Both sides of the screen: Predictors of parents' and teachers' depression and food insecurity during COVID-19-related distance learning

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ABSTRACT

The COVID-19 pandemic has placed unprecedented strains on both parents and teachers, both of whose mental and financial hardships have serious implications for young children's wellbeing. We drew on an existing cohort study of families with low incomes in Tulsa, OK when children were in their Spring of first grade in 2020. We surveyed parents and teachers – children's caregivers on both sides of the screen during distance learning – before and after the COVID-19 pandemic hit and schools were closed. We first compared the proportion of parents and teachers who were depressed and food-insecure before and after the pandemic struck. We then used pre-pandemic characteristics of parents and teachers in separate models to predict their depression and food insecurity during the pandemic. Results showed that rates of depression among both parents and teachers spiked after COVID-19, and food insecurity rates also increased among parents. For both parents and teachers, the strongest predictor of depression during COVID-19 was having experienced depression before the pandemic. Similarly, the strongest predictor of food insecurity during COVID-19 was having experienced food insecurity beforehand. These results point intervention efforts towards identifying the caregivers of children in low-income contexts whose mental and financial wellbeing are likely to be most compromised during this and perhaps future disasters.

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In the spring of 2020, the COVID-19 pandemic transformed the two primary contexts for young children's development: home and school. Following stay-at-home orders, children began conducting all school activities remotely from home (Education Week, 2020). This transition placed new demands on parents, especially those of younger children who needed help learning remotely, as well as on their teachers, who abruptly shifted to a new instructional mode (Benner & Mistry, 2020). At the same time, parents and teachers faced other stressors related to COVID-19. Many adults in parents' and teachers' households were temporarily or permanently laid off, leading to income loss and associated hardships (Kochhar, 2020). By the summer of 2020, 62% of families with children ages 8 and younger reported serious financial problems (NPR et al., 2020). One indicator of financial hardship, food insecurity, grew more preva-

lent than at any point in the previous decade (Schanzenbach & Pitts, 2020).

Not surprisingly, the onset of COVID-19 also saw marked increases in parental distress. In one national survey, 43% of parents said they were anxious and 22% said they were depressed as a result of COVID-19 (Bailey, 2020). The proportion of parents who reported that their mental health had worsened after COVID-19 was highest among parents of children ages 12 and younger, perhaps because of disruptions to child care and supervision arrangements (Patrick et al., 2020). Thus, as of the spring of 2020, there was great cause for concern about a generation of children whose parents were exposed to the combined financial and mental health hardships posed by COVID-19.

Amplifying this concern was the fact that children's teachers were also in crisis. Like all adults, teachers faced COVID-19-related stressors in the spring of 2020, but they also faced challenges associated with the sudden transition to distance learning, including a lack of training and unequal access to technology among their students (Feiner, 2020; Kraft, Simon, & Lyon, 2020). On average, teachers reported working 6 more hours per week than they had before

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COVID-19 (Kaufman & Diliberti, 2021). Many teachers also experienced the dual challenge of having to teach while managing their own children at home (Hamilton et al., 2020; Marshall, Shannon, & Love, 2020). In one national study of teachers, 73% reported feeling successful teaching students, compared to 96% the previous spring (Kraft et al., 2020). Teachers also experienced declines in financial wellbeing due to job and income loss suffered by other adults in their households (Nagasawa & Tarrant, 2020). Teachers already earn less than other professionals with comparable educations, and in more than half of states, teachers earn less than the living wage (minimum income needed to cover basic expenses; Katz, Apfelbaum, Frank, & Miles, 2018). Indeed, following the COVID-19 outbreak in the spring of 2020, 60% of teachers nationwide reported that paying bills was a concern (Hamilton et al., 2020).

The current paper is among the first to explore the prevalence and predictors of mental and financial hardships experienced by caregivers on both sides of the distance learning screen – parents at home and teachers remotely. First, we examine depression, one indicator of mental hardship, and food insecurity, one indicator of financial hardship, in both the parents and teachers of first graders in Tulsa, OK, comparing rates before and after COVID-19 broke out and schools transitioned from in-person to distance learning. We then ask whether caregivers who had experienced depression or food insecurity before COVID-19 were at heightened risk of those hardships during COVID-19; whether risk factors for depression and food insecurity during nonpandemic times also predicted these outcomes during COVID-19; and whether emerging challenges for parents and teachers during COVID-19 predicted depression and food insecurity in particular. By capitalizing on ongoing data collection in a sample of families with low incomes – a subgroup hit hard by COVID-19 – we aim to identify potential opportunities to support parents and teachers.

