Sustaining a Sense of Success: The Protective Role of Teacher Working Conditions During the COVID-19 Pandemic

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Abstract

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Keywords: Teachers, Working Conditions, COVID-19, Student Engagement, Organizational Change, School Leadership, Equity

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Introduction

Public schools have long been characterized as inflexible and bureaucratic institutions ill-equipped to undertake rapid organizational change (Elmore, 2002; Lortie, 1975; Noguera, 2003; Payne, 2008). Although notable exceptions exist, (Chenoweth, 2020; Johnson, Reinhorn & Simon, 2017; Mehta & Fine, 2019) teachers often work in isolation, learning from individual experience in traditional classroom settings that have changed little over time (Lortie, 1975, Johnson et al., 2018; Troen & Boles, 2012). This schooling system functions, albeit imperfectly, during quiescent times. However, the limitations of this siloed organizational structure and static culture are exposed when schools attempt, or are forced, to change how they operate. The sudden shift to emergency remote teaching at the start of the COVID-19 pandemic was such a time.

The public health crisis caused by the COVID-19 virus shuttered schools across the United States starting in March, 2020, upending traditional approaches to education. Schools and teachers were forced to pivot to fully remote instruction with virtually no warning and with little, if any, technological training for teaching online. This sudden and total change in how and where teachers delivered instruction, combined with the health threats and economic consequences of the pandemic, created a uniquely stressful and demanding context for teachers' work.

In this paper, we examine the challenges teachers faced while working from home at the start of the pandemic, between March and June 2020, and we explore the role that working conditions played in supporting their sense of success in this new technology-dependent setting. In doing so, we aim to inform schools' efforts to support teachers during this extended period of

non-traditional teaching and to influence broader efforts to transform how public education is

organized and delivered. We focus our analyses on four central research questions (RQ):

> *RQ1: What challenges did the pandemic and sudden change to emergency remote teaching present for teachers?*
>
> *RQ2: How did these challenges differ across teacher and school characteristics?*
>
> *RQ3: How did the pandemic and transition to emergency remote teaching affect teachers' sense of success?*
>
> *RQ4: What role did working conditions play in sustaining teachers' sense of success during the transition to emergency remote teaching?*

We explore these questions using two waves of a working conditions survey from the fall

and spring of the 2019-2020 school year. The surveys were administered to a large and diverse

sample of teachers by Upbeat, a firm that supports partner school districts and schools with

teacher retention. For the spring administration, we used a retrospective survey design which

asked teachers to answer items based on their experiences prior to the pandemic and to respond

to additional questions specifically about teaching during the pandemic. Over 7,800 teachers

working across 10 districts and 5 charter school networks completed the spring survey. Together,

these data allow us to conduct a range of descriptive analyses; analyze how teachers' "sense of

success" (Johnson & Birkeland, 2003) changed over time; and estimate the degree to which

working conditions moderated these changes.

Our findings suggest that the sudden move to remote teaching created substantial

challenges for teachers' work and limited students' engagement in learning. Teachers at every

career phase struggled with the shift to remote teaching, but often in different ways. Mid-career

teachers—those most likely to have children at home—struggled to balance professional

responsibilities with obligations at home. Veteran teachers were much more likely to report

discomfort using the technology required for teaching remotely. In addition, we provide further

evidence that remote instruction exacerbated existing inequities by severely and disproportionately limiting learning opportunities for students in low-income and Black communities. Teachers in high-poverty schools and in schools that serve a majority of Black students reported that students were less likely to have the technology required to access online learning resources and, consequently, less likely to be able to engage in remote schooling.

Not surprisingly, teachers experienced a precipitous drop in their self-reported sense of success during the pandemic, relative to both fall baseline levels and retrospective reports from the spring before schools closed. Schools' efforts to support teachers during the crisis also appeared to matter. Our exploratory analyses suggest that schools with more supportive remote working conditions were more successful at helping their teachers maintain a sense of success during the pandemic. We find that teachers were less likely to experience declines in their sense of success when they worked in schools that communicated effectively, provided targeted professional development, recognized teachers' efforts, facilitated meaningful collaboration, and held fair expectations during the pandemic.

We make several important contributions to research, policy, and practice. First, our descriptive results complement a range of findings from other concurrent surveys, while benefitting from a substantially larger sample size and higher response rate. Thus, the descriptive patterns we present are less susceptible to potential selection bias. They also allow us to explore heterogeneity in remote learning experiences and reveal previously undetected differences.

Second, our study advances the growing literature on teachers' working conditions in schools. Our paper is among the first to document at scale how teachers experience their school's working conditions differently even within the same school. We move beyond the standard practice of averaging teachers' perceptions of their working conditions at the school level to

directly model each teachers' individual experience. We show that school environments are not a monolith. Rather, they are shaped by a dynamic set of organizational practices that can change over the academic year and are experienced in different ways by teachers in the same school.

Finally, our analyses illuminate the importance of working conditions during times of rapid organizational change. We find robust empirical evidence that teachers who worked in schools with more supportive working conditions were more likely to sustain their sense of success while navigating the shift to emergency remote teaching and the challenges caused by the pandemic. These findings demonstrate the critical role of working conditions during crisis. They also suggest that working conditions are likely to be key moderators of education reforms that necessitate substantial changes to organizational and instructional practices within schools.

Prior Literature

The Importance of Working Conditions

Working Conditions and Teachers' Sense of Success. Researchers have long understood workplace conditions to be critical to teachers' self-efficacy, satisfaction, and career decisions (Farkas et al., 2000; Johnson, 1990; Johnson and Birkeland, 2003; Murnane et al., 1991). The term "sense of success" arose out of Johnson and colleagues' (2004) seminal study of 50 new teachers in Massachusetts. Through repeated interviews with teachers conducted over two years, the team explored teachers' explanations for their decisions to stay in their schools, transfer to a different school, or leave the profession. They found that the single most important factor for teachers was their sense of efficacy—whether they "believed that they were achieving success with their students" (Johnson & Birkeland, 2003, p. 593). In describing what would keep him in teaching, one teacher articulated, "I'll need a sense of success, not unqualified constant success,

because I know that's completely unrealistic. But, overall, you know, on average, that I'm making more of a difference for kids and that they're learning from me" (p. 594).

This importance of teachers' sense of success in their decision-making aligned with decades of related research which has found teachers' own perceptions of their effectiveness to be of critical importance to teachers and consequential for students. Grounded in Rotter's (1966) locus of control theory and Bandura's (1977) social cognitive theory, a range of teacher efficacy constructs have been linked with student outcomes. A systematic review of the teacher self-efficacy literature revealed evidence of strong positive associations between teacher self-efficacy and student achievement, motivation, and students' own sense of self-efficacy (Tschannen-Moran et al., 1998). Critical for our context, the review found that teachers with greater self-efficacy are more persistent and resilient when faced with challenges and setbacks. Others have since demonstrated the positive link between teachers' collective efficacy at the organization level and a range of student outcomes (Goddard et al., 2004; Moolenaar et al., 2012).

Johnson and Birkeland (2003) illustrate how school-based factors such as principals' leadership, collaboration with colleagues, and access to resources profoundly influenced teachers' sense of success. When deciding whether to stay or leave their schools, teachers considered how these "social working conditions" either supported or thwarted their ability to teach effectively (Johnson, 1990). More recently, a growing body of quantitative studies has leveraged large-scale survey data on working conditions and consistently found that social working conditions are strongly associated with teacher satisfaction and their career choices, as well as with student academic growth (Allensworth et al., 2009; Boyd et al., 2011; Johnson et al., 2012; Ladd, 2011; Loeb et al., 2005; for a review, see Simon & Johnson, 2015). Across these

studies, the working conditions that mattered most to teachers included the principal's leadership, collegial relationships, and the school's organizational culture.

Working Conditions and Organizational Change. The extent to which a school is supportive of teachers and well-functioning as an organization can greatly influence how effectively a school pivots during times of change. School leadership is especially critical during transitions because the most basic responsibility of principals is to ensure that schools "work properly" (Bryk et al., 2010, p. 62). Grissom and Loeb (2011) identified principals' organizational management skills as a predictor of student achievement and suggested that, without attention to organizational management, principals rarely produced overall school improvement. Likewise, Reinhorn, Johnson, and Simon (2017) found that principals of successful schools deliberately craft a professional culture that promotes continuous improvement for teachers.

Studies of large-scale school reforms provide insight into the power of working conditions in school improvement efforts. In their longitudinal investigation of Chicago elementary schools over fifteen years, Bryk and colleagues (2010) developed a framework of five "essential supports" that are correlated with school improvement: (1) a coherent instructional guidance system; (2) the school's professional capacity; (3) strong parent-community school ties; (4) a student-centered learning climate; and (5) leadership that drives change. The researchers found that schools with strong essential supports were ten times more likely to improve student performance on standardized tests than schools with weak supports. We build on this literature by examining the role of social working conditions in supporting teachers' sense of success during a period of dramatic organizational change.

The Challenges of Teaching During Crisis

Organizational change in schools is not always well-developed and carefully planned in advance. When external crisis strikes, schools must shift their practices suddenly—often in ways that are impossible to anticipate. Teachers function as "first responders in tragedy" (O'Toole & Friesen, p. 1). Studies of teachers following disasters demonstrate that teachers frequently endure the stress of supporting students' socioemotional and academic needs while tending to their own personal trauma (Carlson et al., 2010; Kuriansky, 2013). Following Hurricane Katrina, Lowery and Burts (2007) found that teachers in New Orleans described teaching under "survival circumstances," coping with their own losses, and elevated rates of depression and fear (p. 72).

Crisis often disproportionately affects low-income communities and the schools that serve them (Evans, 2004; Simon & Evans, 2014). In ordinary times, Bryk (2010) described schools serving large proportions of children living under "extraordinary circumstances" (p. 29) as facing a "three-strike" problem: they are highly-stressed organizations, existing in challenged communities, and confronting tremendous human need every day. Supporting students and their families in coping with additional stressors can exacerbate an already overwhelming teaching role (Bryk, 2010; Kraft et al., 2015; Simon & Evans, 2014). As such, during crises, teachers frequently experience "role overload" (Kuntz et al., 2013) and a decreased sense of self-efficacy in their teaching (Seyle et al., 2013). We build on these findings by exploring whether and how working conditions helped to prevent teachers from the common effects of stress and crisis.

Teachers' Experiences with "Emergency Remote Teaching" During COVID-19

In March 2020, the COVID-19 virus sparked widespread, sustained disruption to schooling in the U.S., shuttering school buildings and forcing instruction online within a matter of days. Early reports on the transition to "emergency remote teaching" (Hodges et al., 2020) by

Gallup and others suggest that the overwhelming majority of schools pivoted quickly to some form of remote instruction (Brenan, 2020; Hamilton et al., 2020).

Student Engagement. Multiple research groups have explored educators' perceptions of student engagement during emergency remote instruction. Researchers at RAND found that nearly 90% of principals reported that students in their schools lacked internet access and 40% reported that, even for teachers, access to technology and/or internet was a barrier. Roughly a third of principals (35%) reported that district policies related to the use of online tools (such as Zoom or Google Suite) presented limitations (Hamilton et al., 2020). In addition, EdWeek (2020) found that 74% of teachers said their students' current level of engagement was "much lower" or "somewhat lower" than it had been prior to the pandemic, and nearly a quarter of students were "essentially 'truant.'"

Teacher Morale. Through its survey, EdWeek (2020) found that morale for teachers, students, and administrators plummeted during the early months of the pandemic. Analyzing interviews with 40 teachers across the country, Reich and colleagues (2020) found that teachers expressed concerns about three key themes: struggling to motivate students virtually; the loss of professional identity and burnout; and exacerbated inequities for students. Experienced teachers expressed feeling ineffective with students and frustrated that they could not draw on their pedagogical expertise in the virtual environment.

Technological Challenges: For most teachers, the shift entailed mastering an entirely new set of pedagogical practices for teaching online (Trust & Whalen, 2020). For the many teachers who lacked confidence using educational technology prior to the pandemic (Rebora, 2016), this shift was likely especially challenging. This is particularly true for teachers whose students had

little opportunity to master technology as a tool for learning before the pandemic, a phenomenon that is disproportionately common in schools serving low-income students (Rebora, 2016).

