \quad (3)$$

In Equation (3), ΔY_{ij} is the average change over the 20 Measures of teacher working conditions from 2019-2023 at school i in district j (i.e., the 2023 value minus the 2019 value), X_{1i} is IPR(130), X_{2i} is the school share of Black students, X_{3j} is median household income in the district catchment area, and X_{4j} is a two-entry vector with the instructional shares for virtual and hybrid learning during the 2020-21 school year (the in-person instruction share is the omitted

category). μ_j is a district random effect and ε_{ij} is an idiosyncratic error, which is implicitly clustered by district in the HLM.¹³

4. Results

4.1 Trends in the full sample

We begin in Table 3 by showing changes in teacher working conditions in the full sample over different timespans covered by our data panel. First, column (1) shows that from 2017-2023 working conditions generally declined. The bottom row of the table shows the average change over all Measures was -2.9 points, which is equivalent to a decline of about 15 percent of a benchmarked standard deviation. The subsequent columns indicate the decline over the full period is driven by declines during and after the pandemic. This is easiest to see in column (3), which shows that in the two years leading into the pandemic from 2017-2019, teacher working conditions did not worsen and in fact improved (by 4.0 points on average).

Column (4) shows working conditions declined during the pandemic, but only modestly, by 1.4 points on average over the 20 Measures. Moreover, for many individual Measures (11 of 20) there was no decline at all. Combining the trends from 2017-2019 and 2019-2021, our results are consistent with Redding and Nguyen (2024), who find small improvements in working conditions between 2016 and 2021 using the limited set of indicators available in the Schools and Staffing Survey.

However, in contrast with previous studies, the breadth of information on the 5E Survey and regularity of its administration allow us to paint a more comprehensive picture of how working conditions changed with the onset of the pandemic. For instance, several Measures on the 5E Survey indicate large declines during the pandemic, such as Measures of collaborative

¹³ In an analysis suppressed for brevity we also estimate Equation (3) as a simple linear regression and obtain similar results.

practices, student responsibility, and reflective dialogue. Declines in these areas are not surprising given the nature of the COVID disruption to schools. Most of the positive changes to working conditions during the pandemic were substantively small—only three Measures changed positively by more than 2.0 points between 2019 and 2021—with the key exception of teacher safety, which is the Measure with the largest increase during the pandemic period. Teachers’ improved sense of safety from 2019 to 2021 likely reflects the fact that many teachers were spending more time at home during the 2020-21 school year.

The last column of Table 3 shows there was a larger decline in working conditions in the post-pandemic period from 2021 to 2023, during which the average decline over the 20 Measures was 4.5 points. This is over 20 percent of a benchmarked standard deviation, or 8.5 percent of the 2019 mean (per Table 2). The largest declines were along the dimensions of collective responsibility, innovation, and teacher safety. The post-pandemic decline in safety more than offset the gain in safety during the pandemic.

Teachers report intuitive improvements in working conditions along some dimensions during the post-pandemic period—e.g., the Measures of collaborative practices and reflective dialogue both partially rebounded from their 2021 lows by 2023. But some post-pandemic changes are unintuitive, such as continued declines from 2021 in the quality of student discussions and quality of professional development. Teachers also report trust between themselves and principals, parents, and other teachers declined in the post-pandemic period. These results do not support the idea that the COVID pandemic was a low point for teacher working conditions.

The Measure of classroom disruptions is also interesting. There are empty cells for this Measure in Table 3 because no value is available in 2021. However, from the three data points

we can observe (in 2017, 2019, and 2023), we draw two conclusions. First, the level of classroom disruptions experienced by teachers was trending in a favorable direction prior to the pandemic. Second, during the pandemic and post-pandemic periods, classroom disruptions became substantially worse, with this Measure declining by more than a full benchmarked standard deviation from 2019 to 2023, or over a third of the 2019 mean value (-25.3 points). We cannot identify separate trends during the pandemic and post-pandemic periods, but over the full period spanning 2019 to 2023, this is the Measure with the largest decline by a wide margin.

Figure 1 visualizes the trends in Table 3. For each Measure we recenter the 2019 value on zero, then report the trend from 2017-2023. The trend averaged over all Measures is shown in bold, overlaid on the trends for the individual Measures in grey. In years when the value of a Measure is missing because it was not included on the survey, we interpolate linearly over observed years. Although there are too many Measures to distinguish each one (for this, use Table 3), the figure is nonetheless useful for visualizing the broad trends in working conditions over time.

The results in Table 3 and Figure 1 are similar if we do not use the teacher weights, which we show in Appendix Table C2. Appendix Tables C3 and C4 show our findings are also similar if we use a model-based approach to estimate the trends.¹⁴ In Appendix Table C5, we show the results are similar if we restrict our analysis to the subsample of schools in the 5E Survey dataset in 2017, which rules out bias from the compositional change to our sample as an explanation for the differences in the pre- and post-COVID trends.

¹⁴ These tables show coefficients on the year indicator variables from Equations (1) and (2), estimated relative to 2019. Given that the estimates are relative to 2019, a quick way to see the similarity of results with Table 3—or mathematical equivalence in the case of Appendix Table C3—is to compare the coefficients from the “2021” and “2023” columns in the appendix tables to the changes over 2019-2021 and 2019-2023 in Table 3.

Finally, while our focus is on the teacher-directed Measures on the 5E Survey, in Appendix Table C6 we document analogous trends in the student-directed Measures. The student surveys indicate smaller declines in school conditions overall, and more Measure-by-Measure variability. An interesting parallel to the teacher responses is that like teachers, students identify the largest declines in school conditions as having occurred from 2021 to 2023. In fact, students did not indicate declines in school conditions on average from 2017 to 2021 at all—the declines they report are entirely concentrated in the post-pandemic period from 2021 to 2023.

4.2 *Trend heterogeneity*

In Table 4 we document trends in working conditions in high- and low-SES schools, focusing on the period from 2019 to 2023. In columns (1)-(4) we divide schools at the median based on IPR(130) and the share of Black students in 2019. In columns (5)-(6) we divide schools at the median based on household income in their districts using the EDGE data.

Despite high-SES schools having more favorable working conditions in levels (per Table 2), Table 4 shows the trends since 2019 are similar in both high- and low-SES schools. This is easiest to see by looking at the average changes in the bottom row of the table. The trends on a Measure-by-Measure basis are also mostly similar, though there are some individual differences. In results suppressed for brevity we explored this result in more detail by dividing schools into terciles rather than at the median, then comparing the top and bottom terciles in each category to create larger SES gaps. We obtain similar results, and thus conclude there have not been large differences in the trends at high- and low-SES schools.

In Table 5 we compare trends in districts that differ by the primary mode of instruction during the 2020-21 school year and observe a more consistent pattern. Specifically, schools in primarily online districts showed the largest declines in working conditions, followed by schools

in primarily hybrid districts, followed by schools that were primarily in-person. The gap between the primarily online and in-person groups is quite large—on average across Measures, the former group’s working conditions declined by an additional 3.5 points (-8.3 versus -4.8), or more than 15 percent of a standard deviation, from 2019 to 2023.

Table 6 presents results from Equation (3), complementing the comparisons in Tables 4 and 5. In Columns (1) to (4) we examine the relationship between teacher working conditions and each SES and instructional-mode variable (or set of variables) separately. In column (5) we estimate the full model shown in Equation (3). The SES results from the full model are mixed, like in Table 4. That is, having more students in poverty is conditionally associated with a larger reduction in teacher working conditions, but so is a higher median household income (though only the latter relationship is statistically significant). In terms of mode of instruction, Table 6 show the differences in Table 5 hold up conditional on the SES controls—i.e., schools in districts with more online instruction had significantly larger declines in teacher working conditions from 2019-2023.

In Appendix Table C7, we show the working-condition trends separately for CPS and non-CPS schools. In both groups, working conditions declined from 2019 and 2023 overall, and the decline was larger from 2021 to 2023 than from 2019 to 2021. However, the declines in Chicago were more pronounced. For instance, the average decline across the 20 Measures in CPS schools between 2019 and 2023 was 11.3 points, versus 6.0 points in schools outside of CPS. In an analysis suppressed for brevity, this finding prompted us to explore whether our other heterogeneity analyses are unduly influenced by CPS schools, but we find no evidence of this.¹⁵

¹⁵ Most notably given that CPS was fully online during the 2020-21 school year, this includes the heterogeneity analysis by mode of instruction. In fact, in the HLM model, the coefficient on online instruction does not change statistically when we omit CPS schools. This indicates the conditional relationship between teacher working conditions and online instruction is similar inside and outside of CPS.