1. Theoretical background

Scholars examining the impact of COVID-19 on child and family wellbeing have referred to a process of cascading influences to conceptualize the cumulative effect of pandemic-induced disruption (Prime, Wade, & Browne, 2020). This conceptualization, which traces the effect of disruption on children to its impacts on key adults who shape children's environments – including parents and teachers – draws on widely-cited systemic models of human development and family functioning, including the bioecological model (Bronfenbrenner & Morris, 2006) and the Family Stress Model (Conger & Elder, 1994). Bioecological theory identifies parents and teachers as drivers of development insofar as children's relationships with those adult caregivers constitute proximal processes shaping their wellbeing, while these proximal processes are themselves shaped by distal factors such as the job or income loss occasioned by a pandemic. The Family Stress Model posits that social and economic disruptions like those caused by COVID-19 will impact children via their impacts on caregiver wellbeing. Together, these theories suggest that the disruption caused by COVID-19 will negatively impact children by undermining the mental and financial wellbeing of their key adult caregivers.

2. Parents' mental and financial wellbeing: impacts and predictors

Parents' mental and financial wellbeing both critically influence child development. Children whose parents are depressed are at heightened risk of developing their own mental health problems because their parents are more withdrawn, less sensitive, harsher, or less affectionate (Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Mendes et al., 2012; Wachs, Black, & Engle, 2009). Parents' financial status also directly affects their children's development.

Parents with lower incomes may be less able to afford stimulating materials for their children and may have less time to spend on learning activities than higher-income parents (Gershoff, Aber, Raver, & Lennon, 2007; Linver, Brooks-Gunn, & Kohen, 2002; Yeung, Linver, & Brooks-Gunn, 2002). Further, due to the stresses of economic hardship, they may demonstrate more punitive and less sensitive interactions than other parents (Mistry, Vandewater, Huston, & McLoyd, 2002; Yeung et al., 2002).

Household food insecurity, which overlaps with but is distinct from low-income status, is linked to poorer child academic and especially social-emotional development (Belsky, Moffitt, Arseneault, Melchior, & Caspi, 2010; Grineski, Morales, Collins, & Rubio, 2018; Jackson & Vaughn, 2017; Johnson & Markowitz, 2018b; Kimbro & Denney, 2015; Melchior et al., 2009). For example, children who experience food insecurity between kindergarten and 3rd grade exhibit less growth in academic and social-emotional outcomes, controlling for other demographic risk factors (Jyoti, Frongillo, & Jones, 2005).

An extensive literature documents the predictors of parent depression and food insecurity during nonpandemic times. Unfortunately, many of these predictors are especially prevalent among families who have faced systemic discrimination, limited educational and economic opportunities, and insufficient access to health and social service resources, often over multiple generations. For example, financial strain is a robust risk factor for depressive symptoms, through a process described by the Family Stress Model (Conger & Elder, 1994; Jackson, Brooks-Gunn, Huang, & Glassan, 2000; Mistry et al., 2002; Yeung et al., 2002). Additionally, single mothers, who report lower social support and less social contact than married mothers, are also at increased risk of depression (Cairney, Boyle, Offord, & Racine, 2003), as are younger mothers (Wang, Wu, Anderson, & Florence, 2011), mothers with less education (Horwitz, Briggs-Gwan, Storfer-Isser, & Carter, 2007), those with greater household chaos (Hur, Buettner, & Jeon, 2015; Pike, Iervolino, Eley, Price, & Plomin, 2006), and those facing discrimination (Odom et al., 2010). Documented predictors of food insecurity during nonpandemic times are associated with poverty status and include being single, having lower levels of formal education, having more children, and being from a minoritized racial/ethnic or linguistic background, as well as poverty itself (Bhargava, Jolliffe, & Howard, 2008; Coleman-Jensen, 2012; Hunt, Benjamins, Khan, & Hirschtick, 2019). Household chaos may also be a risk factor for food insecurity (Belsky et al., 2010; Fiese, Gundersen, Koester, & Jones, 2016; Pinard, Calloway, Fricke, & Yaroch, 2015), if, for instance, families with high levels of disorganization and low levels of routines struggle to plan meals and stretch food budgets, or if household crowding (another dimension of chaos) taxes available food resources.

In sum, the literature shows that many indicators of socialeconomic disadvantage predict both depression and food insecurity among parents. Yet it is unclear how well past associations will apply during the COVID-19 pandemic. Because of the grave implications of parents' mental and financial wellbeing for child development, it is essential to identify the parents who are at greatest risk of experiencing poor outcomes during the pandemic.