Work-Life Balance. Early reports suggest that the pandemic had a differential impact on women than on men, especially mothers (Calarco et al., 2020; Zamarro et al., 2020). In an analysis of roughly 9,000 respondents representing the entire United States, Zamarro and colleagues (2020) found that by June, 64% of college educated working mothers reported that they had reduced their working hours, compared with 52% of women without children and 36% of fathers. Women with children were also far more likely to report psychological distress. Drawing on surveys of 139 mothers of young children, Calarco and colleagues (2020) found that mothers coping with "intensive work pressures" (p. 1) while caring for their children reported increased anxiety, stress, and frustration with their children.

Exacerbated Inequalities. Several studies have highlighted the stark disparities in student engagement between schools serving low-income students and students of color and those serving wealthier, whiter communities (Hamilton et al., 2020; Patrick & Newsome, 2020). For example, Educators for Excellence (2020) found that just 51% of teachers in high-poverty schools reported that most of their students were able to participate daily in distance learning, in comparison with 84% of teachers in affluent schools. Bacher-Hicks, Goodman, and Mulhern (2021) found similar patterns in their study of high frequency internet search data; in more populous regions with greater wealth and superior internet, more households sought out online learning resources. This is not surprising given research prior to the pandemic documenting the stark disparities in access to high-speed internet and technological devices (Rebora, 2016).

Collectively, this body of research suggests that strong working conditions in schools may have served as a protective factor for teachers in the transition to remote learning during the

COVID-19 pandemic. Working conditions may mitigate the effects of sudden crisis and organizational upheaval on teachers' day-to-day work and, ultimately, their sense of success with students. We test this theory by using the context of the COVID-19 pandemic to examine whether and how working conditions matter during times of organizational change.

Methods

Data and Sample

Our primary data are derived from teachers' responses to the Upbeat *Teacher Engagement* survey and *Teaching from Home* addendum in the spring of 2020. Upbeat is a fee-for-service education technology firm that supports districts and schools with teacher retention by conducting and analyzing surveys about teachers' working conditions each fall and spring (see www.teachupbeat.com for additional information). Upbeat recruits clients nationwide through conferences for human resource professionals, professional organizations for superintendents and principals, and via word-of-mouth.

We construct two primary samples using data from the Upbeat surveys. Our larger descriptive sample is comprised of 7,841 teachers who responded to the spring 2020 administration of the *Teacher Engagement* survey and the *Teaching from Home* addendum administered jointly. These teachers worked in 206 schools across 10 districts and 5 charter school networks located in nine geographically-diverse states (GA, IL, LA, MI, NY, SC, TX, VA, VT). As shown in Table 1, respondents represent a diverse sample of teachers in traditional and charter public schools working across a wide range of student populations.

Respondents and the schools in which they work are largely representative of teachers and students in U.S. public schools with a few notable exceptions (see "National Average" column in Table 1). Roughly 80% of teachers are female and average about 13 years of

experience, closely approximating national averages (Taie & Goldring, 2020). Similarly, white, non-Hispanic teachers comprise three-quarters of the sample and 79% of the nation's public school teachers. Black teachers are oversampled relative to the national workforce, comprising 14% of the sample but just 7% of the nation's teachers. Conversely, only 3% of our sample is Hispanic compared to 9% of the nation's teachers. One key difference of the schools in our sample compared with national averages is the large over-representation of suburban schools (84% relative to 32% nationally). This is largely because one mid-sized suburban district in the south constitutes 61% of our sample and 102 of 206 total schools (see Appendix Table A1).

We complement these self-reported teacher characteristics with school sociodemographic characteristics and academic performance measures gathered from the Common Core of Data, state departments of education, and school websites. The schools in our descriptive sample serve student populations that are, on average, 45% white, 54% from low-income families, and 14% students with disabilities, closely approximating national averages. Similar to teacher demographics, the schools in our sample serve student populations that are more Black (30% relative to 15% nationally) and less Hispanic (18% relative to 27% nationally). This is largely a function of the lack of schools from states with larger Hispanic populations. Roughly half of teachers work in elementary schools, and 10% teach in mixed grades schools, with the rest split evenly between middle and high schools. Academic proficiency rates on state standardized exams in these schools closely approximate national averages, suggesting that participating schools are not negatively selected.

We also construct a longitudinal sample by combining these spring survey data with teacher responses to the *Teacher Engagement* survey administered to many of the same schools in the fall of 2019 before the pandemic. We link individual teacher responses across the fall and

spring survey administrations using school email accounts. A total of 5,957 teachers working in 179 schools across 11 districts are represented in this longitudinal sample. As shown in Table 1, teachers in the longitudinal sample are quite similar to those in the full descriptive sample.

We collected a range of data about the contexts and transition to remote learning for districts and charter management organizations in the sample (see Appendix Table A1). Districts transitioned to remote learning between March 13th, 2020 and April 13th, 2020. COVID-19 case counts were slightly lower in our samples, on average, than the nation as a whole, but infection rates were rising more rapidly relative to other parts of the country.[1] At the start of remote learning, students in many districts worked on instructional packets distributed on the last day of in-person instruction. As state governors extended school closures, districts began working on long-term instructional methods. Most districts depended on Google products or Zoom.

All of the districts we study took steps to support students' abilities to participate in remote learning such as distributing devices and printed work packets to students. Some districts also deployed WiFi-enabled buses to neighborhoods or provided WiFi in school parking lots. Expectations of both teachers' and students' work varied across and within districts. Some districts required synchronous instruction, while others did not. In our sample, charter school networks typically required more face-to-face, remote instruction than did public schools. Some districts required teachers to provide weekly student feedback or host weekly office hours. All districts altered their grading policies, often in response to state guidance. In some districts, grading stopped altogether after closure, and final grades reflected pre-COVID-19 achievements.

Instruments

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[1] The COVID-19 county case count in our sample was 6.56 for every 100,000 residents on April 20th, slightly lower than the national average of 7.73. However, the Rt scores in the sample, a measure of how fast the virus was spreading, was 1.81, meaningfully higher than the national average of 1.22.

Teacher Engagement survey: The Upbeat *Teacher Engagement* survey is comprised of 75 items that ask teachers about their experiences as public school teachers and perceptions of their work environments. We developed and refined the survey in partnership with Upbeat over several years. The *Teacher Engagement* survey capture a range of constructs identified in the research literature as relevant for teachers' satisfaction, sense of success, and retention (Merril, 2021). The vast majority of items ask teachers to use a four-choice Likert response scale to express their agreement or disagreement with a statement (Strongly Disagree, Disagree, Agree, Strongly Agree). We draw on data from the *Teacher Engagement* survey administered before the pandemic to Upbeat clients between September 3rd, 2019 and January 31st, 2020 and again in the spring between April 27th and June 23rd, 2020. The spring administration prompted teachers to answer the *Teacher Engagement* survey based on "experiences working at your school PRIOR to COVID-19 school closures." All items remained constant across survey administrations.

Upbeat worked closely with partner districts to ensure high response rates to the survey. District administrators and principals discussed the survey with teachers well in advance and emphasized its importance. Upbeat then administered the survey directly to teachers' school email accounts, which allowed them to track individual responses and send multiple follow-up emails. Communication around the survey highlighted the opportunity for teachers to have their voices heard and the independent nature of the survey collection process which ensured teachers' anonymity. Ultimately, Upbeat was able to secure a response rate of 77% for the fall survey and 81% for the spring survey and addendum.

Teaching from Home addendum: The *Teaching from Home* addendum consists of a parsimonious set of 14 items we added to the end of the spring 2020 *Teacher Engagement* survey to capture teachers' specific experiences during emergency remote teaching. We developed these

items by gathering practitioner feedback from Upbeat client districts, conducting cognitive

testing and interviews, and then pilot testing the items (Dillman, Smyth, & Christian, 2009).

Teachers first completed the retrospective *Teacher Engagement* items. After completing these

items, we prompted teachers to respond to a set of questions about their "experience teaching

remotely while schools are closed due to COVID-19." We included the clause "during this

distance learning period" at the end of each item on the *Teaching from Home* addendum to

ensure teachers responded based on their recent experiences during the pandemic. We provide

further details about the survey instruments and instructions in Appendix A.

Measures

Here, we highlight items on the *Teacher Engagement* survey and *Teaching from Home*

addendum that are central to our analyses. First, to understand challenges during remote learning,

we included a series of unique questions on the spring 2020 *Teaching from Home* addendum

about student access to technology and teachers' success in balancing responsibilities at work

and at home, caretaking responsibilities, and comfort with technological tools for remote

teaching. We also asked teachers to report on the percent of students regularly engaged during

remote learning. The answer choices for this question were in quintiles and then coded to

indicate the median value of each quintile (e.g., if a teacher reported that 41-60% of their

students were engaged, this was coded as 50.5%).

Across the two survey administrations, we capture teachers' perceptions about their sense

of success and working conditions for three distinct periods during the 2019-20 school year. The

fall *Teacher Engagement* survey captured teachers' early experiences teaching in person. The

spring *Teacher Engagement* survey with the *Teaching from Home* addendum then captured

teachers' retrospective perceptions about schools in the early spring while they taught in person

as well as what they were experiencing while teaching remotely in the late spring. Items on the two administrations of the *Teacher Engagement* surveys were identical, while items on the *Teaching from Home* addendum differed to a small degree in wording (See Appendix Table A4 for the full set of items). We measure teachers' sense of success with a single item asking them about the degree to which they agreed that they felt successful teaching students.[2] We show in Appendix Table A2 that the majority of variation in teachers' sense of success (77%) exists within teachers across time suggesting teachers' experiences changed in meaningful ways over the 2019-20 school year. Consistent with prior research, we also find that teachers' self-reported sense of success is a strong predictor of whether teachers returned to their schools in the fall of 2020. Prior to the pandemic, teachers who reported that they strongly disagree that they feel successful were more than twice as likely to leave their school as those who strongly agreed they felt successful (see Appendix Table A3).

We also construct measures of teachers' working conditions at three points in time: the fall, the early spring in person (retrospectively), and the spring during remote learning. Surveys captured teachers' perceptions about five broad dimensions of their working conditions: collaboration, communication, professional development, professional expectations, and recognition. We construct these composite measures by conducting a principal component analysis (PCA) separately for teachers' responses in each period. We use ten items to construct the fall measure and the spring retrospective measure of working conditions and seven items for the spring measure during remote learning.

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[2] To address concerns that differences in item wording might bias our results, Upbeat administered both versions of the sense of success item to a sample of over 11,000 teachers in the fall of 2020. We found an exact agreement rate of 85%, with 89% of teachers reporting they felt successful on the *Teacher Engagement* version of the item and 92% of teachers reporting they felt successful on the *Teaching from Home* addendum version of the item. If anything, this suggests our results are a conservative estimate of teachers' decline in their sense of success.

Although each of the dimensions of working conditions are conceptually distinct, we chose to reduce the dimensionality of the data into an overall measure of working conditions for each of the three periods we captured in our survey data. Similar to prior analyses of teacher working conditions surveys (e.g., Kraft, Marinell, & Yee, 2016; Kraft & Papay, 2014), each of the first principal components from the three analyses weighted items roughly equally, explained half of the total variance,[3] was the only component above the "breaking point," and was the only component with an eigenvalue greater than one. The items that contribute to each working conditions composite have an alpha reliability of between 0.86 and 0.89 in each survey period.