5. Summary and Conclusion

To the best of our knowledge, we provide the first in-depth empirical analysis of changes to teacher working conditions during and after the COVID pandemic. We use rich survey data from Illinois to show working conditions were improving leading into the pandemic (from 2017 to 2019), declined with the onset of the pandemic (from 2019 to 2021), and then declined at a faster rate after the pandemic (from 2021 to 2023). Our findings complement recent work by Kraft and Lyon (2024), who show that professional prestige and job satisfaction among teachers have been declining nationally for over a decade. Our work suggests declining teacher working conditions since the pandemic may exacerbate problems in the profession going forward.

During the pandemic and post-pandemic periods from 2019 to 2023, some of the largest declines in working conditions were in the areas of classroom disruptions, student responsibility, quality of student discussions, expectations for postsecondary education, and innovation. The patterns of change over the pandemic and post-pandemic periods are heterogeneous in both intuitive and unintuitive ways. For example, it is intuitive that working conditions related to collaboration and reflective dialogue declined during the pandemic, then partially rebounded in the post-pandemic period. However, it is unintuitive that teachers report the quality of student discussions continued to deteriorate from 2021 to 2023, as did the quality of professional development. Given the challenges schools were facing in 2021, one might have expected this to be a low point for these types of working-condition indicators, but this is not what teachers perceived. Additional concerning findings in our post-pandemic analysis are declines in teacher-parent, teacher-principal, and teacher-teacher trust, and a substantial reduction in teachers' perceptions of safety. The latter result is partly a reversal of teachers' improved sense of safety when they were working at home more often during the pandemic; however, this explanation cannot account for the full post-pandemic decline in teacher safety from 2021 to 2023.

The persistent decline in teacher working conditions we document through 2023 is consistent with emerging research on other persistent changes in schools since the pandemic. For example, Jacob (2024) and Jacob and Stanojevich (2024) document how school and classroom operations have changed. Among the more notable changes is a greater emphasis on students' mental health, which has led to, among other things, teachers giving students less homework, allowing late work, and allowing students to retake exams. These changes are reflected in higher post-pandemic grades that do not correspond to other indicators of academic performance, like standardized test scores (Goldhaber and Young, 2024; Lemov, 2024; Sanchez, 2023). Classrooms have also become more reliant on technology. Teachers are increasingly using technology to deliver instruction, provide remediation, and facilitate independent student work during class. Correspondingly, teachers are spending less time giving traditional lectures.

Thus, we contribute to an emerging body of evidence showing that the pandemic was not merely a transitory disruption to public education. Rather, many of the changes brought on by the pandemic have endured. Combined with evidence from previous research linking working conditions to job satisfaction and turnover (Geiger and Pivovarova, 2018; Kraft, Marinell, and Shen-Wei Yee, 2016; Redding and Nguyen, 2024; Simon and Johnson, 2015), our findings motivate a renewed focus on teacher working conditions by researchers, policymakers, and school officials.

We conclude by noting the strengths and limitations of our study. The primary strengths are the depth of information on teacher working conditions in the 5E Survey, its wide coverage of schools, and the high teacher response rate. The depth of the survey gives us confidence that the trends we have identified reflect teachers' true perceptions of their working conditions—i.e., we are not depending on a small number of survey items to draw broad conclusions. The high

coverage of the survey, and high teacher response rate, limit concerns about biased inference due to sample selection.

We also note two limitations. First, we use data from a single state. Though we see no reason to believe the changes in Illinois schools since the onset of pandemic have been unique, the pandemic was more disruptive than average in Illinois, and research to inform the generalizability of our findings to other states would be valuable. Second, we do not identify the precise causal factors driving the declines in teacher working conditions. With the many changes schools experienced during and after the pandemic, the explanations are almost surely complex and multifaceted. Future work to understand which changes in schools have been most important for driving the declines in teacher working conditions would be of great value, and a critical next step toward developing mitigation strategies.

References

- Anderson, V.L., Levinson, E.M., Barker, W., and Kiewra, K.R. (1999). The effects of mediation on teacher perceived occupational stress, state and trait anxiety, and burnout. *School Psychology Quarterly* 14(1), 3-25.
- Billett, P., Turner, K., and Li, X. (2023). Australian teacher stress, well-being, self-efficacy, and safety during the COVID-19 pandemic. *Psychology in Schools* 60, 1394-1414.
- Bond, T. G., and Fox, C. M. (2012). *Applying the Rasch Model: Fundamental Measurement in the Human Sciences* (2nd ed.). New York: Routledge.
- Clark, N. (2022). Chicago public school classes are canceled after teachers' union backs remote learning. NPR Morning Edition Live Blog (01.05.2022).
- Chan, M., Sharkey, J.D., Lawrie, S.I., Arch, D.A.N., and Nylund-Gibson, K. (2021). Elementary school teacher well-being and supportive measures during COVID-19: An exploratory study. *School Psychology* 36(6), 533-45.
- Dee, T.S. (2024). Higher chronic absenteeism threatens academic recovery from the COVID-19 pandemic. *Proceedings of the National Academy of Sciences* 121(3), 1-3.
- Doan, S., Steiner, E.D., and Pandey, R. (2024). Teacher well-being and intentions to leave in 2024: Findings from the 2024 State of the American Teacher Survey. Policy report. RAND Corporation.
- EdChoice (2024). Teachers and K-12 education: A national polling report. Policy report. Indianapolis, IN: EdChoice.
- Fazlul, I., Koedel, C., and Parsons, E. (2023). Free and Reduced-Price Meal Eligibility Does Not Measure Student Poverty: Evidence and Policy Significance. *Economics of Education Review* 94, 1-16.
- Feng, L. (2014). Teacher placement, mobility, and occupational choices after teaching. *Education Economics* 22(1), 24-47.
- Garcia-Carmona, M., Martin, M.D., and Aguayo, R. (2019). Burnout syndrome in secondary school teachers: A systematic review and meta-analysis. *School Psychology of Education* 22, 189-208.
- Geiger, T., and Pivovarova, M. (2018). The effects of working conditions on teacher retention. *Teachers and Teaching* 24(6), 604-25.
- Goldhaber, D., Kane, T.J., McEachin, A., Morton, E., Patterson, T., and Staiger, D.O. (2023). The educational consequences of remote and hybrid instruction during the pandemic. *American Economic Review: Insights* 5(3), 377-92.

- Goldhaber, D., and Young, M.G. (2024). Course grades as a signal of student achievement: Evidence of grade inflation before and after COVID-19. *Journal of Policy Analysis and Management* 43(4), 1270-82.
- Goulas, S., and Pula, I. (2024). Why did schools lose students after COVID-19? Hamilton Project Policy Report. Washington, DC: Brookings Institution.
- Grissom, J.A., Viano, S.L., and Selin, J.L. (2015). Understanding employee turnover in the public sector: Insights from research on teacher mobility. *Public Administration Review* 76(2), 241-51.
- Hart, H., Young, C., Chen, A., Zou, A., and Allensworth, E.M. (2020). Supporting school improvement: Early findings from a reexamination of the 5Essentials Survey. Policy Report. Chicago, IL: University of Chicago Consortium on School Research.
- Hornig, E.L. (2009). Teacher tradeoffs: Disentangling teachers' preferences for working conditions and student demographics. *American Educational Research Journal* 46(3), 690-717.
- Jack, R., and Oster, E. (2023). COVID-19, School Closures, and Outcomes. *Journal of Economic Perspectives* 37(4), 51-70.
- Jacob, B.A. (2024). The lasting effects of the COVID-19 pandemic on K-12 schooling: Evidence from a nationally representative teacher survey. EdWorkingPaper No. 24-1020. Annenberg Institute at Brown University.
- Jacob, B.A., and Stanojevich, C. (2024). Did COVID-19 shift the "grammar of schooling"? EdWorkingPaper No. 24-1021. Annenberg Institute at Brown University.
- Johnson, S.M. (2006). The workplace matters: Teacher quality, retention, and effectiveness. National Education Association working paper (July 2006).
- Johnson, S.M., Kraft, M.A., and Papay, J.P. (2012). How context matters in high-need schools: The effects of teachers' working conditions on their professional satisfaction and their students' achievement. *Teachers College Record* 114(10), 1-39.
- Kraft, M. A., Marinell, W. H., & Shen-Wei Yee, D. (2016). School organizational contexts, teacher turnover, and student achievement: Evidence from panel data. *American Educational Research Journal*, 53(5), 1411-1449.
- Kraft, M.A., Simon, N.S., and Lyon, M.A. (2021). Sustaining a sense of success: The protective role of teacher working conditions during the COVID-19 pandemic. *Journal of Research on Educational Effectiveness* 14(4), 727-69.
- Kraft, M.A., and Lyon, M.A. (2024). The rise and fall of the teaching profession: Prestige, interest, preparation, and satisfaction over the last half century. Working Paper No. 23286. Cambridge, MA: National Bureau of Economic Research.