3. Parents' mental and financial wellbeing during the COVID-19 pandemic

The outbreak of COVID-19 had negative consequences for all adults, but it posed specific challenges for parents. Parents reported problems sustaining their children's remote learning, difficulty helping children adjust to major life changes, and increased family conflict (Center for Translational Neuroscience [CTN], 2020b; NPR et al., 2020). They also had trouble with household food security. In nationally representative surveys, 36% of parents re-

ported that they sometimes or often could not afford enough to eat (Patrick et al., 2020), 31% reported that COVID-19 had resulted in reduced spending on food for their family (Karpman, Zuckerman, Gonzalez, & Kenney, 2020), and 8% reported not getting enough to eat every day (NPR et al., 2020).

Due to the unprecedented nature of the pandemic, there is little evidence to suggest which pre-COVID-19 characteristics best predict parental mental and financial wellbeing during COVID-19. The current patterns of impacts, as well as past research on economic and natural disasters, provide some clues as to plausible predictors, but these may differ by outcome. We review these clues now with respect to depression, a key indicator of mental wellbeing, and food insecurity, a key indicator of financial wellbeing.

3.1. Depression

The effect of COVID-19 on parental depression appears to be greatest among families with low incomes (CTN, 2020c). This is likely due in part to greater hardships imposed by economic setbacks given that lower income and joblessness are both associated with greater mental distress (Holingue et al., 2020). In a study of parents of children ages 2-7 living in low-income homes, daily negative mood rose significantly after COVID-19 broke out as a function of job loss, income loss, household illness, or caregiving burden (Gassman-Pines, Oltmans Ananat, & Fitz-Henley, 2020). In one nationally representative sample of parents of young children, parents' emotional distress was higher the more financial and material hardships they reported (CTN, 2020d). In fact, parents' reports of hardships one week were associated with reports of increased emotional distress the following week. Other risk factors for depression during COVID-19 include lower education and single parent status (Bailey, 2020; CTN, 2020e).

These demographic patterns are consistent with previous research on economic and natural disasters. Generally, adults who are single, are not White, and have less education are more vulnerable than others to depressive symptoms following a disaster (Goldmann & Galea, 2014; Lowe, Bonumwezi, Valdespino-Hayden, & Galea, 2019; Tang, Liu, Liu, Xue, & Zhang, 2014). However, it is as yet unknown which demographic characteristics should be most predictive when considered jointly. For example, parents with low incomes have been hit harder emotionally and financially by COVID-19 than other parents (CTN, 2020c), but little is known about the factors *within* these families that might predispose some to worse outcomes than others.

Further, it is unknown whether these demographic characteristics will remain predictive when accounting for other pre-COVID-19 characteristics with which they covary. For example, because single mothers were already more vulnerable to depression before COVID-19 (Cairney et al., 2003), their greater susceptibility to depression during COVID-19 may be a function of their prior depression status rather than their single parent status. However, a panel study following adults (not just parents) before and after The Great Recession found that those who were less educated and single experienced greater psychological distress, net of pre-recession distress levels, in response to financial hardships (Forbes & Krueger, 2019).

Nevertheless, there is reason to suspect that pre-COVID-19 depression will in its own right predict depression during COVID-19. Life course theorists have long observed general continuity in both personality and behavior throughout the life span (Caspi & Roberts, 2001; Elder, 1998), and depression typically recurs over time (Solomon et al., 2000). The disaster literature provides additional support for the hypothesis that pre-COVID-19 depression will predict depression during COVID-19. In a study of Iowa residents assessed before and after severe flooding in the 1990s, greater preflood depressive symptoms predicted greater postflood

symptoms (Ginexi, Weihs, Simmens, & Hoyt, 2000). A study of low-income adults who lived through Hurricane Katrina found that those who experienced the most symptoms of distress before the disaster also did so after the disaster (Rhodes et al., 2010). Among parents assessed before and after Hurricane Sandy, those who experienced the most depressive symptoms before the hurricane did so afterwards too (Hausman et al., 2020).

Finally, additional family characteristics may predict parental depression during COVID-19 because they are likely to have made the sudden transition to remote learning particularly stressful. Anecdotally, parents of children with special needs and of English language learners have reported a great deal of difficulty with the transition to remote learning (Lazarin, 2020; Shapiro & Harris, 2020). In one survey from the spring of 2020, parents of a child with a disability were more than twice as likely to be depressed than other parents (64% vs 27%; CTN, 2020a).