We construct two complementary measures of working conditions for each of the three time periods: (1) teachers' individual perceptions about their working conditions, and (2) the average perceptions of their peers in the same school. For our individual working conditions measure, we use the first principal component from our teacher-level PCA. Such an approach has been infeasible in most prior research because working conditions surveys are often anonymous, requiring aggregation at the school level. As shown in Appendix Table A2, a variance decomposition where these individual working condition measures across the three time points are nested within teachers and teachers are nested within schools reveals that only 15% of the total variation reflects stable differences across schools. Almost half (47%) of the variation is across teachers at the same school, demonstrating that teachers in the same school experience their working conditions in very different ways. This finding is consistent with evidence from qualitative studies that describe substantial nuance and complexity in how individual teachers experience their working conditions (Forman et al., 2017; Griffin, 2018; Griffin & Tackie, 2016; Johnson, 2019; Kardos et al., 2001). The remaining variation (38%) is a combination of

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[3] The first principal component explained 51% in the variance among these survey items in the fall, 53% in the spring before remote learning, and 55% in the spring after remote learning.

measurement error and systematic variation within individual teachers over time, suggesting that working conditions can vary meaningfully over the course of a single school year.

While teacher-specific measures of their working conditions are attractive from a conceptual standpoint, they introduce potential bias when examining self-reported outcomes such as teachers' sense of success. Teachers' own perceptions of their working conditions may be endogenously related to their sense of success due to, for example, teachers' overall satisfaction with their job. To guard against this threat, we also generated a "jackknife" working conditions measure that averages teacher-level scores of all teachers in a school but leaves out individual teachers' own perceptions. This peer-average measure serves to characterize the overall perception of working conditions and breaks the link between individual teachers' own perceptions of their working conditions and their self-reported sense of success. At the same time, this average measure fails to allow for any real differences in teachers' experiences within the same school. We view our individual working conditions and peer-average working condition measures as providing approximate upper and lower bounds of the relationships we explore. We standardized our individual and peer-average working condition measures to have a mean of zero and variance of one in each survey period. Similar to prior studies, we confirm the predictive validity of our measures of working conditions with teachers' decision to return to their districts the following year in Appendix Table A3.

Analytic Approach

To address our first two descriptive research questions, we report teachers' responses to the spring *Teaching from Home* addendum overall and across a range of sociodemographic characteristics of teachers and schools. For ease of interpretation, we use a binary coding scheme to describe if a teacher agreed versus disagreed with an item.

To explore how the COVID-19 pandemic and transition to remote learning affected teachers' sense of success, we adopt a longitudinal analytic model (Singer & Willett, 2003) that combines both pre-post and retrospective survey design features. From a causal inference perspective, our longitudinal model can be thought of as an interrupted time series (Shadish, Cook, & Campbell, 2002). The core assumptions of this approach are that teachers' sense of success would have remained relatively stable in the absence of the pandemic and that no other concurrent events affected teachers' sense of success. We examine both assumptions directly in our robustness section. Throughout these analyses, we conceptualize "treatment" as the joint effects of the sudden transition to remote teaching and working coupled with the broader health, economic, and social effects of the COVID-19 pandemic during which this transition took place. Thus, our findings identify the effect of remote teaching combined with the broader challenges teachers faced in their professional and personal lives due to the pandemic.

Our longitudinal model captures how individual teachers' sense of success changed across three time periods: fall 2019, spring 2020 before remote teaching, and spring 2020 during remote teaching. This combined pre-post (fall 2019 vs. spring 2020 during remote teaching) and retrospective (spring 2020 before vs. during remote teaching) study design provides two main benefits to the longitudinal analyses. First, the retrospective survey design captures teachers' perceptions during the time period just before remote learning, while avoiding potential response-shift bias in which an individual's frame of reference changes across survey administrations (Aucejo et al., 2020; Pratt, MacGuigan, & Katzev, 2000; Weixler, Harris, & Barrett, 2018). At the same time, retrospective survey designs may lead to a reverse halo effect in which teachers recall the conditions before the pandemic as worse than they were because of the stress and anxiety that they were facing when they took the spring survey (Cooper, 1981;

Weixler, Harris, & Barrett, 2018). The pre-post design guards against this potential bias, as well

as other types of recall bias associated with the challenges of remembering one's experiences

retrospectively. The fall 2019 survey captured teachers' experiences in real time before the

pandemic had occurred. Thus, having both fall 2019 and spring retrospective responses allows us

to address the weaknesses of both pre-post and retrospective designs.

We specify a multilevel ordered logistic model within a longitudinal analytic framework

to examine how teachers' odds of rating their sense of success higher (e.g., from Disagree to

Agree) changed over the three time periods in a teacher-period panel dataset. We model the full

range of changes in teachers' responses on the ordinal Likert scale because many of the changes

we observe are between the two positive responses (Agree vs. Strongly Agree) given teachers'

generally high ratings of their sense of success. For ease of interpretation, we present the

structural elements as a latent-variable model:

$$Y_{jt}^* = \alpha_1(t = Remote) + \alpha_2(t = SpringPre) + \sigma X_j + \varphi Z_s + (\mu_j + \varepsilon_{jt}). \quad (1)$$

Here, Y_{jt}^* is an unobserved latent measure of teacher j's sense of success at time t. The ordered

logistic model takes the observed ordinal measure Y_{it} and estimates both the coefficients of the

structural model as well as the cutpoints κ_1 through κ_{m-1} such that

$$Y_{it} = m \quad \text{if } \kappa_{m-1} \le Y_{jt}^* < \kappa_m \quad \text{for } m = 1 \ to \ D, \quad (2)$$

where m is a given Likert scale response option and D=4. The estimate of α_1 is our primary

parameter of interest, representing the log odds than a teacher rated their sense of success as

higher during the pandemic relative to the fall, and X_j and Z_s are vectors of teacher- and school-

level control variables, respectively. μ_j captures teacher random effects and ε_{jst} represents the

idiosyncratic error term. Teacher-level controls include a series of indicator variables for teacher

race, gender, and level of experience for early (less than five years), mid (between five and 15

years), and late (over 15 years) career teachers.[4] School-level control variables include student

proficiency levels in reading and math from the 2017-18 school year, student enrollment, grade

level, school type (charter vs. traditional), student racial/ethnic demographics, the percent of

English language learners, and the percent of students eligible for free or reduced-price lunch.

We next explore the role that teachers' working conditions during the pandemic played in

moderating changes in their sense of success. To do this, we interact individual (or peer-average)

working conditions with our indicator for the remote teaching period, *Remote*. Our latent-

variable model takes the form:

$$Y_{jt}^* = \alpha_1(t = Remote) + \beta\big([t = Remote] * WC_{j,t=Remote}\big) + \alpha_2(t = SpringPre) + \sigma X_j +$$

$$\varphi Z_s + (\mu_j + \varepsilon_{jt}). \quad (3)$$

Here, our parameter of interest, β, now represents the degree to which changes in individual

teachers' sense of success during the pandemic were related to the quality of their remote

working conditions (*WC*).

We complement our longitudinal modeling approach with a taxonomy of ordered logistic

regression models within a lagged dependent variable framework. These lagged dependent

variable models allow us to estimate whether changes in teachers' sense of success during the

pandemic are related to their remote working conditions, while controlling flexibly for teachers'

self-reported sense of success in two prior periods and a range of teacher and school

characteristics. This approach is analogous to value-added specifications that condition on prior

test scores when modeling contributions to student achievement. In our analysis, the structural

component of the latent-variable model takes the form:

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[4] We address missingness for our teacher experience measure by creating and including an additional indicator for
when teachers failed to report their own experience level.

$$Y^*_{j,t=Remote} = \sum_{m=1}^{4} \theta_m * 1(Y_{j,t=SpringPre} = m) + \sum_{m=1}^{4} \vartheta_m * 1(Y_{j,t=Fall} = m) +$$

$$\beta(WC_{j,t=Remote}) + \sigma X_j + \varphi Z_s + \varepsilon_j. \quad (4)$$

Here, we include indicators for teachers' sense of success from the spring retrospective survey pre-COVID-19 (*SpringPre*) and the fall survey (*Fall*) as non-parametric controls for teachers' sense of success prior to the pandemic. Additional teacher- and school-level controls are the same as described above. Across all our models, we present results in terms of odds ratios and cluster our standard errors at the school level to account for the non-independence of teachers' error terms within schools.

Findings

What challenges did the pandemic and sudden change to remote teaching present for teachers?

Teachers faced a range of challenges in pivoting to remote teaching during the COVID-19 pandemic. As shown in Table 2, teachers perceived that, on average, only 59% of their students were able to be regularly engaged in remote learning. One factor that likely contributed to this low level of engagement was limited access to reliable, high-speed internet and internet-enabled devices. Overall, 26% of teachers reported that their students lacked the technological tools they needed for remote learning.

Teachers also reported concerns about their ability to manage their professional responsibilities and use online teaching tools. 40% agreed that caretaking responsibilities for children and/or dependent adults had made it difficult to do their job, and 16% of teachers reported that they were unable to balance their work with other responsibilities at home. Further, 9% of teachers were uncomfortable using the technological tools necessary to teach remotely.

How did these challenges differ across teacher and school characteristics?

Teacher Characteristics. Disaggregating overall patterns in teachers' experiences reveals important differences in the challenges created by the pandemic and sudden pivot to remote learning. Mid-career teachers particularly struggled to balance their work with the demands of their personal lives during the pandemic. In Panel A of Table 2 and Figures 1 and 2, we show how challenges related to caretaking and balancing work and home responsibilities differed by experience and gender. Half of mid-career teachers reported that caretaking responsibilities made their job difficult, while 38% of early-career teachers and just 30% of late-career teachers reported these same concerns. These patterns likely reflect the greater likelihood that mid-career teachers have school-age children at home with them. Women across all ranges of experience were substantially more likely to report that they struggled to balance work and home responsibilities compared to men. Late-career teachers also reported being less comfortable teaching online. As shown in Figure 3, 13% of teachers with 20-29 years of experience and 22% of teachers with 30 years of experience or more were not comfortable using online teaching tools, compared to only 6% of teachers with less than 10 years of experience and 7% of teachers with 10-19 years of experience.

School Characteristics. Low overall levels of perceived student engagement mask considerable variation across the schools in our sample. In Figure 4, we illustrate how average levels of perceived student engagement varied across schools. Roughly one in ten schools had less than 40% of students that were able to be regularly engaged in remote learning, while approximately one in six schools had over 70% of students regularly engaged in remote learning.

In Panel B of Table 2, we also show the stark differences in perceived student engagement along racial and socioeconomic lines. As illustrated in Figure 5, teachers in high-poverty schools reported that only 51% of students were able to be regularly engaged in remote

learning, whereas their counterparts at low-poverty schools engaged at a much higher rate: 79%.[5]

Figure 6 shows that in schools where a majority of students are Black, teachers reported that 47% of students were able to be regularly engaged in remote learning; at schools that had enrollments of fewer than 10% Black students, teachers reported that 74% of students regularly engaged in remote learning.[6] However, we find a much smaller difference in reported student engagement across schools based on the proportion of Hispanic students.

As shown in Panel C of Table 2, we find large differences in perceived engagement and comfort with technology based on school characteristics. Teachers in schools with low achievement during the 2018-19 school year reported that slightly less than half of their students were able to be engaged compared to 58% and 67% of students in middle- and high-achieving schools respectively. Teachers in schools with low prior achievement as well as elementary and traditional schools also reported that students' access to technology was a greater barrier. Further, charter school teachers were less likely than teachers in traditional public schools to express their own discomfort with technological tools for remote learning.

How did the pandemic and transition to remote teaching affect teachers' sense of success?

We find that the pandemic and the pivot to remote teaching resulted in a sudden and steep drop in teachers' sense of success. 53% of all teachers who completed the spring survey reported that their sense of success declined during remote teaching relative to just before the pandemic (see Appendix Figure A1). Of those reporting declines, roughly one in four reported a decline of more than one response level (e.g., moving from Strongly Agree to Disagree).

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[5] Consistent with federal guidelines, we define low-poverty as schools where less than 25% of students are eligible for free or reduced-price lunch (FRPL) and high-poverty as schools where over 75% of students are eligible for FRPL.

[6] These results are quite similar even when we limit our sample to only include Black teachers.