- Ladd, H.F. (2011). Teachers' perceptions of their working conditions: How predictive of planned and actual teacher movement? *Educational Evaluation and Policy Analysis* 33(2), 235-61.
- Lemov, D. (2024). Your neighborhood school is a national security risk. *Education Next* 24(1), 34-41.
- Loeb, S., Darling-Hammond, L., & Luczak, J. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education* 80(3), 44-70.
- Merrill, B.C. (2021). Configuring a construct definition of teacher working conditions in the United States: A systematic narrative review of researcher concepts. *Review of Educational Research* 91(2), 163-203.
- Redding, C., and Nguyen, T. (2024). Teacher working conditions and dissatisfaction before and during the COVID-19 pandemic. *Educational Researcher* 53(4), 233-44.
- Sanchez, E.I. (2023). Evidence of Grade Inflation since 2010 in High School English, Mathematics, Social Studies, and Science Courses. Policy report. ACT Incorporated.
- Sebring, P.B., Allensworth, E., Bryk, A.S., Easton, J.Q., and Luppescu, S. (2006). The essential supports for school improvement. Research report. Chicago, IL: Consortium on Chicago School Research at the University of Chicago.
- Simon, N., & Johnson, S. M. (2015). Teacher turnover in high-poverty schools: What we know and can do. *Teachers College Record* 117(3), 1-36.
- van Dick, R., and Wagner, U. (2001). Stress and strain in teaching: A structural equation approach. *British Journal of Educational Psychology* 71, 243-59.
- Zamarro, G., Camp, A., Fuchsman, D., and McGee, J.B. (2022). Understanding how COVID-19 has changed teachers' chances of remaining in the classroom. EdWorkingPaper No. 22-542. Annenberg Institute at Brown University.

Tables and Figures

Table 1. 5E Survey sample size and coverage by year.

Year (spring)	Schools & Students				Teachers		
	5E Schools	5E Schools as a fraction of all schools listed in the CCD	Number of students in 5E schools	Students in 5E schools as a fraction of total Illinois enrollment in the CCD	Number of teachers in 5E schools	Teacher survey response rate (Conditional on School Sampling)	Estimated number of teacher respondents (number*rate)
2023	3,524	0.80	1,725,630	0.93	167,527	77.13	129,219
2022	3,393	0.77	1,690,481	0.90	164,118	75.29	123,568
2021	3,436	0.78	1,707,862	0.90	164,095	76.22	125,078
2019	3,511	0.80	1,807,721	0.91	159,232	81.68	130,068
2018	2,029	0.47	1,096,685	0.55	84,013	86.77	72,896
2017	2,175	0.52	1,105,975	0.55	80,140	85.25	68,323

Notes: CCD=Common Core of Data. Due to the disruption caused by the COVID pandemic, the 5E Survey was not administered in 2020. The teacher survey response rate is calculated as the weighted average of schools' response rates where the number of teachers in the school is the weight. The estimated number of teachers surveyed is calculated by multiplying the number of teachers by the teacher survey response rate. Enrollment in some schools in the CCD is missing. If missing, we impute school enrollment using a contiguous year value in the CCD. If there is no contiguous year value, enrollment is imputed as the number of eligible student respondents to the 5E Survey, with an adjustment for primary schools given that the survey is not administered prior to the 4th grade. Schools that participated in the 5E Survey, but for which the data are censored due to small samples, are not included in the analysis that follows, and as such they are treated as being excluded from the 5E dataset in this table.

Table 2. Means and standard deviations of the focal survey Measures of teacher working conditions, 2019.

	All Schools	High-SES Schools: Below-median IPR(130)	Low-SES Schools: Above-median IPR(130)
	Mean (St Dev)	Mean (St Dev)	Mean (St Dev)
Level of Classroom Disruptions	75 (20)	80* (17)	68* (22)
Collaborative Practices	49 (24)	50 (23)	48 (24)
Collective Responsibility	47 (20)	48* (19)	45* (21)
Teacher Influence	39 (13)	41* (12)	38* (13)
Innovation	41 (23)	42 (22)	40 (24)
Instructional Leadership	46 (21)	47 (21)	46 (21)
Program Coherence	54 (20)	54 (19)	54 (20)
Parent Influence on Decision Making in Schools	52 (21)	54* (20)	50* (21)
Parent Involvement in School	51 (21)	57* (19)	45* (21)
Student Responsibility	55 (21)	60* (19)	48* (22)
Quality Professional Development	55 (22)	55 (22)	56 (23)
Reflective Dialogue	50 (22)	50 (21)	50 (23)
School Commitment	48 (20)	51* (19)	45* (20)
Quality of Student Discussions	53 (24)	57* (22)	49* (25)
Socialization of New Teachers	83 (22)	85* (21)	80* (23)
Teacher-Parent Trust	56 (24)	63* (22)	48* (24)
Teacher-Principal Trust	49 (18)	50 (18)	48 (19)
Teacher-Teacher Trust	53 (19)	55* (18)	51* (20)
Teacher Safety	43 (20)	47* (18)	38* (20)
Expectations for Postsecondary Education	54 (20)	59* (19)	49* (20)
Simple Average	52.7	55.3	49.8

Notes: All values are teacher-weighted averages of the school-level survey Measures. High and low-SES schools are defined, respectively, as below- and above-median schools as measured by the share of students living at or below 130 percent of the poverty line.

* indicates the difference between high- and low-SES schools is statistically significant at the 5 percent level. The tests for statistical significance are regression-based and account for district-level clustering. We do not report on statistical significance for the averages in the bottom row of the table.

Table 3. Changes in teacher working conditions over various time periods.

	Full Panel	During & After the Pandemic	2-Year Windows (Spring to Spring)		
	2017-2023	2019-2023	2017-2019	2019-2021	2021-2023
Level of Classroom Disruptions	-11.4*	-25.3*	13.9*		
Collaborative Practices	0.5	-5.1*	5.6*	-10.7*	5.6*
Collective Responsibility	-6.8*	-9.5*	2.7*	1.0*	-10.5*
Teacher Influence	-0.4	-2.5*	2.1*	1.4*	-3.9*
Innovation	-10.0*	-10.4*	0.4	1.9*	-12.3*
Instructional Leadership	-0.3	-4.2*	3.9*	0	-4.2*
Program Coherence	2.2*	-3.6*	5.8*	2.9*	-6.6*
Parent Influence on Decision Making in Schools	3.2*	2.4*	0.8	5.6*	-3.2*
Parent Involvement in School	3.6*	-3.5*	7.1*	-2.5*	-1.1*
Student Responsibility	-10.3*	-10.3*	0	-12.0*	1.7*
Quality Professional Development	0.4	-6.1*	6.4*	-4.3*	-1.7*
Reflective Dialogue	-4.6*	-8.2*	3.6*	-17.8*	9.6*
School Commitment	-7.2*	-9.5*	2.2*	-0.2	-9.3*
Quality of Student Discussions	-10.2*	-12.6*	2.4*	-5.7*	-6.9*
Socialization of New Teachers	2.7*	1.4*	1.3	1.3*	0.1
Teacher-Parent Trust	-1.7	-6.9*	5.3*	0.6	-7.6*
Teacher-Principal Trust	-2.5*	-3.5*	1.0	0.8	-4.3*
Teacher-Teacher Trust	0.9	-4.5*	5.4*	0.4	-4.9*
Teacher Safety	-3.3*	-6.3*	3.0*	13.5*	-19.8*
Expectations for Postsecondary Education	-3.8*	-10.2*	6.5*	-3.6*	-6.6*
Simple Average	-2.9	-6.9	4.0	-1.4	-4.5

Notes: All values are teacher-weighted averages of the school-level survey Measures. Measures are coded by the survey administrators so that more positive values always indicate better working conditions. Empty cells indicate that for the Measure indicated by the row, separate values are not available in both years indicated by the column.