3.2. Food insecurity

Not surprisingly, families with lower incomes have been more likely to cut back spending on food due to COVID-19 (Karpman et al., 2020). Additionally, food insecurity rates have been higher among certain racial/ethnic groups. In April 2020, 42% of Hispanic/Latinx families and 38% of Black families reported that their food just didn't last and they did not have money to buy more, compared to 33% of White families (Schanzenbach & Pitts, 2020). Single parents have also had higher rates of food insecurity, with nearly one-half reporting trouble paying for food compared to one-quarter of other parents (CTN, 2020e).

As with depression, past research on disasters suggests that families who experience the most severe financial hardships will be those with the highest levels of pre-existing disadvantage. For example, in a study of Hurricane Katrina's impacts on Mississippi's Gulf Coast residents 1 year later, households with greater financial resources were able to start rebuilding their homes, while those already in poverty remained jobless and living in trailer parks (Abramson, Garfield, & Redlener, 2007). Food insecurity 2-5 years later was also more common among adults who were single and non-White (Clay, Papas, Gill, & Abramson, 2018). Thus, income, race/ethnicity, and marital status may predict parental food insecurity during COVID-19 just as they did before. It is also possible, however, that some of those factors will lose predictive power after accounting for each other, for household chaos, or for food insecurity before COVID-19. Yet another possibility is that pre-COVID-19 depression will predict food insecurity during COVID-19, just as pre-COVID-19 food insecurity might predict depression during COVID-19. We now discuss these potential associations.

3.3. Associations between depression and food insecurity

Past evidence indicates a close relationship between depression and food insecurity. Nationally, parents with more depressive symptoms have greater food insecurity, net of other demographic risk factors (Bhargava et al., 2008). However, the direction of causality between poor mental health and food insecurity is complex, with both causal pathways finding support in the literature. In a sample of low-income women, the transition from food sufficiency to insufficiency was associated with entry into major depression (Siefert, Heflin, Corcoran, & Williams, 2004). Yet depression has also been found to increase the risk of food insecurity, perhaps by limiting employment (Garg, Toy, Tripodis, Cook, & Cordella, 2015; Hernandez, Marshall, & Mineo, 2014; Jacknowitz & Morrissey, 2012; Lent, Petrovic, Swanson, & Olson, 2009). One study explicitly tested for, and confirmed, bidirectional effects between the two (Huddleston-Casas et al., 2009). Whether this reci-

procity will be maintained when predicting outcomes during the COVID-19 pandemic is unknown.

4. Teachers' mental and financial wellbeing: impacts and predictors

The influence of teachers' mental health and financial status on child development is less well-understood than that of parents,' but both theory and research suggest consequences for the children in their classrooms. As with parents, we focus on teacher depression as a key indicator of teachers' mental wellbeing, and teacher food insecurity as a key indicator of teachers' financial wellbeing. Consistent with research linking parental depression to disrupted parent-child interaction, studies of teachers find that those who are more depressed provide less positive feedback to students (McLean & Connor, 2018), display more negative responses to children's emotions (Buettner, Jeon, Hur, & Garcia, 2016), and have more conflict with students (Whitaker, Dearth-Wesley, & Gooze, 2015). Depressed teachers also spend less time planning and organizing (McLean, Abry, Taylor, & Connor, 2018). Teachers' depression is also linked to lower observed instructional support, classroom organization, and overall classroom quality (Jeon, Buettner, & Snyder, 2014; Sandilos et al., 2015). Consistent with these findings, teachers' depressive symptoms are associated with greater problem behavior and fewer social skills among students (Hindman & Bustamente, 2019; Roberts, LoCasale-Crouch, Hamre, & DeCoster, 2016; but see McLean & Connor, 2015).

Some research also suggests that teachers' experiences of economic hardship might adversely effect their students. In one study of preschool teachers, greater financial wellbeing was associated with children's positive mood, positive affect, and classroom engagement (King et al., 2016). In another study of preschool teachers, higher salary was associated with higher observed instructional quality, as well as with children's growth in literacy (Johnson, Phillips, Partika, Tulsa SEED Study Team, & Castle, 2020; Johnson, Phillips, Schochet, Martin, Castle, & Tulsa SEED Study Team, 2021). While teacher food insecurity was not associated with instructional quality, it did predict small increases in children's disruptive behavior (Johnson et al., 2020; Johnson et al., 2021).