We formally model the longitudinal changes to teachers' sense of success using an ordered logistic regression model and report the results in Table 3. We find the odds that teachers' sense of success *increased* (e.g., Agree to Strongly Agree) dropped by 85% during the pandemic relative to the fall. Said in a more intuitive way, we find an almost 7-fold rise (or a 678% increase) in the odds that teachers' sense of success *decreased* in the spring remote teaching period relative to the fall.[7] We can also characterize this decline as a change in the continuous, latent measure of teachers' sense of success. Our estimate suggests that teachers' sense of success dropped by approximately 0.9 standard deviations relative to the fall.[8]

What role did working conditions play in sustaining teachers' sense of success during the transition to remote teaching?

We find that teachers' working conditions during the pandemic played an important role in sustaining their sense of success. We begin by providing graphical intuition for the role of remote working conditions in mitigating the decline in teachers' sense of success. In Figure 7, we show how the percent of teachers who agreed or strongly agreed that they feel successful changed differentially based on the quintile of individual working conditions teachers reported during the pandemic. Although teachers whose schools struggled to provide strong remote working conditions reported lower levels of success prior to the pandemic, they also experienced meaningfully larger declines in their sense of success on average.

Longitudinal Model Estimates. We formally model changes across the full spectrum of teachers' sense of success using a longitudinal model. As shown in Table 3 columns 3 and 4, we find that teachers with one standard deviation higher individual working conditions during the

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[7] This estimate is derived by taking the inverse of odd ratios (see Long & Freese, 2014; p. 338).
[8] This translation involves using sample estimates to approximate σ_{y*}, the standard deviation of the latent continuous measure of teachers' sense of success, and standardizing the untransformed log-odds estimate of β (Long & Freese, 2014; p.333).

pandemic had more than twice the odds of their sense of success *increasing* during remote

teaching compared to a teacher with remote working conditions one standard deviation lower.

Alternatively, we can say that teachers working in schools with better remote working conditions

were substantially less likely to experience a decline in their sense of success. We estimate that

teachers at the 25th percentile of individual working conditions experienced a 10-fold increase in

the odds that their sense of success *decreased* during remote learning, while teachers at the 75th

percentile of individual working conditions experienced only a 4-fold increase. Our estimates are

nearly identical with and without controls for teacher and school characteristics. When we

substitute individual working condition measures with peer-averages (columns 5 and 6), we find

that this positive, statistically significant relationship persists but is attenuated: teachers in a

school with one standard deviation higher peer-average working conditions have 17% greater

odds that their sense of success *increased* compared to teachers with peer-average working

conditions one standard deviation lower.

 Lagged Dependent Variable Estimates. Results from our lagged dependent variable

specification reported in Table 4 are quite similar to our findings from longitudinal models. We

again find that the odds that teachers' sense of success *increased* are more than double for a one

standard deviation higher level of individual working conditions during the pandemic (Panel A).

We also find that the odds of teachers' sense of success *increasing* were roughly 30% greater for

a one standard deviation higher level of peer-average remote working conditions (Panel B). This

is equivalent to a 0.4 standard deviation increase in teachers' sense of success for every standard

deviation increase in individual working conditions and a 0.13 standard deviation increase in

peer-average working conditions during the pandemic. Our estimates are quite robust to the

inclusion of a range of controls, including indicators for prior levels of reported success in both

the fall and spring before remote learning, teacher and school characteristics, and prior ratings of teachers' working conditions.

We provide further intuition about the relationships between teachers' individual working conditions and their sense of success during the pandemic in Figure 8. Here we plot the predicted probabilities of positive or negative responses to the sense of success item, conditional on the full set of indicators for prior sense of success and other controls (Table 4 column 4). These conditional probabilities illustrate the strong association between individual working conditions and teachers' sense of success during the pandemic even after controlling for their prior levels of self-reported success and other covariates. We see the probability of feeling successful (Agree or Strongly Agree) during remote learning increased from 25% at the low end of the remote working conditions distribution to 90% at the top end of the distribution.

Extensions

Our primary analyses focus on the relationship between teachers' remote working conditions and changes in teachers' sense of success. We extend these analyses by exploring how working conditions measured in the fall and spring *prior* to the pandemic relate to changes in teachers' sense of success. We find some evidence that working conditions prior to the pandemic were related to changes in teachers' sense of success, but to a much lesser degree than remote working conditions. Results from our longitudinal model presented in Appendix Table A5 show largely positive estimates (odds ratios greater than 1) for the interactions with fall and spring in-person working conditions. Results from lagged dependent variable models in Appendix Table A6 are uniformly positive and at least marginally significant for these earlier measures of working conditions as predictors of changes in teachers' sense of success. This pattern makes sense given that schools with stronger working conditions in the fall were more

likely, but not guaranteed, to have stronger working conditions in the spring during the pandemic (individual r=0.48; peer-average r=0.68; see Appendix Table A7). We do not find evidence that these patterns vary systematically across grade levels (see Appendix Table A8).

Robustness Tests

We examine the robustness of the descriptive patterns and effects on teachers' sense of success in several ways. First, our findings, particularly the differential levels of student engagement across schools and the sudden drop in teachers' sense of success, could reflect the influence of George Floyd's murder and the subsequent uprising in response to racial injustice and police violence. However, 91% of teachers completed the spring *Teacher Engagement* survey and *Teaching from Home* addendum before May 25th when Floyd was killed. All of our findings remain consistent when we restrict our sample to include only responses before May 25th.

Second, attributing the large drop in teachers' sense of success to the pandemic and transition to remote teaching assumes that their sense of success would have remained unchanged in the absence of this treatment. It is difficult to know for sure how teachers' sense of success might have evolved in this counterfactual scenario. One approach would be to project the small upward trend in teachers' sense of success between the fall and spring prior to the pandemic. If this trend were sustained, our estimates would understate the full effect of the pandemic and remote teaching on teachers' sense of success. Alternatively, we might assume teachers' sense of success would fall as the end of the school year neared and they experienced burnout (Parker et al., 2012). We specify our longitudinal model such that our estimate of the decline in teachers' sense of success is relative to the fall, implicitly assuming a counterfactual decline in their sense of success back to their baseline levels (possibly because of burnout).

Ultimately, end-of-year burnout for teachers would need to be implausibly large, multiple orders of magnitude larger than the gains teachers made from fall to spring, to even come close to calling into question the conclusion that the pandemic had a large negative causal effect on teachers' sense of success.

Finally, it is possible the one mid-size district that constitutes 61% of our sample is driving the overall patterns we find. However, when we remove this district from the sample, our results remain broadly similar. If anything, reported challenges appear even more daunting with this district removed from our sample (See Appendix Table A9).

Discussion

In this paper, we examine the experiences of teachers during the early months of the COVID-19 pandemic—a period of unprecedented and remarkably rapid organizational change. Our findings reveal that teachers across the U.S. faced immense challenges during this time. The pivot to emergency remote teaching resulted in a sudden, massive drop in teachers' sense of success. Teachers struggled to find a balance between their professional and personal responsibilities. They scrambled to master new technology. And, often despite dedicated efforts by districts and schools to distribute technology and provide internet access, teachers reported that large proportions of their students remained disengaged in remote learning—due, in part, to their continued lack of access to technology.

Consistent with prior research, our findings highlight the critical importance of school organizational practices to teachers' work. School working conditions during the pandemic mattered greatly for sustaining teachers' sense of success. We find that teachers who could depend on supportive working conditions such as strong communication, fair expectations, and

recognition of effort from the top, along with targeted professional development and meaningful collaboration with colleagues, were least likely to experience a dip in their sense of success.

Teachers working in low-income communities and communities of color that have been disproportionately affected by the virus have faced the most profound challenges (Oppel Jr. et al., 2020). Early evidence suggests that the pandemic has already exacerbated existing educational inequality (Bacher-Hicks et al., 2021; Chetty et al., 2020; Kuhfeld et al., 2020). We provide further evidence that learning was deeply obstructed for Black students and for those with limited family income. In addition, our data shed light on the more subtle ways in which students of color and students from low-income backgrounds are shortchanged: by attending schools with weak organizational cultures that are unable to support teachers to adapt their practice during challenging times of sudden change.

Implications for Policy & Practice

The shift to emergency remote teaching was sudden and daunting, but catastrophe *can* be a catalyst for positive change. Building and sustaining strong work environments for teachers—whether remote or in-person—should be central to the approach in every locale. However, strong working conditions will not develop in response to state or district mandates. To ensure that policies translate into teaching and learning, policymakers must focus on capacity-building in schools, in districts, and in state education offices intended to support this work in schools' (McDonnell & Elmore, 1987).

This study points to potential capacity-building efforts where school systems might focus their attention. To start, principals can narrow their efforts by defining their school's "malleable processes" (Viano et al., 2020, p.1)—those within their locus of control. Encouragingly, our results suggest that what schools do during the pandemic to support teachers matters. Schools

might begin by developing systems for strong communication and for recognizing teachers'

efforts so that teachers do not feel isolated from one another. In addition, they might work with

teachers to solicit and set expectations for work, determine training that teachers need, and

design structures for formal and informal collaboration. By investing in these aspects of working

conditions, schools are more likely to be prepared to navigate organizational change now and in

the long-term.

As part of this work, school leaders also need support to address those problems that

influence the work of teachers and students but fall outside of the school's locus of control. For

example, as our results indicate, teachers in schools with mostly Black students or students living

in poverty reported that their students were much less likely to be able to engage in remote

learning. Although access to technology and internet likely contribute to this finding,

policymakers, practitioners, and researchers must not overlook the intersectionality of economic

disadvantage, anti-Black racism, and other powerful out-of-school factors that constrain

teachers' work and students' opportunities to learn (Brody et al., 2006; Duncan & Brooks-Gunn,

1997; Mays et al., 2007; Seaton & Yip, 2009).

Limitations

Our analyses and their subsequent implications are limited by several factors. First, while

we find a large and robust pattern of working conditions moderating changes in teachers' sense

of success, these moderation analyses do not identify a causal effect. Other unmeasured factors

correlated with both working conditions and changes in teachers' sense of success could be

driving our results. Second, the composite nature of our working condition measures prevents us

from identifying with confidence which specific working conditions elements are driving the

relationships we find. Third, the unique context of our analyses—a once-in-a-century global

pandemic—may shape our findings in a way that limit their generalizability to more typical times. Fourth, we still know little about why teachers in the same school experience their working conditions differently, as well as the implications of this variation for policy and practice. It will be important for future work to examine this question as well as how working conditions relate to less subjective outcomes, such as turnover and achievement, during major organizational change.

Conclusion

Teachers overwhelmingly enter the profession because they want to make a difference in the lives of students—especially for those who have been long underserved (Kraft et al., 2015). Yet, too often teachers find themselves in contexts where they feel isolated and ineffective. When this happens—and teachers cannot achieve a sense of success—they leave (Johnson & Birkland, 2003). We build on this work by documenting the enormous challenges that teachers faced during the onset of the COVID-19 pandemic, a time of unprecedented and rapid organizational change. We find that teachers experienced a precipitous drop in their sense of success during this sudden pivot to emergency remote teaching—and as their most vulnerable students struggled to engage in remote learning. Yet, supportive working conditions during remote teaching played a protective role: in schools where teachers experienced stronger working conditions, they also reported much lower declines in their sense of success than their peers in schools with weaker working conditions.

The pandemic has sparked an enormous transformation of our school systems and instructional practices. To weather this ongoing storm, schools need to provide the supports that educators require to succeed in this new, evolving context. Teachers do not work in a vacuum.

Efforts to enact both temporary and lasting change in schools must attend to the organizational

conditions that make teachers' work and students' learning possible.