* indicates the change in the Measure over the given time period is statistically significant at the 5 percent level. The tests for statistical significance are regression-based and account for district-level clustering. We do not report on statistical significance for the averages in the bottom row of the table.

Table 4. Changes in teacher working conditions for schools and districts that differ by socioeconomic conditions, 2019 to 2023.

	School Neighborhood Poverty IPR(130)		School Share Black		District Median Household Income	
	High SES	Low SES	High SES	Low SES	High SES	Low SES
	2019-2023	2019-2023	2019-2023	2019-2023	2019-2023	2019-2023
Level of Classroom Disruptions	-26.9*	-23.6*	-26.9*	-24.1*	-27.2*	-23.3*
Collaborative Practices	-4.2	-6.3	-4.1	-5.9	-4.1*	-6.7*
Collective Responsibility	-9.5	-9.4	-9.0	-9.7	-9.6	-9.4
Teacher Influence	-2.7	-2.2	-2.4	-2.5	-3.0	-2.0
Innovation	-10.2	-10.5	-10.0	-10.6	-10.4	-10.4
Instructional Leadership	-4.0	-4.1	-2.9*	-5.0*	-4.2	-4.2
Program Coherence	-3.6	-3.2	-3	-3.7	-4.3	-2.5
Parent Influence on Decision Making in Schools	3.3*	1.1*	3.7*	1.2*	3.7*	0.3*
Parent Involvement in School	-3.4	-3.9	-3.2	-4.0	-3.3	-4.3
Student Responsibility	-10.5	-10.0	-9.9	-10.5	-10.4	-10.3
Quality Professional Development	-5.3	-6.5	-4.6*	-6.8*	-5.6	-6.5
Reflective Dialogue	-8.0	-8.3	-7.0*	-9.1*	-7.9	-8.7
School Commitment	-10.4*	-8.2*	-9.8	-9.1	-11.0*	-7.6*
Quality of Student Discussions	-13.5*	-11.2*	-12.6	-12.3	-13.9*	-10.9*
Socialization of New Teachers	1.6	0.6	1.8	0.7	1.0	1.0
Teacher-Parent Trust	-8.1*	-5.9*	-7.8	-6.4	-8.5*	-5.5*
Teacher-Principal Trust	-3.3	-3.7	-2.4*	-4.3*	-3.7	-3.5
Teacher-Teacher Trust	-4.1	-5.0	-3.9	-4.9	-4.1	-5.1
Teacher Safety	-8.1*	-4.3*	-8.0*	-4.9*	-9.1*	-3.2*
Expectations for Postsecondary Education	-10.6	-10.2	-10.8	-9.9	-10.7	-10.0
Simple Average	-7.1	-6.7	-6.6	-7.1	-7.3	-6.6

Notes: All values are teacher-weighted averages of the school-level survey Measures. Schools are divided into high- and low-SES groups at the median value of each indicator of socioeconomic status. IPR(130) and the share of Black students are school-level variables and median household income is a district variable.

For the latter, we merged in district-level data and calculated the median value across schools to categorize them as above- or below-median.

* indicates the change at high-SES schools is statistically different from the change at low-SES schools at the 5 percent level. The tests for statistical significance are regression-based and account for district-level clustering. We do not report on statistical significance for the averages in the bottom row of the table.

Table 5. Changes in teacher working conditions by districts' primary mode of instruction during the 2020-21 school year, 2019 to 2023.

	In-person 2019-2023	Hybrid 2019-2023	Online 2019-2023
Level of Classroom Disruptions	-24.0	-25.7	-25.6
Collaborative Practices	-1.7	-3.5	-8.7*
Collective Responsibility	-8.6	-8.8	-10.6
Teacher Influence	-1.0	-2.7*	-3.0*
Innovation	-9.0	-9.9	-11.6
Instructional Leadership	-2.3	-3.8	-5.6*
Program Coherence	-3.7	-4.0	-3.3
Parent Influence on Decision Making in Schools	7.0	4.0*	-1.7*
Parent Involvement in School	-0.4	-2.7	-5.9*
Student Responsibility	-7.5	-9.5	-12.3*
Quality Professional Development	-2.4	-5.5*	-8.6*
Reflective Dialogue	-5.6	-7.7	-10.3*
School Commitment	-8.8	-10.2	-9.0
Quality of Student Discussions	-8.8	-12.6*	-14.6*
Socialization of New Teachers	4.5	1.0*	0.1*
Teacher-Parent Trust	-4.9	-7.5	-7.4
Teacher-Principal Trust	-2.5	-3.2	-4.2
Teacher-Teacher Trust	-3.4	-3.6	-5.8*
Teacher Safety	-5.9	-7.3	-5.4
Expectations for Postsecondary Education	-7.4	-10.1	-11.7
Simple Average	-4.8	-6.7	-8.3

Notes: All values are teacher-weighted averages of the school-level survey Measures. Schools are divided into groups based on the primary mode of instruction in their districts during the 2020-21 school year.

* indicates the change for hybrid or online learning (columns 2 and 3) is statistically different from the change for in-person learning (column 1) at the 5 percent level. The tests for statistical significance are regression-based and account for district-level clustering. We do not report on statistical significance for the averages in the bottom row of the table.

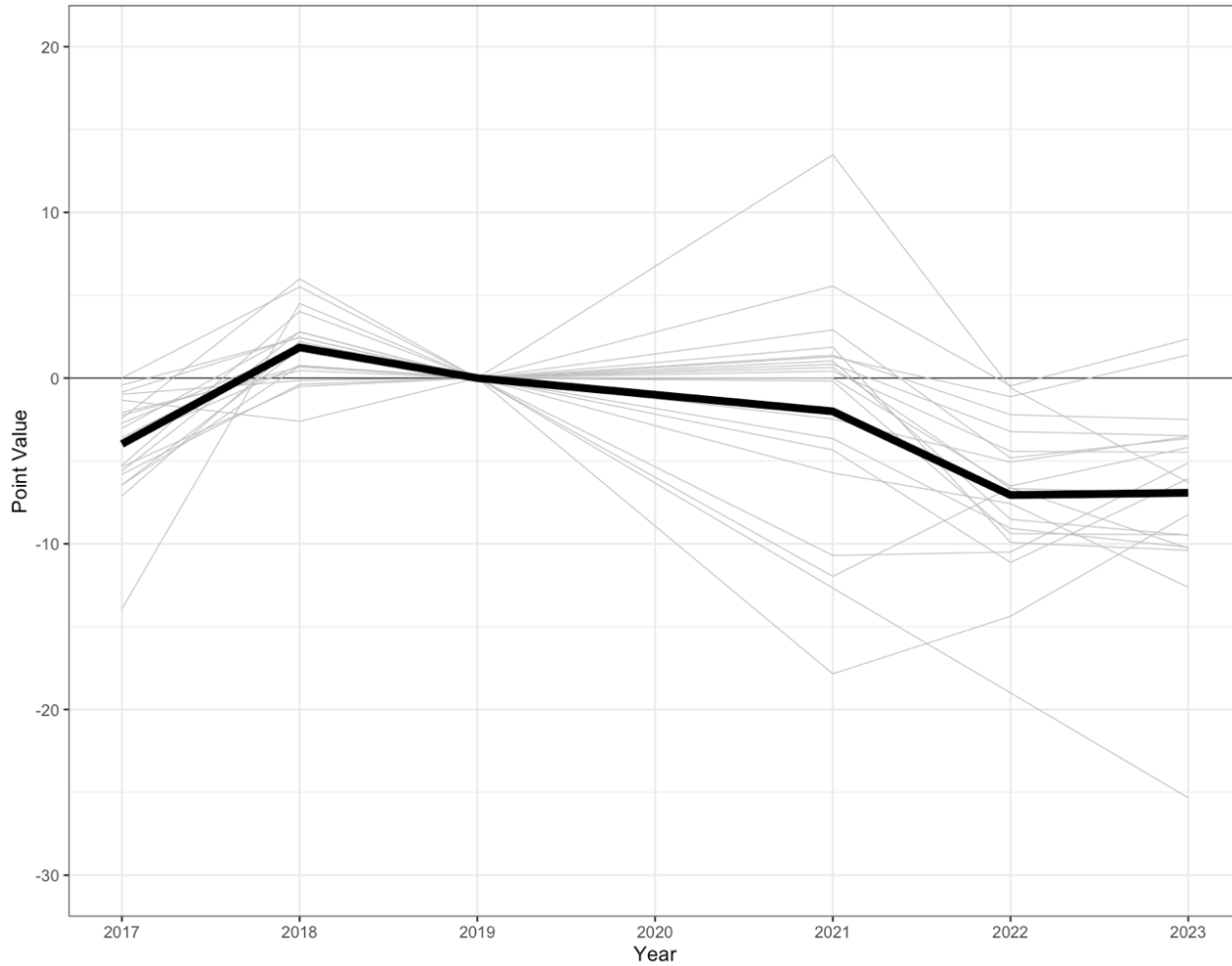
Table 6. Results from regressions of the change in teacher working conditions from 2019 to 2023, averaged over the 20 5E Survey Measures, on school and district characteristics.