With respect to determinants of teacher mental and financial wellbeing, teachers with their own children at home are likely to share the same predictors as other parents. However, there are specific aspects of teachers' working lives that are also relevant. Teachers who receive lower salaries are more likely to experience depression (Roberts, Gallagher, Daro, Iruka, & Sarver, 2019), as are teachers with lower job satisfaction (Ferguson, Frost, & Hall, 2012). Class size, as well as the proportion of students with behavior problems, are risk factors for teacher stress (Friedman-Krauss, Raver, Morris, & Jones, 2014; Jeon & Ardeleanu, 2020; Wiley, 2000), and may be for depressive symptoms as well. Previous research also shows that teachers who report working in less supportive school climates experience more emotional distress (Gray, Wilcox, & Nordstokke, 2017). For example, teachers who report fewer available school resources, less input in decision-making, and less collaboration among teachers report higher workload stress (Collie, Shapka, & Perry, 2012).

Emerging research also suggests the possibility that teachers' executive function skills are inversely associated with depression. Executive functions are traditionally conceived of as higher order cognitive processes that enable planning, problem-solving, and goal-directed behavior in everyday life (Blair & Ursache, 2011; Miyaki, Friedman, Emerson, Witzki, & Howerter, 2000). Higher executive functions are generally associated with a lower incidence of depression (McDermott & Ebmeier, 2009), perhaps because poor cognitive control enables rumination, a central feature of depressive thought (Snyder & Hankin, 2016), but also perhaps because

executive function acts as a buffer against stress (Quinn & Joormann, 2020). A study of Head Start and Early Head Start classrooms found that higher teacher executive functioning scores were associated with lower job stress (Friedman-Krauss, Raver, Neuspiel, & Kinsel, 2014).

5. Teachers' mental and financial wellbeing during the COVID-19 pandemic

As with parents, it would be useful from a program and policy perspective to be able to identify teachers who are most likely to experience mental and financial problems as a result of COVID-19. This task takes on added value among teachers who primarily serve low-income children, who are already at elevated risk of stress and burnout (Bottiani, Duran, Pas, & Bradshaw, 2019). Yet, as with parents, little information is available to guide expectations about which teachers should be at greatest risk of depression and food insecurity during the pandemic. Because of the great overlap between parents and teachers, much of the preceding discussion about potential predictors of depression and food insecurity among parents should also apply to teachers. However, there are some circumstances unique to teachers that may have explanatory power when considering depressive symptoms during COVID-19.

Specifically, teachers – just like parents – of children with special needs appear to have been particularly distressed by the sudden transition to remote learning. Many teachers struggled to quickly adapt strategies to instruct and motivate students with special needs from in-person to remote learning, and found they needed more time to transition between activities (Marshall et al., 2020; Shapiro & Harris, 2020). Similarly, elementary school teachers have reported difficulties instructing English language learners remotely; these students' parents may have limited English proficiency and their families are less likely to have access to needed technology (Napolitano, 2020; Robles & Belsha, 2020). It is therefore possible that teachers with a greater proportion of students with special needs or who are English language learners have been more likely to be depressed during the COVID-19 pandemic.

6. The current study

Past literature on the effect of parents' and teachers' wellbeing on children signals an urgent need to understand which caregivers are likely to be adversely affected by the COVID-19 pandemic. This information is especially useful from a program and policy perspective with respect to children growing up in low-income contexts. These children already lag behind their more privileged peers academically and socioemotionally (Duncan & Magnuson, 2011; Reardon & Portilla, 2016; Waldfogel & Washbrook, 2011). Unfortunately, families already coping with low incomes also appear to have been hit hardest economically by COVID-19 (Karpman et al., 2020; Kirzinger, Kearney, Hamel, & Brodie, 2020). Past studies on the mental and financial impacts of natural or economic disasters, which typically lack predisaster data, provide little guidance to identify which parents, let alone which teachers, may be at greatest risk due to COVID-19.

The current study capitalizes on an existing cohort study following children from families with low incomes who entered public pre-k in Tulsa, OK in 2017. When COVID-19 erupted and instruction abruptly went online, the children were completing first grade, and both their teachers and parents were surveyed about their experiences during remote learning. The first study aim was to describe the prevalence of depressive symptoms and food insecurity among both parents and teachers shortly after the COVID-19 outbreak. The second aim was to identify potential predictors of parents' and teachers' depression and food insecurity during the first three months of the pandemic. Teachers had been surveyed

earlier in the school year, and parents had been surveyed the previous year. We use these "pre-COVID-19" data to predict depression and food insecurity among both parents and teachers in spring 2020 after COVID-19 emerged. Based on the literature reviewed above, predictors of depression and food insecurity included pre-COVID-19 measures of those outcomes, along with characteristics that predict depression and food insecurity during nonpandemic times or have emerged as risk factors for depression or food insecurity during the COVID-19 pandemic. For both parents and teachers, pre-COVID-19 depression was tested as a predictor of food insecurity during COVID-19, and pre-COVID-19 food insecurity was tested as a predictor of depression during COVID-19. Findings may be used to target resources to parents and teachers at highest risk for food insecurity and depression, hardships that prior evidence indicates pose risks to young children's learning and well-being.