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Tables

Table 1. Sample Characteristics

	Descriptive Sample	Longitudinal Sample	National Average
	Panel A: Teachers		
Experience	13.1	13.6	13.8
Female	0.81	0.83	0.77
Asian	0.01	0.01	0.02
Black	0.14	0.12	0.07
Hispanic/Latinx	0.03	0.02	0.09
White	0.75	0.79	0.79
Multi-racial	0.01	0.01	0.02
n	7,841	5,957	
	Panel B: Schools		
Asian Students	0.01	0.00	0.05
Black Students	0.30	0.30	0.15
Hispanic/Latinx Students	0.18	0.15	0.27
White Students	0.45	0.48	0.48
Multiracial Students	0.02	0.02	0.04
Low-Income Students	0.54	0.52	0.53
Students with Disabilities	0.14	0.15	0.14
Elementary Schools	0.47	0.48	0.55
Middle Schools	0.20	0.22	0.16
High Schools	0.22	0.21	0.22
Mixed Grades School	0.11	0.09	0.06
Percent Proficient in Math	0.54	0.55	0.50
Percent Proficient in Reading	0.51	0.53	0.46
n	206	179	
	Panel C: Districts		
Student Enrollment	50,942	53,844	3,004
State Rt Rate on Date of School Closure	1.81	1.82	1.22
New Cases per 100,000 Residents	6.56	6.52	7.73
Urban	0.07	0.04	0.25
Suburban	0.84	0.85	0.32
Town or Rural	0.10	0.11	0.43
Traditional (non-Charter) School District	0.94	0.97	0.93
n	15	11	

Notes: School and district sample averages are weighted by the number of teachers in the sample. Sample teacher characteristics are based on teacher reports on the spring *Teacher Engagement* survey. National averages are for public school teachers during the 2017-2018 school year from Taie & Goldring (2020). School characteristics are from the Common Core of Data, State Departments of Education, and individual school websites. Percent proficient numbers are from NCES EdFacts for 2018-19. Other national averages are for public schools in the 2017-18 school year. Low-Income Students refers to students receiving free or reduced-price lunch. District characteristics are based on the Common Core of Data (2017-18) triangulated with district websites and rt.live. Rt captures the rate of COVID-19 spread based on the average number of people an infected person goes on to infect. See Appendix Table A1 for further information on school districts.

Table 2. Teachers' Perceptions of Remote Teaching During the Pandemic by Teacher and School Characteristics

	Average	Male	Female	Early Career	Mid-Career	Late Career	Asian	Black	Hispanic	White
					Panel A. Teacher Demographics					
Working Conditions	0.00	-0.06	0.02	-0.05	0.04	0.18	0.21	-0.03	-0.21	0.05
Percent of Students Engaged	59.4	57.5	60.0	59.3	62.4	64.6	55.5	51.3	61.3	61.4
Challenges										
Lack of Student Access to Technology (% Agree)	26.4	21.7	26.9	27.0	22.4	20.9	24.0	26.6	28.4	25.2
Balancing Work & Home Responsibilities (% Agree)	15.6	11.7	16.4	15.1	19.1	12.5	12.0	15.2	22.6	15.2
Caretaking Responsibility (% Agree)	40.0	42.5	39.5	38.4	50.3	30.1	34.7	34.1	46.7	40.9
Discomfort with Technological Tools (% Agree)	8.8	7.4	9.2	6.9	6.0	13.0	5.3	8.8	10.3	8.5
n	7,841	1,380	6,358	1,162	2,318	1,951	75	1,073	261	5,898

	Average	<10% Black	Majority Black	<10% Hispanic	Majority Hispanic	Low Poverty	High Poverty
				Panel B. Student Demographics			
Working Conditions	0.00	-0.01	-0.05	0.02	-0.14	0.15	-0.11
Percent of Students Engaged	59.4	71.1	47.1	61.5	60.0	74.5	51.2
Challenges							
Lack of Student Access to Technology (% Agree)	26.4	19.4	34.4	23.4	33.3	12.2	36.7
Balancing Work & Home Responsibilities (% Agree)	15.6	19.6	14.1	16.0	14.4	16.5	14.1
Caretaking Responsibility (% Agree)	40.0	41.3	37.5	40.9	40.1	43.3	36.8
Discomfort with Technological Tools (% Agree)	8.8	10.5	7.0	8.7	7.7	8.2	8.6
n	7,841	1,088	1,326	4,100	699	971	1,645

	Average	Elementary	Middle	High	Traditional	Charter	Low Prior Achievement	Middle Prior Achievement	High Prior Achievement
					Panel C. School Characteristics				
Working Conditions	0.00	0.11	0.04	-0.23	0.01	-0.08	-0.08	0.04	0.02
Percent of Students Engaged	59.4	60.4	56.0	59.4	59.5	57.7	48.0	58.2	67.0
Challenges									
Lack of Student Access to Technology (% Agree)	26.4	29.8	20.5	24.5	26.5	24.4	34.8	28.0	20.1
Balancing Work & Home Responsibilities (% Agree)	15.6	14.7	16.6	15.7	15.6	16.6	15.1	15.4	16.1
Caretaking Responsibility (% Agree)	40.0	40.3	39.6	41.3	40.0	39.3	38.2	39.6	41.3
Discomfort with Technological Tools (% Agree)	8.8	9.8	6.3	7.8	9.0	5.5	7.6	8.8	9.5
n	7,841	3,659	1,563	1,742	7,365	476	1,944	2,571	3,326

Notes: We display the overall and subgroup averages for student engagement and other reported challenges. The Percent of Students Engaged is the average of teacher reports of the percent of students regularly engaged during remote learning. Answer choices for this question were in quintiles and then coded to indicate the median of each quintile. Other reported challenges are based on dichotomous variables indicating if teachers reported each construct as a challenge. Teacher experience was divided into early career (less than five years), mid-career (between 5 and 15 years), and late-career (over 15 years). Consistent with federal guidelines, we define low-poverty as schools where less than 25% of students are eligible for free or reduced-price lunch (FRPL) and high-poverty as schools where over 75% of students are eligible for FRPL. Achievement is based on 2018-19 percent proficiency from EdFActs; ranges for low (under 37.5% proficient), middle (37.5-56% proficient), and high (above 56% proficient) are derived from terciles of achievement for all US districts.

Table 3. Longitudinal Analysis of Teachers' Sense of Success Moderated by Remote Working Conditions

	(1)	(2)	(3)	(4)	(5)	(6)
Remote Learning	0.148***	0.147***	0.150***	0.149***	0.146***	0.146***
	[-30.33]	[-30.43]	[-29.01]	[-29.09]	[-30.49]	[-30.75]
Spring, in Person	1.717***	1.716***	1.686***	1.685***	1.714***	1.715***
	[13.25]	[13.24]	[13.19]	[13.16]	[13.25]	[13.23]
Remote Learning* Individual Working Conditions			2.069***	2.051***		
			[15.23]	[14.79]		
Remote Learning* Peer-Average Working Conditions					1.169***	1.101+
					[3.07]	[1.81]
n(Observations)	17,871	17,871	17,871	17,871	17,871	17,871
n(Teachers)	5,957	5,957	5,957	5,957	5,957	5,957
Teacher and School Controls		Yes		Yes		Yes

Notes: + $p<.10$, *** $p<0.001$. Each column displays results from a separate ordered logistic regression of sense of success regressed on remote learning and, in panels 3-6, working conditions. Estimates are reported as proportional odds ratios. Robust standard errors are clustered at the school level and t-statistics are reported in brackets. Teachers' sense of success is measured by ordinal questions on the *Teacher Engagement* surveys and *Teaching from Home* addendum. Working conditions are measured by a PCA on a series of questions regarding professional development, communication, recognition, collaboration, and professional expectations from the *Teaching From Home* addendum. Control variables include teacher race, gender, and level of experience, as well as school prior year achievement, enrollment, grade level, charter/traditional, student racial/ethnic demographics, the percent of English Language Learners, and the percent of students eligible for free or reduced priced lunch.

Table 4. Lagged Dependent Variable Models of the Relationship Between Remote Working Conditions and Changes in Teachers' Sense of Success

|	(1)	(2)	(3)	(4)
	Panel A: Individual Working Conditions			
Remote Working Conditions	2.727***	2.285***	2.245***	2.392***
	[22.94]	[18.26]	[18.42]	[17.58]
	Panel B: Peer-Average Working Conditions			
Remote Working Conditions	1.312***	1.181***	1.122***	1.292***
	[6.15]	[4.12]	[2.91]	[4.18]
n	5,957	5,957	5,957	5,957
Lagged Success Indicators		Yes	Yes	Yes
Teacher and School Controls			Yes	Yes
Lagged Working Conditions Indicators				Yes