	1	2	3	4	5
IPR(130)	1.45 (2.05)				-4.23 (2.42)
Share of black students		0.32 (0.91)			0.87 (1.01)
Median Household Income (in \$1,000s)			-0.07* (0.01)		-0.08* (0.01)
Share of 2020-21 AY spent online				-3.44* (1.13)	-4.21* (1.16)
Share of 2020-21 AY spent hybrid				-1.58 (1.07)	-1.56 (1.06)
N	3251	3246	3149	3251	3144

Notes: Regressions are teacher-weighted and the standard errors are clustered by district. Data for IPR(130) and the share of Black students are from 2019. District median household income from the EDGE data and based on the American Community Survey over the years 2017 to 2021. Mode-of-instruction data are based on data from the 2020-21 school year. The small differences in the sample size going across the rows of the table reflect data availability for the independent variables.

* indicates coefficient is statistically significant at the 5 percent level.

Figure 1. Visualization of trends in teacher working conditions from 2017 to 2023; 2019 is standardized to zero for each Measure.



Notes: When a value is missing in a year for a Measure, we linearly interpolate using available data. This includes 2020, when the 5E Survey was not administered for any Measure and thus all values are missing. This visualization is useful for showing the larger picture but is not designed to be informative about individual Measures. For information about trends in individual Measures, see Table 3.

Appendix A. Data Adjustments and Exploration

Appendix Table A1. Comparison to federal data of the shares of Illinois students who are Black and living at or below 130 percent of the poverty line in schools sampled by the 5E Survey in each year, with and without data reweighting in 2017 and 2018.

Year	Implied high-poverty share in 5E Survey	High-poverty share in all Illinois schools	Reweight high-poverty share in 5E Survey	Implied Black share in 5E Survey	Black share in all Illinois schools (CCD)	Reweight Black share in 5E Survey
2023	0.307	0.306	N/A	0.164	0.164	N/A
2022	0.308	0.307	N/A	0.165	0.165	N/A
2021	0.307	0.307	N/A	0.164	0.164	N/A
2019	0.308	0.309	N/A	0.164	0.166	N/A
2018	0.325	0.306	0.295	0.224	0.168	0.121
2017	0.295	0.312	0.322	0.118	0.170	0.172

Notes: Due to the disruption caused by the COVID pandemic, the 5E Survey was not administered in 2020. High-poverty students are students living at or below 130 percent of the poverty line. We estimate the shares of high-poverty students using NCES school neighborhood poverty data for schools in the Common Core of Data, modified following Fazlul, Koedel, and Parsons (2023). We refer to these estimates as IPR(130) and describe them in the main text. The share of Black students is taken from the Common Core of Data in each year. The “implied” shares in the 5E Survey dataset are based on our calculations after merging the Common Core of Data with the 5E Survey dataset in each year and are teacher weighted averages of schools present in the 5E data. The shares for all Illinois schools are similarly calculated, but for all schools in Illinois in the Common Core of Data and weighted by student enrollment. For the years 2019 to 2023, the 5E Survey Dataset and the Common Core of Data are a very close match because the 5E Survey was nearly universally administered in these years. In 2017 and 2018, the numbers do not match as well; the 5E Survey in those years is a partial sample of schools. The “reweighted” shares follow the procedure we describe in this appendix to reweight the 2017 and 2018 5E Survey data to make the data more representative of all Illinois schools along these dimensions. We use the reweighted data from 2017 and 2018 throughout our analysis in the main text.

Appendix Table A2. Standard Deviations for each Measure in the 2019 data, for full 2019 5E sample and the subsample of schools also present in 2014, 2015, and 2016.

	2019 Full Sample	2014 Subsample		2015 Subsample		2016 Subsample	
	Standard Deviations	Standard Deviations	Ratio	Standard Deviations	Ratio	Standard Deviations	Ratio
Level of Classroom Disruptions	21.9	21.8	1.0	22.1	1.0	23.5	0.9
Collaborative Practices	25.5	25.6	1.0	25.6	1.0	24.0	1.1
Collective Responsibility	21.7	21.5	1.0	21.7	1.0	21.2	1.0
Teacher Influence	11.9	11.8	1.0	11.9	1.0	11.5	1.0
Innovation	24.7	24.6	1.0	24.8	1.0	23.0	1.1
Instructional Leadership	22.2	22.1	1.0	22.2	1.0	21.6	1.0
Program Coherence	20.1	20.0	1.0	20.1	1.0	19.7	1.0
Parent Influence on Decision Making in Schools	21.6	21.5	1.0	21.7	1.0	20.0	1.1
Parent Involvement in School	21.1	20.9	1.0	21.2	1.0	20.9	1.0
Student Responsibility	22.7	22.2	1.0	22.9	1.0	23.8	1.0
Quality Professional Development	23.0	23.3	1.0	23.0	1.0	21.4	1.1
Reflective Dialogue	24.0	24.2	1.0	24.1	1.0	22.2	1.1
School Commitment	20.5	20.3	1.0	20.6	1.0	20.9	1.0
Quality of Student Discussions	24.6	24.6	1.0	24.9	1.0	24.5	1.0
Socialization of New Teachers	23.8	23.2	1.0	23.8	1.0	21.7	1.1
Teacher-Parent Trust	24.5	24.2	1.0	24.6	1.0	24.4	1.0
Teacher-Principal Trust	19.0	19.1	1.0	18.9	1.0	19.5	1.0
Teacher-Teacher Trust	20.8	20.5	1.0	20.9	1.0	19.5	1.1
Teacher Safety	20.1	19.8	1.0	20.2	1.0	21.1	1.0
Expectations for Postsecondary Ed	19.0	19.1	1.0	19.0	1.0	16.2	1.2

Notes:. Standard-deviation ratios close to 1.0 throughout this table suggest the benchmarking is likely to be roughly accurate for the full 2013 distribution of Illinois schools.

Appendix B. List of Items in Each 5E Survey Measure

Appendix Table B1. Items in each 5E Survey Measure. Measures are listed in the same order as in Table 2 in the main text.

Survey Measure	Survey Item
Level of Classroom Disruptions	How many of the students in your class regularly refuse to respond when addressed?
	How many of the students in your class regularly use inappropriate language during class?
	How many of the students in your class regularly threaten you verbally?
	How many of the students in your class regularly do off-task things (e.g., play games, text, talk on cell phone) during instructional time?
	How many of the students in your class regularly create serious behavior problems in your class?
Collaborative Practices	This school year, how often have you observed another teacher's class to offer feedback?
	This school year, how often have you observed another teacher's class to get ideas for your own instruction?
	This school year, how often have you gone over student assessment data with other teachers to make instructional decisions?
	This school year, how often have you worked with other teachers to develop materials or activities for particular classes?
	This school year, how often have you worked on instructional strategies with other teachers?
Collective Responsibility	How many teachers in this school take responsibility for improving the school?
	How many teachers in this school feel responsible to help each other do their best?
	How many teachers in this school feel responsible that all students learn?
	How many teachers in this school feel responsible for helping students develop self-control?
	How many teachers in this school feel responsible when students in this school fail?
Teacher Influence	How much influence do teachers have over: Planning how discretionary school funds should be used.
	How much influence do teachers have over: Determining which books and other instructional materials are used in classrooms.
	How much influence do teachers have over: Establishing the curriculum and instructional program.
	How much influence do teachers have over: Determining the content of in-service programs.
Innovation	How much influence do teachers have over: Setting standards for student behavior.
	How many teachers in this school are really trying to improve their teaching?
	How many teachers in this school are willing to take risks to make the school better?
	How many teachers in this school are eager to try new ideas?
Instructional Leadership	Please indicate the extent to which you disagree or agree with the following: In this school, teachers are continually learning and seeking new ideas.
	Please indicate the extent to which you disagree or agree with the following: A member of the school leadership team makes clear to the staff the leadership's expectations for meeting instructional goals.
	Please indicate the extent to which you disagree or agree with the following: A member of the school leadership team communicates a clear vision for our school.
	Please indicate the extent to which you disagree or agree with the following: A member of the school leadership team presses teachers to implement what they have learned in professional development.
	Please indicate the extent to which you disagree or agree with the following: A member of the school leadership team knows what's going on in my classroom.
	Please indicate the extent to which you disagree or agree with the following: A member of the school leadership team provides me with useful feedback to improve my teaching.