7. Method

7.1. Participants

The Tulsa SEED Study enrolled children growing up in families with low incomes in the Tulsa Public School District at age 3 (in 2016-2017) or age 4 (in 2017-2018) to examine effects of public pre-k participation through fourth grade. Since then, both parents and then-current teachers have completed an annual survey about their wellbeing. On March 15, 2020, when children were in first grade, Tulsa schools closed in-person instruction and transitioned to remote learning. In May-July of 2020, teachers and parents were surveyed about their experiences during the COVID-19 school closures. These surveys provide the "during-COVID-19" measures of both depression and food insecurity for teachers and parents in the present study. To capture parents' "pre-COVID-19" predictors, we draw on the surveys they completed the previous spring (2019); although parents had completed an annual survey in 2020, the end of the data collection window overlapped with the beginning of COVID-19, so the previous year's survey responses were selected instead to ensure proper temporal ordering. To capture teachers' per-COVID-19 predictors, we draw on the survey they had just completed in the spring of 2020 immediately before COVID-19 emerged.

At the beginning of the 2019-2020 school year, there were 1240 students in the Tulsa SEED Study who were enrolled in schools in the Tulsa Public School District or in a public school in three surrounding suburban school districts to which some study children had moved. Of these, 582 (47%) had parents who responded to the Parent COVID-19 Survey, and 729 (59%) had teachers who responded to the Teacher COVID-19 Survey. Of the 582 children whose parents completed the Parent COVID-19 Survey, 475 also had completed the Parent Survey the previous spring. Eighty-nine of these were dropped from analysis because they were missing reports of depression or food insecurity at either timepoint, leaving a final analytic sample of 386 parents (90% mothers). Of the 118 teachers who completed the Teacher COVID-19 Survey, 114 had completed the Teacher Survey months before. After dropping 10 cases because they were missing information on depression or food insecurity at either timepoint, the analytic sample comprised 104 teachers. These teachers taught a total of 652 children in our sample.

Compared to students whose parents were excluded from the parent analytic sample due to missing data, those whose parents were included had higher family incomes, were more likely to be White and less likely to be Black or Hispanic/Latinx, had lower parental education, and were less likely to speak English as their primary language. Nevertheless, the parents in our analytic sample were generally socio-economically disadvantaged (Table 1). The average annual income was $29,417. Half the parents (52%) were

Table 1
Description of sample.

	M (SE) / %
Parents	
Unmarried (%)	52
Mother's age at child's birth	26 (.31)
Household size	4.58 (.09)
Child has documented disability (%)	9
Race/ethnicity (%)	
Black	20
Hispanic/Latinx	38
White	30
Other	12
Has HS education or less (%)	52
Annual HH income ($)	29,417 (1,212)
Primary HH language is Spanish only (%)	21
Teachers	
Race/ethnicity (%)	
Black	14
Hispanic/Latinx	5
White	65
Other	15
Annual HH income ($)	64,044 (3,025)
Unmarried (%)	42
Number of children in the home	.94 (.14)
Years of experience as teacher	11 (.97)
Years at current school	5.89 (.67)
Has MA or higher (%)	18

Notes. HS = high school; HH = household; MA = Masters of Arts degree.
Table presents averages across 25 multiply imputed data sets.

unmarried, and half (52%) had a high school education or less. The largest share of parents (38%) were Hispanic/Latinx, while 20% were Black, and 30% were White. Children were who were Native American (7%), multiracial (5%), or Asian American/Pacific Islander (1%) were classified together as "other" due to small cell sizes. Nine percent of children had a documented disability. In 21% of households, Spanish was the sole primary language. The primary language of other households was either English or a mix of English and Spanish or another language.

The majority of teachers were White (65%; Table 1). Fourteen percent were Black and 5% were Hispanic/Latinx. For purposes of analysis, those who were Hispanic/Latinx were classified together with those who were multiracial (9%) and Native American (7%) as "other" due to small cell sizes. The average teacher had one child at home, and 42% of teachers were unmarried. Teachers had an average of 11 years of teaching experience and 6 years of experience at their current school. The average annual income was $64,044, and 18% of teachers had a MA or higher.