Notes: *** $p<0.001$. Each cell displays results from a separate ordered logistic regression of sense of success regressed on remote working conditions. Estimates are reported as proportional odds ratios. Robust standard errors are clustered at the school level and t-statistics are reported in brackets. Teacher sense of success is measured by ordinal questions on the *Teacher Engagement* surveys and *Teaching from Home* addendum. Working conditions are measured by a PCA on a series of questions regarding professional development, communication, recognition, collaboration, and professional expectations from the *Teacher Engagement* surveys and *Teaching from Home* addendum. See Table 3 for a list of control variables.
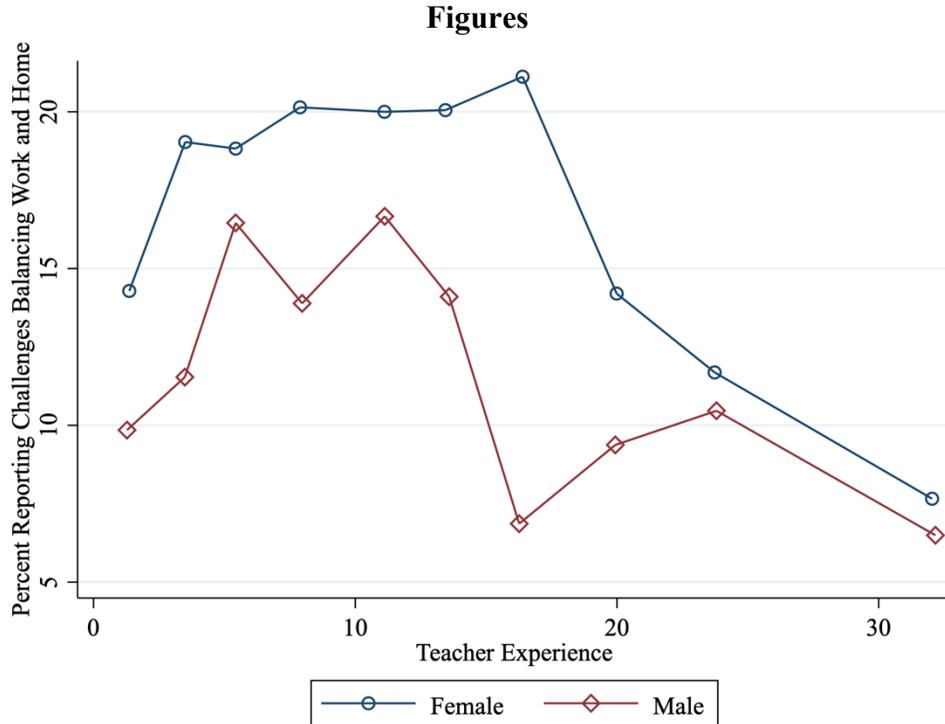
Figure 1. Challenges Balancing Work and Home Responsibilities by Teacher Experience and Gender
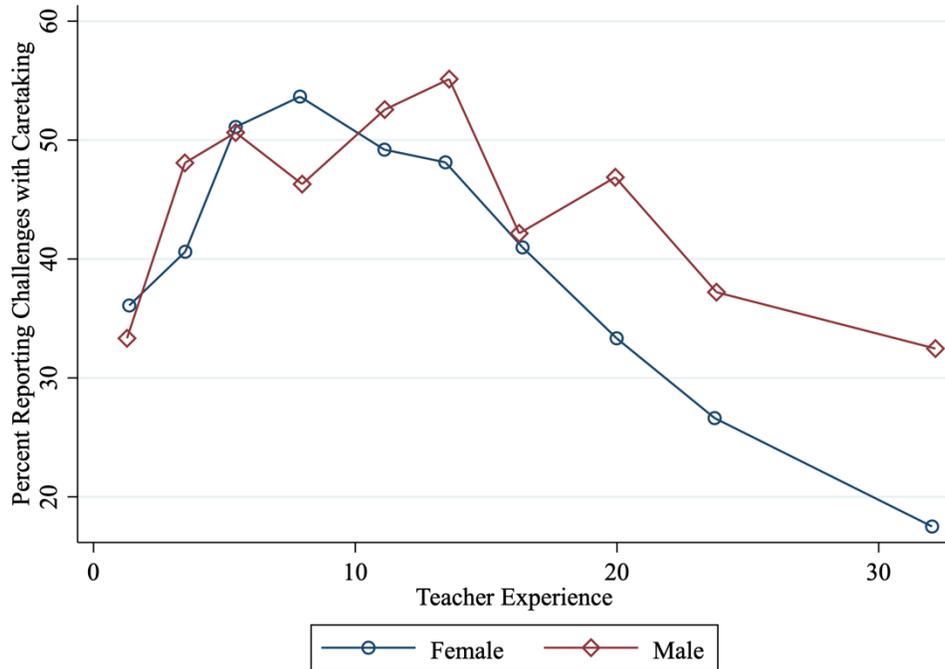
Figure 2. Challenges with Caretaking Responsibilities by Teacher Experience and Gender
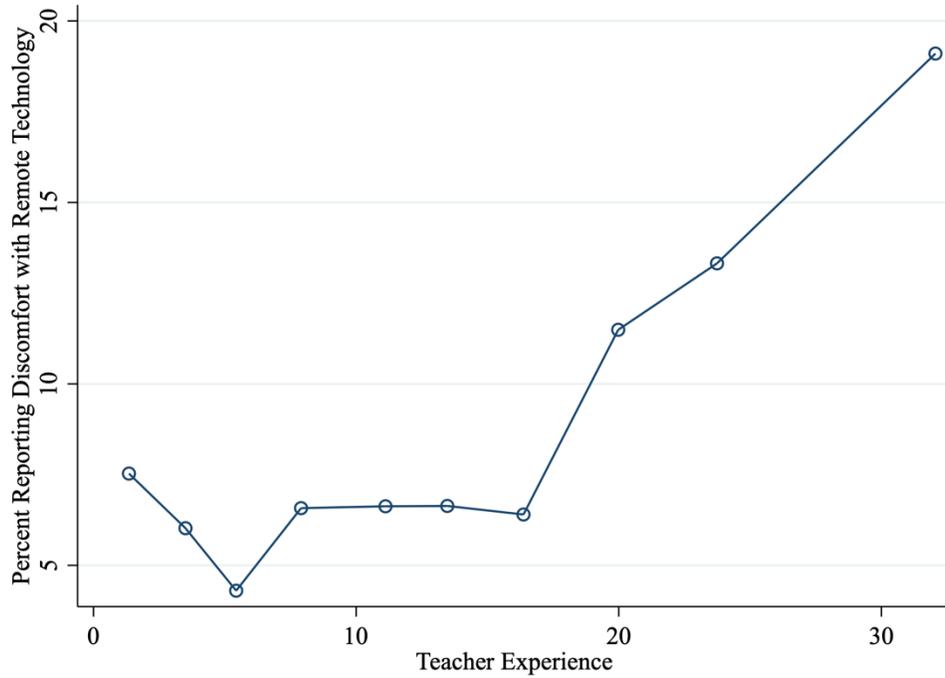
Figure 3. Challenges with Technology for Remote Learning by Teacher Experience
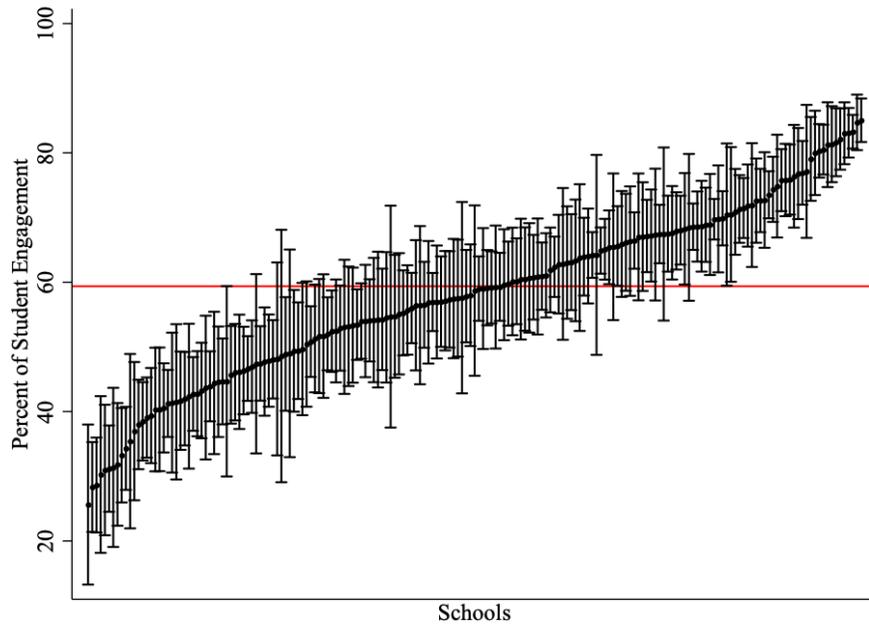
Figure 4. Variation in Average Student Engagement in Remote Learning Across Schools

Notes: Means (dots) and 95% confidence intervals (vertical lines) are reported for each school (n=206). The overall average (red line) across schools is 59%.
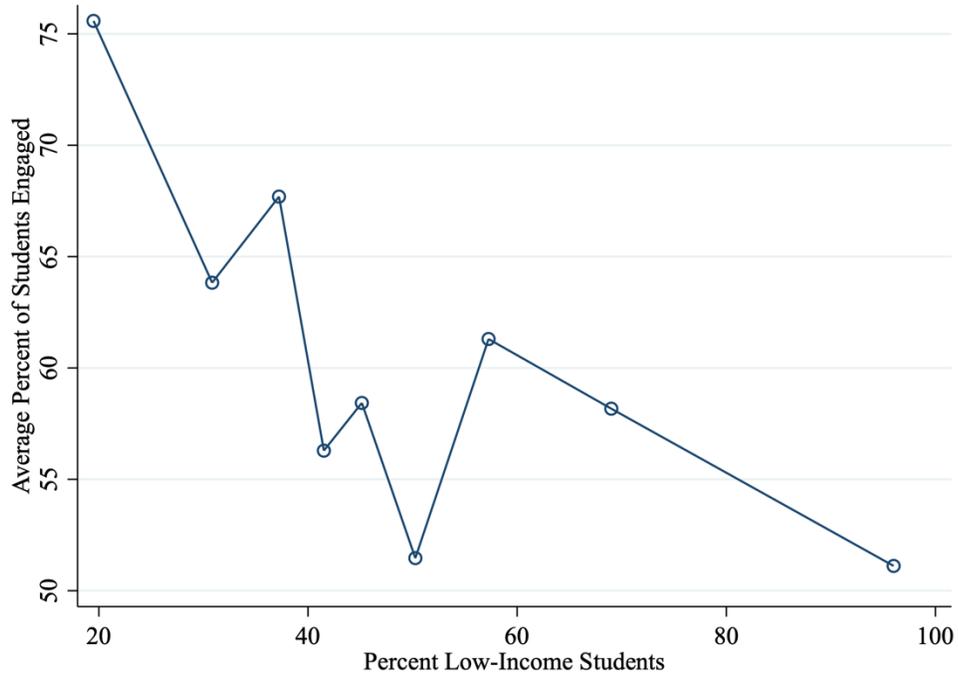
Figure 5. Differences in Student Engagement in Remote Learning by the Percent of Students from Low-Income Families in a School
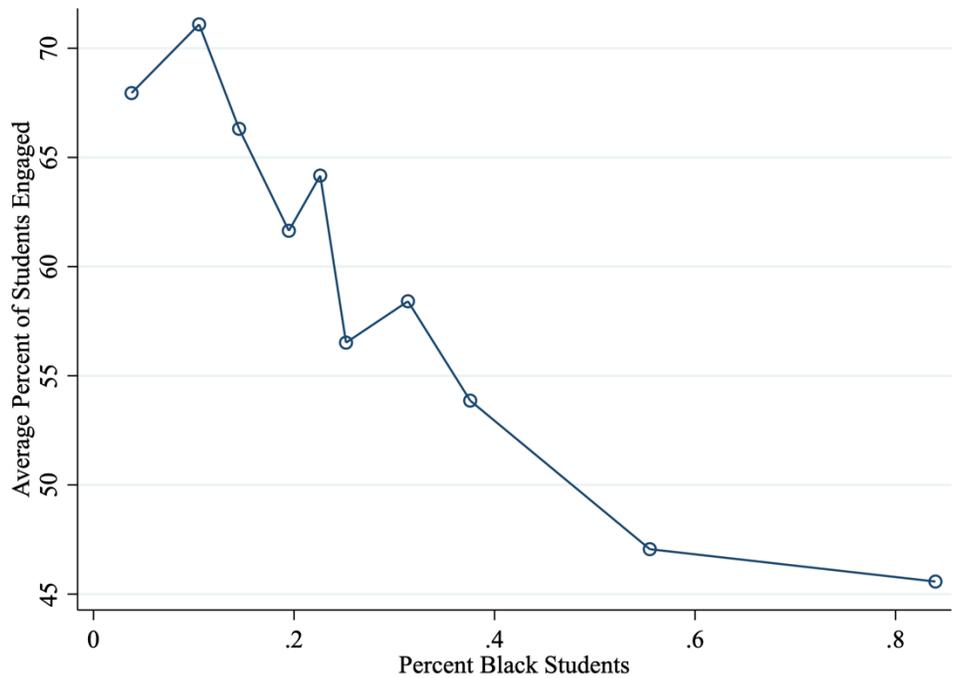
Figure 6. Differences in Student Engagement in Remote Learning by the Percent of Black Students in a School
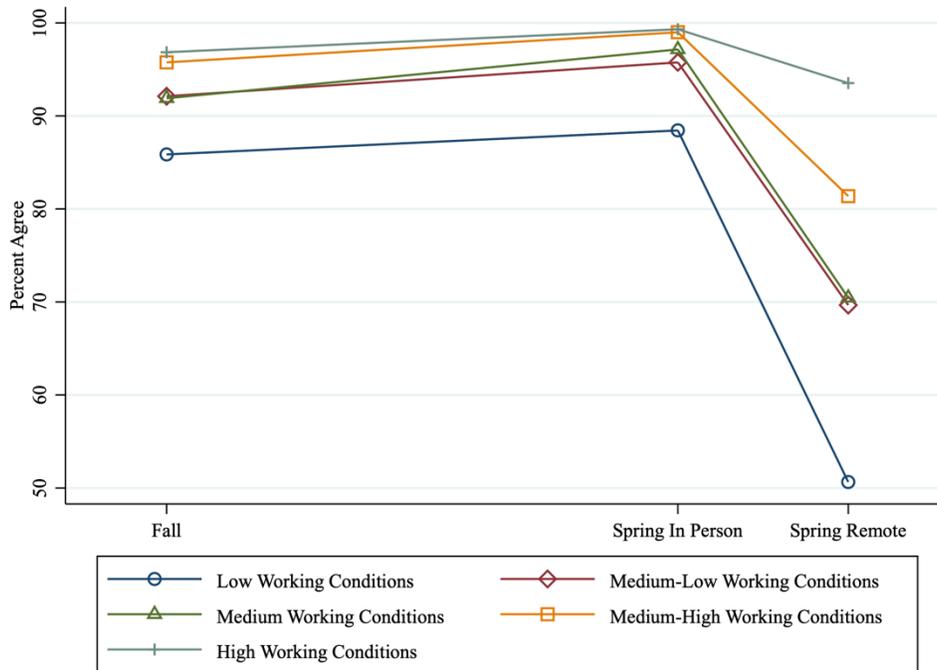
Figure 7. Changes in Teachers' Sense of Success by Quintile of Individual Working Conditions during Remote Teaching

Notes: Plotted estimates indicate the unadjusted percent of teachers agreeing or strongly agreeing that they feel successful teaching students for each time period within each quintile of spring remote working conditions.
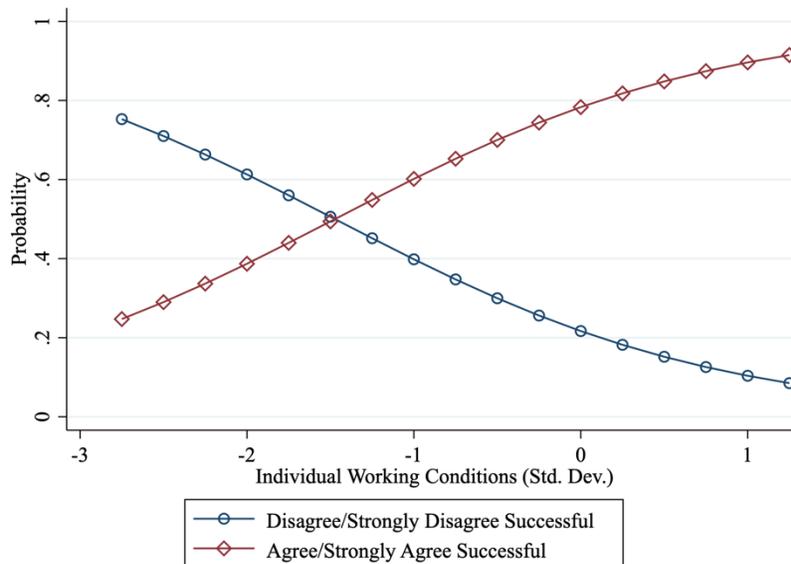
Figure 8. Conditional Predicted Probabilities of Teachers' Sense of Success by Individual Working Conditions During Remote Teaching

Notes: The predicted probabilities shown are derived from the fitted model produced by equation 4 and reported in Table 4 column 4. They depict the probability of a positive or negative response to the sense of success item during remote teaching across the range of values for teachers' self-reported individual working conditions during this same time. Estimates are conditional on prior levels of sense of success and the full set of controls described in Table 4.