	Please indicate the extent to which you disagree or agree with the following: A member of the school leadership team has provided me with the support I need to improve my teaching.
Program Coherence	To what extent do you disagree or agree with the following: Once we start a new program in this school, we follow up to make sure that it's working.
	To what extent do you disagree or agree with the following: Curriculum, instruction, and learning materials are well coordinated across different grade levels at this school.
	To what extent do you disagree or agree with the following: There is consistency in curriculum, instruction, and learning materials among teachers in the same grade level at this school.
	To what extent do you disagree or agree with the following: We have so many different programs in this school/center that I can't keep track of them all.
	To what extent do you disagree or agree with the following: Many special programs come and go at this school.
Parent Influence on Decision Making in School	To what extent does this school involve parents/guardians in the development of programs aimed at improving students' academic outcomes?
	To what extent does this school involve parents/guardians in commenting on school curricula?
	To what extent does this school include parent leaders from all backgrounds in school improvement efforts?
	To what extent does this school develop formal networks to link all families with each other (e.g., sharing parent directories, providing a website for parents/guardians to connect with one another, etc.)?
	To what extent does this school encourage more involved parents/guardians to reach out to less involved parents/guardians?
Parent Involvement in School	For the students you teach this year, how many of their parents/guardians attended parent-teacher conferences when you requested them?
	For the students you teach this year, how many of their parents/guardians volunteered time to support the school (e.g., volunteer in classrooms, help with school-wide events, etc.)?
	For the students you teach this year, how many of their parents/guardians contacted you about their child's performance?
	For the students you teach this year, how many of their parents/guardians responded to your suggestions for helping their child?
Student Responsibility	How many of the students in your {specific} class come to class on time?
	How many of the students in your {specific} class attend class regularly?
	How many of the students in your {specific} class come to class prepared with the appropriate supplies and books?
	How many of the students in your {specific} class regularly pay attention in class?
	How many of the students in your {specific} class actively participate in class activities?
	How many of the students in your {specific} class always turn in their homework?
Quality Professional Development	Please indicate the extent to which you disagree or agree with the following: Overall, my professional development experiences this year have been sustained and coherently focused, rather than short-term and unrelated.
	Please indicate the extent to which you disagree or agree with the following: Overall, my professional development experiences this year have included enough time to think carefully about, try, and evaluate new ideas.
	Please indicate the extent to which you disagree or agree with the following: Overall, my professional development experiences this year have been closely connected to my school's improvement plan.
	Please indicate the extent to which you disagree or agree with the following: Overall, my professional development experiences this year have included opportunities to work productively with colleagues in my school.
	Please indicate the extent to which you disagree or agree with the following: Overall, my professional development experiences this year have included opportunities to work productively with teachers from other schools.

Reflective Dialogue	Please indicate the extent to which you disagree or agree with the following: Teachers talk about instruction in the teachers' lounge, faculty meetings, etc.
	Please indicate the extent to which you disagree or agree with the following: Teachers in this school share and discuss student work with other teachers.
School Commitment	Please indicate the extent to which you disagree or agree with the following: I usually look forward to each working day at this school.
	Please indicate the extent to which you disagree or agree with the following: I wouldn't want to work in any other school.
	Please indicate the extent to which you disagree or agree with the following: I feel loyal to this school.
	Please indicate the extent to which you disagree or agree with the following: I would recommend this school to parents seeking a place for their child.
Quality of Student Discussions	In discussions that occur in your {specific} class, how often does the following occur? Students build on each other's ideas during discussion.
	In discussions that occur in your {specific} class, how often does the following occur? Students use data and text references to support their ideas.
	In discussions that occur in your {specific} class, how often does the following occur? Students show each other respect.
	In discussions that occur in your {specific} class, how often does the following occur? Students provide constructive feedback to their peers and to me.
	In discussions that occur in your {specific} class, how often does the following occur? Most students participate in the discussion at some point.
Socialization of New Teachers	Please indicate the extent to which you disagree or agree with the following: Experienced teachers invite new teachers into their classes to observe, give feedback, etc.
	Please indicate the extent to which you disagree or agree with the following: A conscious effort is made by faculty to make new teachers feel welcome here.
	How many teachers are assigned a mentor teacher when they first begin working at this school?
Teacher-Parent Trust	How many teachers in this school feel good about parents' support for their work?
	For the students you teach this year, how many of their parents/guardians support your teaching efforts?
	For the students you teach this year, how many of their parents/guardians do their best to help their children learn?
	To what extent do you feel respected by the parents of your students?
	Please indicate the extent to which you disagree or agree with the following: Teachers and parents at this school think of each other as partners in educating children.
	Please indicate the extent to which you disagree or agree with the following: Staff at this school work hard to build trusting relationships with parents.
Teacher-Principal Trust	To what extent do you feel respected by your principal?
	Please indicate the extent to which you disagree or agree with the following: The principal has confidence in the expertise of the teachers
	Please indicate the extent to which you disagree or agree with the following: I trust the principal at his or her word.
	Please indicate the extent to which you disagree or agree with the following: It's OK in this school to discuss feelings, worries, and frustrations with the principal.
	Please indicate the extent to which you disagree or agree with the following: The principal takes a personal interest in the professional development of teachers.

	Please indicate the extent to which you disagree or agree with the following: The principal looks out for the personal welfare of the faculty members.
	Please indicate the extent to which you disagree or agree with the following: The principal places the needs of children ahead of personal and political interests.
	Please indicate the extent to which you disagree or agree with the following: The principal at this school is an effective manager who makes the school run smoothly.
Teacher-Teacher Trust	To what extent do you feel respected by other teachers at this school?
	Please indicate the extent to which you disagree or agree with the following: Teachers in this school trust each other.
	Please indicate the extent to which you disagree or agree with the following: It's OK in this school to discuss feelings, worries, and frustrations with other teachers.
	Please indicate the extent to which you disagree or agree with the following: Teachers respect other teachers who take the lead in school improvement efforts.
	Please indicate the extent to which you disagree or agree with the following: Teachers at this school respect those colleagues who are experts at their craft.
Teacher Safety	To what extent is the following a problem at your school: Physical conflicts among students
	To what extent is the following a problem at your school: Robbery or theft
	To what extent is the following a problem at your school: Gang activity
	To what extent is the following a problem at your school: Disorder in classrooms
	To what extent is the following a problem at your school: Disorder in hallways
	To what extent is the following a problem at your school: Student disrespect of teachers
	To what extent is the following a problem at your school: Threats of violence toward teachers
Expectations for Postsecondary Education	Please indicate the extent to which you disagree or agree with the following: Teachers expect most students in this school to go to college.
	Please indicate the extent to which you disagree or agree with the following: Teachers at this school help students plan for college outside of class time.
	Please indicate the extent to which you disagree or agree with the following: The curriculum at this school is focused on helping students get ready for college.
	Please indicate the extent to which you disagree or agree with the following: Most of the students in this school are planning to go to college.
	Please indicate the extent to which you disagree or agree with the following: Teachers in this school feel that it is a part of their job to prepare students to succeed in college.

Notes: Individual survey items are the items used on the 2023 5E Survey.

Appendix C. Supplementary Tables

Appendix Table C1. Illinois context

	Illinois Average	National Average
Student Characteristics (2018-19 School Year)		
Percent Asian	5.0	5.3
Percent Black	16.7	15.1
Percent Hispanic	26.7	27.2
Percent White	47.2	47.0
Percent Other	4.1	5.5
School Characteristics (2018-19 School Year)		
Percent of Enrollment in Charter Schools	3.2	6.5
Percent of Students \leq 130 Percent of Poverty Line	31.1	32.0
District Characteristics (2018-19 School Year)		
Median Household Income	\$54,500	\$65,700
District Modes of Instruction (2020-21 School Year)		
Percent Time in In-Person Learning	23.8	38.5
Percent Time in Hybrid Learning	41.2	33.8
Percent time in Online Learning	35.1	27.7
N (Public K-12 Students)	1,891,730	50,694,061

Notes: The data for this table are taken from the Common Core of Data, the National Center for Education Statistics' Education Demographic and Geographic Estimates (EDGE) program, Fazlul, Koedel, and Parsons (2023), and the COVID-19 School Data Hub. The data are from the 2018-19 school year, except for mode of instruction, which is from the 2020-21 school year. The fraction of students living at or below 130 percent of the poverty line is estimated based on School Neighborhood Poverty data from the National Center for Education Statistics, following Fazlul, Koedel, and Parsons (2023). School- and district-level summary statistics are weighted by student enrollment.