7.2. Measures

7.2.1. Parent and teacher depression and food insecurity during the COVID-19 pandemic

The Parent and Teacher COVID-19 Surveys both asked respondents whether they had a period of one week or longer since the outbreak when they felt sad, empty, or depressed for most of the day, or they lost interest in most things like work, hobbies, and other things they usually enjoy, an item adapted from RAND Health's (1998) depression screener. Food insecurity for both sets of respondents was measured using 2 items from the US Department for Agriculture's Food Insecurity scale (Economic Research Service, 2012), adapted to refer to the period during distance learning caused by COVID-19 instead of the past 12 months: "We worried whether our food would run out before we got money to buy more" and "The food we bought just didn't last, and we didn't have money to get more." Food insecurity was coded

affirmatively if respondents indicated either item as being sometimes or often true (versus never true).

7.2.2. Parent pre-COVID-19 predictors

Parents' pre-COVID-19 depression, food insecurity, and other predictors were drawn from the Parent Survey they had completed during the children's kindergarten year. Depression was measured using the Center for Epidemiologic Studies Depression Scale (CES-D) Short Form (Andresen, Carter, Malmgren, & Patrick, 1993), which includes 10 items such as "I felt depressed" and "I was bothered by things that usually don't bother me." Respondents indicated how often they felt that way in the past week on a 4-point scale from 0 (*Rarely or none of the time - less than 1 day*) to 3 (*All of the time – 5-7 days*). Two items were reverse-coded before all items were summed to form a scale ($\alpha = 0.72$). Respondents scoring 10 or higher on this scale were considered to have elevated depressive symptoms. Food insecurity was measured using the same 2 items from the Parent COVID-19 Survey as described above (Economic Research Service, 2012), but using a timeframe of the past 12 months.

Parents were also asked to report if they were married, if their child had a documented disability, their highest level of education (1 = high school diploma/GED or less), their monthly household income, and the primary language in their household (all respondents indicated either English, Spanish, English *and* Spanish, or English and another language). Parents also reported on the people who lived in the same household as their child, allowing us to compute household size. Parental race/ethnicity and mother's age at child's birth had been self-reported by parents in earlier study waves.

Household chaos was assessed using the Confusion, Hubbub, And Order Scale (CHAOS; Matheny, Wachs, Ludwig, & Phillips, 1995). The CHAOS includes 15 items about the household environment (e.g., "You can't hear yourself think in our home" and "Our home is a good place to relax"). Items are rated on a 4-point scale from 1 (*very much like our home*) to 4 (*not at all like our home*). Negatively valanced items were reverse-coded and items were summed to create a total score ($\alpha = 0.82$). This total was then standardized ($M = 0$, $SD = 1$) to facilitate interpretation of regression results.

7.2.3. Teacher pre-COVID-19 predictors

Teachers' pre-COVID-19 predictors were drawn from a survey they completed before COVID-19 hit during the children's first grade year. Teachers were considered depressed if they answered affirmatively to a question asking if, in the last year, they felt sad, empty or depressed for most of the day or lost interest in most things like work, hobbies, and other things they usually enjoy for two weeks or longer (RAND Health, 1998). Food insecurity was measured using the same 2 items from the Teacher COVID-19 Survey (Economic Research Service, 2012), but with a reference to the past 12 months.

Teachers self-reported their race/ethnicity. In regression analyses, due to small cell sizes, groups except for White were combined into a single category. They also reported whether they were married and the number of children in their household.

The Webexec was used to assess teachers' executive function (Buchanan et al., 2010). This scale consists of 6 items describing concentration and attention problems (e.g., "difficulty seeing through something that you have started," "difficulty carrying out more than one task at a time," and "problems concentrating on a task"). Items were rated on a 4-point scale from 1 (*no problems experienced*) to 4 (*a great many problems experienced*). All items were reverse-coded and summed to create a total with higher scores indicating greater executive function ($\alpha = 0.91$). This score was then standardized ($M = 0$, $SD = 1$) to facilitate interpretation of regression results.

Job satisfaction was calculated based on 2 original items ("I look forward to coming to work most days" and "I plan to return to TPS [Tulsa Public Schools] as a teacher next year"). Both were endorsed on a 4-point scale from *strongly disagree* to *strongly agree*. Items were averaged and standardized ($M = 0$, $SD = 1$) to ease interpretation of regression results.