Appendix A:

Introductory Text for Spring Upbeat Engagement Survey

Please answer the following questions based on your experiences working at your school PRIOR to COVID-19 school closures. We will ask you a set of questions at the end of the survey regarding your experience teaching remotely while schools are closed due to COVID-19.

Remote Teaching Survey

Please answer the following questions based on your recent experiences teaching remotely while schools are closed due to COVID-19.

Student Engagement

1. What percent of your students are regularly engaging in learning activities during this distance learning period?

| 0% to 20% | 21% to 40% | 41% to 60% | 61% to 80% | 81% to 100% |

Communication

2. My **district** has communicated clear guidelines to teachers about remote teaching in all of the phases of this distance learning period.

3. Administrators at my **school** have communicated with teachers in a clear and timely way during this distance learning period.

Collaboration

4. Teachers at my school are collaborating regularly with each other during this distance learning period.

Work/life balance

5. My **school** administrators' expectations about how much work I can accomplish have been fair during this distance learning period.

6. I have been able to balance my work with my other responsibilities at home during this distance learning period.

7. Caretaking responsibilities for children and/or dependent adults have made it difficult to do my job during this distance learning period.

Self-efficacy

8. I have felt successful at supporting my students' academic development during this distance learning period.

9. I have felt successful at supporting my students' social/emotional well-being during this distance learning period.

10. I am comfortable using the technological tools required for remote teaching during this distance learning period.

Recognition

11. I have felt appreciated by my school administration during this distance learning period.

Resources

12. My students have had the technological tools they need to engage in virtual learning during this distance learning period.

Professional Development

13. My district has provided helpful professional development for teaching remotely during this distance learning period.

14. My district has provided helpful professional development for how I can support my students' social/emotional well-being during this distance learning period.

Appendix Tables

Table A1. Sample District Characteristics

School District	State	Urbanicity	Date of School Closure	Remote Learning Start Date	New COVID-19 Cases (per Capita) on April 20th	State COVID-19 Rt	# of Survey Respondents	Remote Learning Plans
District A	NY	Urban	March 15th	March 23rd	53.4	1.56	15	*Specific Teacher Instruction:* Teachers across county were in their respective school buildings Tuesday, March 17th to begin remote teaching training and to begin rolling out material by March 23rd. *Delivery Form:* Google Classroom and instructional packets; District distributed devices to students. *Grading Policy:* Elementary and Middle schools switched to a "meets standards"/ "needs improvement" grading style. High school students received standard grading but had the option of changing courses to Pass/Fail.
District B	IL	Urban	March 13th	March 16th	18.4	2.18	73	*Specific Teacher Instruction*: Teachers were expected to deliver 2 hour lessons to students on Google Classroom and to host office hours for students. *Delivery Form:* Google Classroom and instructional packets; District distributed devices to students. *Grading Policy:* District implemented Pass/Fail policy.
District C	IL, MI	Urban	March 13th	March 16th	18.4 18.6	2.18 1.33	242	*Specific Teacher Instruction:* Beginning March 27th, teachers spent Fridays collaboratively planning at-home learning lessons. Teachers also facilitated virtual morning meetings with their classrooms and held one-on-one sessions with their students. *Delivery Form:* Google Classroom, Zoom, Seesaw, and printable weekly learning packets; District distributed devices to students. *Grading Policy:* Work completed by students could only improve their grades.

District	State	Locale						Notes
District D	SC	Rural	March 15th	March 17th	0.9	1.71	194	*Specific Teacher Instruction:* Teachers expected to provide students with feedback on instructional packets. *Delivery Form:* Google Classroom and instructional packets; District distributed devices and also deployed Wi-Fi-enabled buses starting March 26th. *Grading Policy:* Work completed during initial two weeks of closure were not included in report cards of the third quarter.
District E	VA	Rural	March 13th	March 19th	0	2.14	58	*Specific Teacher Instruction:* March 16th was a designated Teacher Workday. This day was taken to prepare instructional plans in the case schools were closed for an extended period of time. During closure, teachers were expected to hold virtual office hours. *Delivery Form:* Instructional packets were available every two weeks for pick-up; District distributed devices to students. *Grading Policy:* All grading stopped during school closure. Final grades represent grades prior to school closure.
District F	SC	Suburban but mix	March 15th	March 18th	4.1	1.71	4,784	*Specific Teacher Instruction:* Teachers were tasked with uploading materials to eLearning sites and to have availability for virtual student meetings and calls. *Delivery Form:* Google Classroom and instructional packets; District distributed devices to students. *Grading Policy:* Students were mostly graded on engagement and participation during e-Learning. Engagement is measured by work completion, phone calls, Google Meets or any other form of engagement with the teacher.
District G	TX	Suburban	March 19th	March 23rd	3.6	1.75	402	*Specific Teacher Instruction:* Phase 1 of the Instructional Continuity Plan involved teachers posting resources/assignments on the eLearning website. Phase 2 included teachers posting assignments and instructions on Google Classroom, Echo, and other online sources. Unlike phase 1, these assignments are not optional. *Delivery Form:* Google Classroom, Echo, and other eLearning sources at discretion of schools; District distributed devices to students. *Grading Policy:* Grades K-12 will have a Pass/Fail/Incomplete grading system.

District								
District H	GA	Suburban	March 13th	March 16th	5.9	2.08	1,034	*Specific Teacher Instruction:* Teachers to provide both digital and on paper instructional packets for students to work on. They will continue to provide assignments and accept them until May 15th. *Delivery Form:* Google Classroom and instructional Packets; District distributed devices to students. *Grading Policy:* Grades will only be recorded if they improve a student's grade.
District I	VA	Rural	March 13th	April 13th	2.7	2.14	319	*Specific Teacher Instruction:* Teachers provided students with preliminary instructional plans on March 13th, which included an instructional packet of 10 days worth of academic content. On March 27, faculty members met with principals via ZOOM to discuss remote learning. Teachers are expected to communicate and provide feedback to students a minimum of once per week. *Delivery Form:* Google Classroom and instructional packets; District distributed devices to students. *Grading Policy:* Elementary students' work will not be graded; feedback on assignments will be provided. Secondary students are encouraged to complete assignments. If not, assignments will be made up during remediation time during the 2020-2021 academic school year.
District J	VT	Rural	March 15th	March 18th	0	1.14	190	*Specific Teacher Instruction:* On March 16th, there was a delayed two hour opening for students. Teachers and staff arrived earlier to begin planning in case of a long-term school closure. Under guidance of Agency of Education, teachers were tasked to initially plan work of "maintenance of education." By April 13th, teachers switched to "Continuance of Education." Teachers were tasked with creating a planning document ahead of April 13th, which had to be submitted to their principals. *Delivery Form:* Google Classroom and instructional packets; District distributed devices to students. *Grading Policy:* Schools in district released individual grading plans.

District K	LA	Suburban	March 13th	March 16th	35.5	2.22	385	*Specific Teacher Instruction:* Each school developed their own requirements and schedule for teachers. During phase III of remote learning, which began April 20th and April 27th depending on grade level, teachers were expected to provide students with mandatory work and provide feedback. Unlike prior phases, phase III emphasizes the continuance of learning and made all assignments mandatory for students. *Delivery Form:* Google Classroom and instructional packets; District distributed devices to students. *Grading Policy*: no information available.
District L	IL	Urban	March 13th	March 16th	18.4	2.18	99	*Specific Teacher Instruction:* Teachers were tasked with tracking and monitoring student engagement on a weekly basis. *Delivery Form:* Google Classroom and instructional packets; District distributed devices to students. *Grading Policy:* Grades entered during remote learning can only improve students' grades.
District M	IL	Urban	March 13th	March 18th	18.4	2.18	35	*Specific Teacher Instruction:* Each day teachers will offer a three hour window check-in for students and parents to ask questions about assignments. *Delivery Form:* Google Classroom and instructional packets; Districts distributed devices to students. *Grading Policy:* Grading protections in place to ensure students with limited access to technology and supports are not penalized.
District N	IL	Urban	March 13th		18.4	2.18	29	No information available

District O	IL	Urban	March 13th	April 13th	18.4	2.18	21	*Specific Teacher Instruction:* Teachers expected to hold office hours for students. *Delivery Form:* Google Classroom and instructional packets; District distributed devices to students. *Grading Policy:* For the third quarter, teachers can grade and count student work as long as it improves the student's grade. No student will receive a fourth quarter grade that falls below their third quarter grade. If the Q4 grade is below the Q3 grade, students will receive a Pass (P). If the student failed their courses, they received an incomplete.

Notes: To find districts' remote learning information, we first looked at district websites. We then proceeded to search for articles from local news outlets. If data on the above indicators were still missing, we checked district Facebook and Twitter accounts. As a last resort, we contacted districts directly via email and phone. Dates of school closure announcements refer to the initial school closure announcement made by the state's governor. The Rt scores listed correspond to the day of the initial closure announcement. Rt scores indicate how quickly the virus is growing. When Rt is less than 1, this means that the spread of the virus is slowing down. Rt scores greater than 1 mean that the virus is spreading quickly. The number of cases in each county are listed per 100,000 residents. Per capita numbers are from April 20th, 2020, which, at the time, was considered a peak day in the United States. All per capita numbers were obtained from CovidActNow, while Rt scores were retrieved from rt.live.

Table A2. Variance Decomposition of Working Conditions and Sense of Success

	Sense of Success		Individual Working Conditions	
	Variance	Proportion of Total Variance	Variance	Proportion of Total Variance
Between Schools (School ICC)	0.029***	0.056	0.158***	0.154
	(0.004)		(0.018)	
Between Teachers (Teacher ICC)	0.092***	0.178	0.481***	0.468
	(0.004)		(0.010)	
Within Teachers	0.396***	0.769	0.390***	0.380
	(0.004)		(0.005)	
n (Teacher-periods)	21,978		21,980	

Notes: *** $p<.001$

Table A3. Turnover Rates by Sense of Success and Working Conditions

	Spring, Remote	Spring, in Person	Fall
All Teachers	11.1%	11.1%	11.1%
By Sense of Success			
Strongly Disagree	11.8%	26.7%	23.3%
Disagree	12.1%	20.8%	13.7%
Agree	11.1%	11.5%	11.6%
Strongly Agree	9.2%	9.7%	9.6%
By Individual Working Conditions			
Quartile 1	14%	16%	14%
Quartile 2	13%	11%	12%
Quartile 3	10%	9%	11%
Quartile 4	8%	9%	8%
By Peer-Average Working Conditions			
Quartile 1	13%	13%	13%
Quartile 2	10%	10%	11%
Quartile 3	11%	11%	10%
Quartile 4	11%	10%	11%
n	5,533	5,533	5,533

Notes: Cells display the percent of teachers in the longitudinal sample that exited the district or transferred to new schools within the district at each of the three study time periods. Turnover is sightly understated because the sample is restricted to respondents who stayed and took the spring 2020 survey, thus excluding mid-year turnover. Differences in turnover rates across answer responses (e.g., strongly disagree v. strongly agree) tend to be larger when we use all non-missing respondents within a given period. Two districts (District D and District I) are removed from the sample because they did not administer Upbeat surveys in the fall of 2020.