Appendix Table C2. Replication of Table 3 using unweighted school data.

	Full Panel	During & After the Pandemic	2-Year Windows		
	2017-2023	2019-2023	2017-2019	2019-2021	2021-2023
Level of Classroom Disruptions	-10.9*	-24.7*	13.8*		
Collaborative Practices	1.2	-4.9*	6.0*	-10.5*	5.7*
Collective Responsibility	-6.3*	-9.1*	2.8*	0.8	-9.9*
Teacher Influence	-0.3	-1.8*	1.5*	1.4*	-3.2*
Innovation	-10.2*	-10.2*	-0.1	1.4*	-11.5*
Instructional Leadership	1.4	-2.6*	4.0*	0.2	-2.8*
Program Coherence	3.0*	-2.8*	5.8*	2.9*	-5.7*
Parent Influence on Decision Making in Schools	3.8*	3.4*	0.4	6.0*	-2.6*
Parent Involvement in School	3.5*	-2.8*	6.3*	-2.2*	-0.6
Student Responsibility	-9.6*	-9.7*	0	-10.0*	0.3
Quality Professional Development	1.9*	-4.7*	6.7*	-4.8*	0.1
Reflective Dialogue	-4.5*	-8.0*	3.5*	-17.5*	9.5*
School Commitment	-6.4*	-8.4*	2.0*	0.2	-8.6*
Quality of Student Discussions	-8.5*	-11.2*	2.8*	-2.4*	-8.9*
Socialization of New Teachers	4.1*	2.4*	1.8*	1.5*	0.9
Teacher-Parent Trust	-1.4	-6.0*	4.6*	1.4*	-7.4*
Teacher-Principal Trust	-1.9*	-3.0*	1.1	0.7	-3.7*
Teacher-Teacher Trust	1.4*	-3.9*	5.3*	0.5	-4.4*
Teacher Safety	-2.4*	-5.2*	2.8*	14.2*	-19.4*
Expectations for Postsecondary Education	-3.3*	-9.4*	6.1*	-3.5*	-5.9*
Simple Average	-2.3	-6.1	3.9	-1.0	-4.1

Notes: These results are unweighted. The results in Table 3 are teacher-weighted to reflect the experience of the average teacher in the Survey dataset. These unweighted results reflect the teacher experience in the average school, which implicitly upweights working conditions in small schools relative to Table 3. Measures are coded by the survey administrators so that more positive values always indicate better working conditions. Empty cells indicate that for the Measure indicated by the row, separate values are not available in both years indicated by the column.

* indicates the change in the Measure over the given time period is statistically significant at the 5 percent level. The tests for statistical significance are regression-based and account for district-level clustering. We do not report on statistical significance for the averages in the bottom row of the table.

Appendix Table C3. Model-based estimates of teacher working condition trends using Equation (1) in the main text. These results can be compared to the results in Table 3 (see table notes).

	Pre-Pandemic Years		Pandemic and Post-Pandemic Years		
	2017	2018	2021	2022	2023
Level of Classroom Disruptions	-13.9*	4.5*			-25.3*
Collaborative Practices	-5.6	2.8*	-10.7*	-10.5*	-5.1*
Collective Responsibility	-2.7	1.7	1.0*	-8.5*	-9.5*
Teacher Influence	-2.1*	0.5	1.4*	-2.2*	-2.5*
Innovation	-0.4	2.5*	1.9*	-9.9*	-10.4*
Instructional Leadership	-3.9	0.8	0	-6.5*	-4.2*
Program Coherence	-5.8*	-0.4	2.9*	-4.8*	-3.6*
Parent Influence on Decision Making in Schools	-0.8	2.5	5.6*	-0.5	2.4
Parent Involvement in School	-7.1*	2.2	-2.5*	-5.1*	-3.5*
Student Responsibility	0	5.5*	-12.0*	-6.6*	-10.3*
Quality Professional Development	-6.4*	0.7	-4.3*	-11.1*	-6.1*
Reflective Dialogue	-3.6	1.9*	-17.8*	-14.4*	-8.2*
School Commitment	-2.2*	0.7	-0.2	-9.4*	-9.5*
Quality of Student Discussions	-2.4	6.0*	-5.7*	-7.6*	-12.6*
Socialization of New Teachers	-1.3	-2.6*	1.3*	-1.1	1.4
Teacher-Parent Trust	-5.3*	4.0*	0.6	-6.7*	-6.9*
Teacher-Principal Trust	-1.0	-0.1	0.8	-3.2*	-3.5*
Teacher-Teacher Trust	-5.4*	-0.5	0.4	-4.4*	-4.5*
Teacher Safety	-3.0*	2.8*	13.5*	-0.6	-6.3*
Expectations for Postsecondary Education	-6.5*	1.7	-3.6*	-9.1*	-10.2*
Simple Average of Coefficient Values	-4.0	1.9	-1.4	-6.4	-6.9

Notes: Coefficients on year indicator variables relative to 2019 (the omitted year) are reported. Measures are coded by the survey administrators so that more positive values always indicate better working conditions. Empty cells indicate that for the Measure indicated by the row, values are not available in the years indicated by the column.

Interpretation: Given that these estimates are relative to 2019, a quick way to see the similarity of results compared to Table 3 in the main text is to compare the coefficients from the 2021 and 2023 columns here to the results in Table 3 over the periods 2019-2021 and 2019-2023.

* indicates the value of the Measure is statistically different from the value in 2019 at the 5 percent level (standard errors are suppressed). We do not report on statistical significance for the averages in the bottom row of the table.

Appendix Table C4. Model-based estimates of teacher working condition trends using Equation (2) in the main text, which includes school fixed effects. These results can be compared to the results in Table 3 (see table notes).

	Pre-Pandemic Years		Pandemic and Post-Pandemic Years		
	2017	2018	2021	2022	2023
Level of Classroom Disruptions	-10.6*	3.0*			-25.7*
Collaborative Practices	-3.4*	0.5	-10.7*	-10.8*	-5.3*
Collective Responsibility	-0.3	0.4	0.8	-8.6*	-9.7*
Teacher Influence	-0.4	-0.3	1.3*	-2.2*	-2.5*
Innovation	3.5*	0.5	1.6*	-10.1*	-10.8*
Instructional Leadership	-1.3*	-1.0	-0.4	-6.9*	-4.6*
Program Coherence	-2.8*	-1.1	2.8*	-4.8*	-4.0*
Parent Influence on Decision Making in Schools	2.5	0.3	5.3*	-0.9	2.0
Parent Involvement in School	-1.5*	0.1	-2.7*	-5.4*	-4.1*
Student Responsibility	4.1*	4.2*	-11.8*	-6.6*	-10.6*
Quality Professional Development	-2.6*	-1.2	-4.6*	-11.4*	-6.5*
Reflective Dialogue	-0.6	0.1	-18.1*	-14.7*	-8.6*
School Commitment	0.1	-0.1	-0.3	-9.5*	-9.9*
Quality of Student Discussions	3.5*	3.9*	-5.6*	-7.5*	-12.9*
Socialization of New Teachers	-2.6*	-1.9*	0.8	-1.7	0.8
Teacher-Parent Trust	1.2*	1.1*	0.3	-7.1*	-7.6*
Teacher-Principal Trust	-0.1	-0.1	0.7	-3.5*	-3.8*
Teacher-Teacher Trust	-2.9*	-1.5*	0.2	-4.5*	-4.9*
Teacher Safety	0	2.0*	13.6*	-0.6	-6.6*
Expectations for Postsecondary Education	0.4	0.9*	-3.5*	-8.8*	-10.2*
Simple Average	-0.7	0.5	-1.6	-6.6	-7.3

Notes: Coefficients on year indicator variables relative to 2019 (the omitted year) are reported. Measures are coded by the survey administrators so that more positive values always indicate better working conditions. Empty cells indicate that for the Measure indicated by the row, values are not available in the years indicated by the column.

Interpretation: Given that these estimates are relative to 2019, a quick way to see the similarity of results compared to Table 3 in the main text is to compare the coefficients from the 2021 and 2023 columns here to the results in Table 3 over the periods 2019-2021 and 2019-2023.

* indicates the value of the Measure is statistically different from the value in 2019 at the 5 percent level (standard errors are suppressed). We do not report on statistical significance for the averages in the bottom row of the table.

Appendix Table C5. Replication of Table 3 using the restricted sample of schools with 5E Survey data in 2017. All other schools are dropped from the sample.

	Full Panel	During & After the Pandemic	2-Year Windows		
	2017-2023	2019-2023	2017-2019	2019-2021	2021-2023
Level of Classroom Disruptions	-14.8*	-25.1*	10.3*		
Collaborative Practices	-0.7	-3.1*	2.4*	-9.3*	6.2*
Collective Responsibility	-9.0*	-8.5*	-0.5	0.9	-9.4*
Teacher Influence	-1.5*	-2.3*	0.7	1.0*	-3.3*
Innovation	-13.2*	-9.4*	-3.8*	2.0*	-11.3*
Instructional Leadership	-2.1*	-3.2*	1.1	-0.1	-3.1*
Program Coherence	-0.6	-3.5*	2.8*	3.4*	-6.9*
Parent Influence on Decision Making in Schools	1.1	4.8*	-3.7*	7.7*	-2.9*
Parent Involvement in School	-0.9	-2.1*	1.3*	-2.1*	0
Student Responsibility	-13.9*	-9.2*	-4.7*	-10.6*	1.4
Quality Professional Development	-2.4*	-4.9*	2.5*	-4.7*	-0.2
Reflective Dialogue	-7.3*	-7.6*	0.3	-17.2*	9.6*
School Commitment	-9.9*	-9.8*	0	-1.1	-8.8*
Quality of Student Discussions	-15.6*	-11.4*	-4.2*	-5.1*	-6.3*
Socialization of New Teachers	4.0*	2.6*	1.5*	2*	0.6
Teacher-Parent Trust	-7.9*	-6.4*	-1.5	0.1	-6.4*
Teacher-Principal Trust	-3.0*	-3.1*	0.2	0.3	-3.4*
Teacher-Teacher Trust	-1.1*	-3.3*	2.2*	1.0	-4.3*
Teacher Safety	-8.9*	-6.7*	-2.2*	19.5*	-26.3*
Expectations for Postsecondary Education	-9.9*	-8.8*	-1.1	-3.1*	-5.7*
Simple Average	-5.9	-6.1	0.2	-0.8	-4.2

Notes: All values are teacher-weighted averages of the school-level survey Measures. Measures are coded by the survey administrators so that more positive values always indicate better working conditions. Empty cells indicate that for the Measure indicated by the row, separate values are not available in both years indicated by the column. Schools included in this table are those with data in the 2017 5E Survey dataset.

* indicates the change in the Measure over the given time period is statistically significant at the 5 percent level. We do not report on statistical significance for the averages in the bottom row of the table.

Appendix Table C6. Trends in the non-focal Measures on the 5E Survey, which are based on student-directed items.

	Full Panel	During & After the Pandemic	2-Year Windows		
	2017-2023	2019-2023	2017-2019	2019-2021	2021-2023
Peer Support for Academic Work	3.7*	-1.9*	5.6*	16.3*	-18.1*
Course Clarity		-6.3*		6.3*	-12.6*
Emotional Health			-1.8		
Academic Engagement	-1.5	0.2	-1.7	4.2*	-4.0*
English Instruction	10.2*	3.2*	7.0*	-2.7*	6.0*
Importance of High School for the Future	-3.4*	-3.8*	0.4	-11.2*	7.4*
Grit			-9.5*		
Human & Social Resources in the Community	4.2*	2.1*	2.1*	6.9*	-4.8*
Math Instruction	-1.3	-3.5*	2.2*	-13.6*	10.1*
Student Peer Relationships	-6.1*	-9.3*	3.2*	24.0*	-33.3*
Academic Personalism	5.4*	-2.7*	8.2*	7.5*	-10.2*
Academic Press	-2.6*	-7.9*	5.3*	-6.5*	-1.4*
Parent Supportiveness		-19.7*		-14.9*	-4.9*
School Connectedness			-0.8		
Classroom Rigor	13.6*	5.9*	7.7*	9.0*	-3.1*
Safety	-7.3*	-9.5*	2.2*	1.7*	-11.2*
Science Instruction	5.8*	1.6*	4.1*	-12.7*	14.3*
School-Wide Future Orientation	0.6	-2.1*	2.7*	1.9*	-4.0*
School Safety			2.6*		
Rigorous Study Habits	1.1	6.1*	-4.9*	17.8*	-11.7*
Student-Teacher Trust	-2.5*	-12.6*	10.1*	7.0*	-19.6*
Simple Average	1.3	-3.5	2.4	2.4	-6.0

Notes: The values in this table are student-weighted because students answered these survey questions. Measures are coded by the survey administrators so that more positive values always indicate better conditions. Empty cells indicate that for the Measure indicated by the row, separate values are not available in both years indicated by the column.

* indicates the change in the Measure over the given time period is statistically significant at the 5 percent level. The tests for statistical significance are regression-based and account for district-level clustering. We do not report on statistical significance for the averages in the bottom row of the table.

Appendix Table C7. Changes in teacher working conditions during and after the pandemic, separately in Chicago Public Schools and other Illinois school districts.

	Chicago Public Schools			Other Illinois School Districts		
	During & After the Pandemic	During the Pandemic	After the Pandemic	During & After the Pandemic	During the Pandemic	After the Pandemic
	2019-2023	2019-2021	2021-2023	2019-2023	2019-2021	2021-2023
Level of Classroom Disruptions	-25.6*			-25.3*		
Collaborative Practices	-16.1*	-19.6*	3.5*	-2.8*	-8.8*	6.0*
Collective Responsibility	-14.2*	2.3*	-16.5*	-8.5*	0.8	-9.3*
Teacher Influence	-4.2*	3.1*	-7.3*	-2.2*	1.0*	-3.2*
Innovation	-16.4*	0.9	-17.3*	-9.2*	2.1*	-11.3*
Instructional Leadership	-8.8*	0.3	-9.1*	-3.3*	0	-3.2*
Program Coherence	-4.7*	1.4	-6.2*	-3.5*	3.2*	-6.7*
Parent Influence on Decision Making in Schools	-9.0*	-2.7*	-6.3*	4.7*	7.3*	-2.6*
Parent Involvement in School	-10.8*	-3.9*	-6.9*	-2.0*	-2.1*	0.1
Student Responsibility	-15.9*	-20.3*	4.4*	-9.1*	-10.2*	1.1
Quality Professional Development	-13.5*	-5.2*	-8.3*	-4.6*	-4.1*	-0.4
Reflective Dialogue	-13.4*	-22.2*	8.8*	-7.2*	-16.9*	9.7*
School Commitment	-8.5*	3.5*	-12*	-9.7*	-0.9	-8.7*
Quality of Student Discussions	-17.1*	-7.2*	-9.8*	-11.7*	-5.4*	-6.4*
Socialization of New Teachers	-3.4*	-0.5	-3.0*	2.5*	1.6*	0.8
Teacher-Parent Trust	-10.4*	4.1*	-14.5*	-6.2*	0	-6.2*
Teacher-Principal Trust	-5.6*	2.7*	-8.4*	-3.0*	0.4	-3.5*
Teacher-Teacher Trust	-11.0*	-2.0	-9.0*	-3.1*	0.9*	-4.1*
Teacher Safety	-4.4*	-13.5*	9.1*	-6.7*	19.1*	-25.9*
Expectations for Postsecondary Education	-13.6*	-3.7	-9.9*	-9.5*	-3.6*	-6*
Simple Average	-11.3	-4.3	-6.2	-6.0	-0.8	-4.2

Notes: All values are teacher-weighted averages of the school-level survey Measures. Measures are coded by the survey administrators so that more positive values always indicate better working conditions. Empty cells indicate that for the Measure indicated by the row, separate values are not available in both years indicated by the column. CPS did not participate in the 5E Survey in 2017 so we could not build a full pre-pandemic trend, but using data from 2018, in an analysis suppressed for brevity we show the pre-pandemic trends (from 2018 to 2019) in Chicago and other Illinois school districts were similar.

* indicates the change in the Measure over the given time period is statistically significant at the 5 percent level. We do not report on statistical significance for the averages in the bottom row of the table.