Table A4. Sense of Success and Working Conditions Constructs and Questions by Period

Construct	Fall and Spring *Teacher Engagement* Survey	Spring *Teaching From Home* Addendum
Sense of Success	I feel successful as a teacher.	I have felt successful at supporting my students' academic development during this distance learning period.
Professional Development	My school offers support to help teachers improve.	My district has provided helpful professional development for teaching remotely during this distance learning period.
	The professional development at my school has helped me to improve my work.	My district has provided helpful professional development for how I can support my students' social/emotional well-being during this distance learning period.
	This year, I've had opportunities to learn and develop as a professional.	
Communication	The expectations for the role that I was hired for were made clear during the interview and hiring process.	My district has communicated clear guidelines to teachers about remote teaching in all of the phases of this distance learning period.
	My Principal communicates a clear vision for teaching and learning for the school.	Administrators at my school have communicated with teachers in a clear and timely way during this distance learning period.
Recognition	The administration at this school lets me know when I do good work.	I have felt appreciated by my school administration during this distance learning period.
	Teachers are recognized publicly when they do outstanding work.	
	The administration at this school notices how hard I work.	
Collaboration	How often do you talk with other teachers about best practices in your work?	Teachers at my school are collaborating regularly with each other during this distance learning period.
Professional Expectations	The work/life balance at my school is fair to teachers.	My school administrators' expectations about how much work I can accomplish have been fair during this distance learning period.

Table A5. Longitudinal Analysis of Teachers' Sense of Success Moderated by Working Conditions Measured at Three Time Periods

	(1)	(2)	(3)	(4)	(5)	(6)
Remote Learning	0.148***	0.152***	0.149***	0.147***	0.147***	0.146***
	[-30.11]	[-28.75]	[-29.09]	[-31.17]	[-30.42]	[-30.75]
Spring, in Person	1.044					
	[0.93]					
Remote Learning*Individual WC (Fall)	1.713***	1.697***	1.685***	1.719***	1.717***	1.715***
	[13.17]	[13.21]	[13.16]	[13.21]	[13.23]	[13.23]
Remote Learning*Individual WC (Spring, in Person)		1.360***				
		[6.73]				
Remote Learning*Individual WC (Spring, Remote)			2.051***			
			[14.79]			
Remote Learning*Peer-Average WC (Fall)				0.932		
				[-1.43]		
Remote Learning*Peer-Average WC (Spring, in Person)					0.984	
					[-0.30]	
Remote Learning*Peer-Average WC (Spring, Remote)						1.101+
						[1.81]
n(Observations)	17,871	17,871	17,871	17,871	17,871	17,871
n(Teachers)	5,957	5,957	5,957	5,957	5,957	5,957
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: + $p<.10$, *** $p<0.001$. Each column displays results from a separate ordered logistic regression of sense of success regressed on remote learning and the interaction between remote learning and working conditions. Estimates are reported as proportional odds ratios. Robust standard errors are clustered at the school level and t-statistics are reported in brackets. Teachers' sense of success is measured by ordinal questions on the *Teacher Engagement* surveys and *Teaching from Home* addendum. Working conditions are measured by a PCA on a series of questions regarding professional development, communication, recognition, collaboration, and professional expectations from the *Teacher Engagement* surveys and *Teaching from Home* addendum. See Table 3 for a list of control variables.

Table A6. Lagged Dependent Variable Models of the Relationship Between Working Conditions Measured at Three Time Periods and Changes in Teachers' Sense of Success

	Fall	Spring, in Person	Spring, Remote
	Panel A: Individual Working Conditions		
Working Conditions	1.232***	1.474***	2.245***
	[6.13]	[10.25]	[18.42]
	Panel B: Peer-Average Working Conditions		
Working Conditions	1.024	1.070+	1.152***
	[0.62]	[1.83]	[3.48]
n	5,957	5,957	5,957
Lagged Success Indicators (VAM)	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Lagged Working Conditions Indicators	No	No	No

Notes: + $p<.10$, *** $p<0.001$. Each cell displays results from a separate ordered logistic regression of sense of success regressed on working conditions at each time period. Estimates are reported as proportional odds ratios. Robust standard errors are clustered at the school level and t-statistics are reported in brackets. Teachers' sense of success is measured by ordinal questions on the *Teacher Engagement surveys* and *Teaching from Home* addendum. Working conditions are measured by a PCA on a series of questions regarding professional development, communication, recognition, collaboration, and professional expectations from the *Teacher Engagement surveys* and *Teaching from Home* addendum. See Table 3 for a list of control variables.

Table A7. Correlation Matrix of Working Conditions Indicators

|	Fall Individual Working Conditions	Spring Individual Working Conditions, in Person	Spring Individual Working Conditions, Remote	Fall Peer-Average Working Conditions	Spring Peer-Average Working Conditions, in Person	Spring Peer-Average Working Conditions, Remote
Fall Individual Working Conditions	-					
Spring Individual Working Conditions, in Person	0.640***	-				
Spring Individual Working Conditions, Remote	0.475***	0.690***	-			
Fall Peer-Average Working Conditions	0.352***	0.340***	0.260***	-		
Spring Peer-Average Working Conditions, in Person	0.339***	0.369***	0.305***	0.883***	-	
Spring Peer-Average Working Conditions, Remote	0.264***	0.312***	0.362***	0.681***	0.824***	-

Notes: *** $p<.001$. Estimates are Pearson correlation coefficients. Working conditions are measured by a PCA on a series of questions regarding professional development, communication, recognition, collaboration, and professional expectations from the *Teacher Engagement* survey and *Teaching From Home* addendum.

Table A9. Teachers' Perceptions of Remote Teaching During the Pandemic by Teacher and School Characteristics, District F Removed

	Panel A. Teacher Demographics									
	Average	Male	Female	Early Career	Mid-Career	Late Career	Asian	Black	Hispanic	White
Working Conditions	-0.18	-0.19	-0.16	-0.42	-0.24	-0.18	0.34	-0.06	-0.38	-0.14
Percent of Students Engaged	52.5	51.0	53.1	53.4	51.8	54.2	54.5	48.3	60.7	53.5
Challenges										
Lack of Student Access to Technology	33.6	32.1	33.0	36.0	28.9	28.8	32.4	30.1	33.7	33.3
Balancing Work & Home Responsibilities	15.2	11.2	16.0	17.4	15.9	13.2	11.8	13.9	24.6	14.2
Caretaking Responsibility	39.2	40.6	38.9	43.8	44.8	31.1	38.2	34.9	45.7	40.5
Discomfort with Technological Tools	9.9	8.5	10.5	10.1	9.6	20.1	2.9	8.7	11.4	9.8
n	3,074	598	2,370	178	270	219	34	727	175	1,648

	Panel B. Student Demographics						
	Average	<10% Black	Majority Black	<10% Hispanic	Majority Hispanic	Low Poverty	High Poverty
Working Conditions	-0.18	-0.44	-0.09	-0.15	-0.21	0.29	-0.25
Percent of Students Engaged	52.45	62.57	45.63	50.71	63.03	59.40	52.85
Challenges							
Lack of Student Access to Technology	33.6	24.1	36.3	33.0	32.9	24.6	34.5
Balancing Work & Home Responsibilities	15.2	22.7	14.4	15.8	15.4	14.8	14.8
Caretaking Responsibility	39.2	43.2	37.9	39.3	40.1	47.5	37.4
Discomfort with Technological Tools	9.9	14.6	7.0	10.7	7.7	8.7	7.6
n	3,074	410	1,134	1,787	571	183	812

	Panel C. School Characteristics								
	Average	Elementary	Middle	High	Traditional	Charter	Low Prior Achievement	Middle Prior Achievement	High Prior Achievement
Working Conditions	-0.18	-0.11	-0.27	-0.30	-0.20	-0.08	-0.10	-0.21	-0.32
Percent of Students Engaged	52.5	51.7	45.9	50.5	51.5	57.7	48.4	57.7	55.8
Challenges									
Lack of Student Access to Technology	33.6	32.4	39.2	37.4	35.3	24.4	36.9	32.5	28.0
Balancing Work & Home Responsibilities	15.2	14.7	17.5	12.6	14.9	16.6	14.9	15.9	15.2
Caretaking Responsibility	39.2	41.8	35.3	39.0	39.1	39.3	38.7	41.2	38.2
Discomfort with Technological Tools	9.9	11.9	5.3	7.6	10.7	5.5	7.2	10.5	14.6
n	3,074	1,378	416	708	2,598	476	1,562	711	801

Notes: We display the overall and subgroup averages for student engagement and other reported challenges with District F removed. See notes in Table 2 for variable descriptions.

Appendix Figures
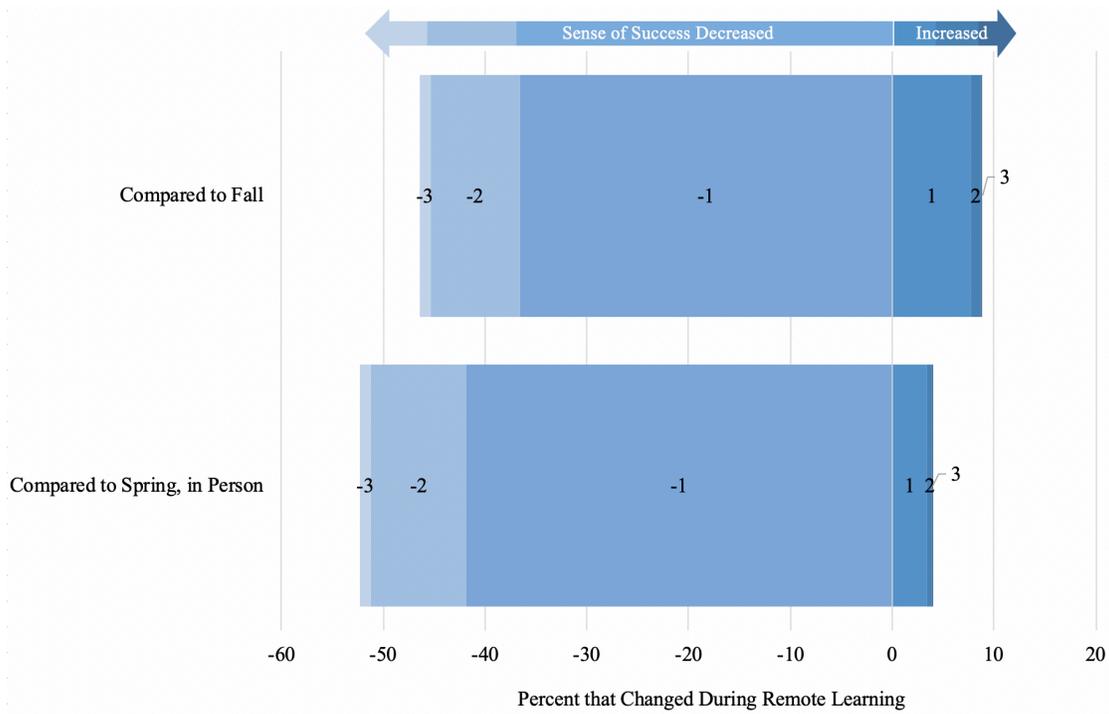
Figure A1. Changes in Likert Response Values of Teachers' Sense of Success During Remote Learning

Notes: Value labels on bars indicate the change in the Likert response values of sense of success during remote learning. The x-axis indicates the percent of teachers reporting each level of change.