Positive school climate was assessed with 6 items capturing the supportiveness of the principal, cooperation among staff members, and help with enforcing rules and teaching children with special needs (Domitrovich, Li, Mathis, & Greenberg, 2019). Teachers endorsed each item on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Items were averaged into a single scale ($\alpha = 0.90$) and standardized ($M = 0$, $SD = 1$) to ease interpretation of regression results.

Teachers reported the total number of children in their classroom, as well as the number who were designated English language learners (ELLs), who had behavior problems, and who had learning or physical disabilities; we calculated percentages based on these numbers. Teachers also reported the number of teaching staff in their classroom, which we used to calculate the child:teacher ratio.

7.3. Missing data

A small number of parents were missing information on predictors of depression and food insecurity during COVID-19 (missingness across variables ranged from 1% to 9%). Similarly, a small number of teachers were missing information on predictors (missingness across variables ranged from 1% to 14%). Multiple imputation was conducted separately for parents and teachers using the ICE command in Stata v16 (StataCorp, 2019). Estimates from regression models were combined across 25 multiply imputed data sets separately for parents and teachers using the MIM command in Stata.

7.4. Analytic plan

Our analytic plan proceeded in two steps. First, we assessed the prevalence of depression and food insecurity among teachers and parents, both before and during the COVID-19 pandemic. Second, we regressed parents' and teachers' depression and food insecurity during COVID-19 on pre-COVID-19 characteristics. Separate logistic regression models were run for depression and food insecurity for both parents and teachers. For parents, pre-COVID-19 predictors included depression, food insecurity, marital status, education level, income, primary language, household size, race/ethnicity, age at child's birth, whether child had disability, and household chaos. For teachers, pre-COVID-19 predictors included depression, food insecurity, marital status, race/ethnicity, number of children at home, executive function, job satisfaction, school climate, class size, percent of class who were ELLs, percent of class who had behavior problems, and child:teacher ratio.

8. Results

8.1. Prevalence of depression and food insecurity before and during the COVID-19 pandemic

Among parents, the prevalence of both depression and food insecurity increased during the COVID-19 pandemic (Fig. 1). Before COVID-19, 17% of parents were depressed, compared to 25% during COVID-19. Before COVID-19, 36% of parents were food-insecure, compared to 45% during COVID-19. Among teachers, the prevalence of depression increased but the prevalence of food insecurity
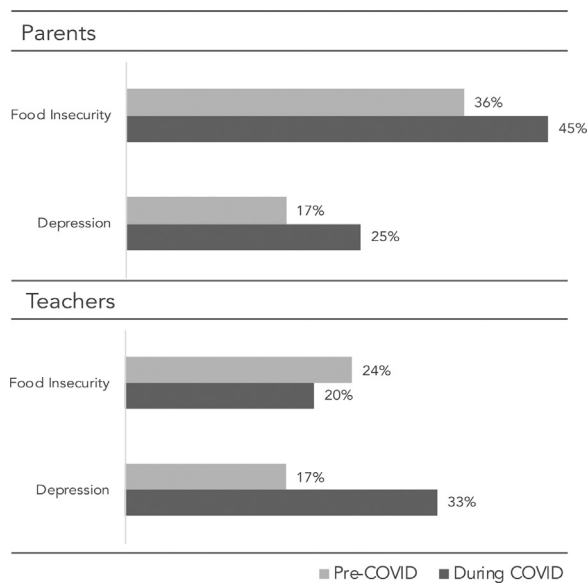
Fig. 1. Prevalence of depression and food insecurity among parents and teachers.

Table 2
Pre-COVID-19 predictors of parents' and teachers' depression and food insecurity during the COVID-19 pandemic.

	Depression		Food Insecurity	
	OR	SE	OR	SE
Parents				
Pre-COVID-19 depression	2.40**	0.77	1.73	0.56
Pre-COVID-19 food insecurity	1.55	0.41	2.64***	0.66
Black	1.04	0.38	1.79	0.60
Hispanic/Latinx	2.01	0.81	2.49*	0.90
Other race/ethnicity	0.86	0.39	2.11*	0.80
Unmarried	1.17	0.34	1.48	0.39
Child has documented disability	1.32	0.54	0.60	0.24
Mother's age at child's birth	0.98	0.02	1.00	0.02
Education HS or less	0.64	0.19	1.88*	0.50
Primary HH language Spanish only	0.89	0.37	1.94	0.73
HH size	0.94	0.08	1.06	0.08
Log(HH income)	0.99	0.07	1.04	0.07
HH chaos[a]	1.30*	0.17	0.99	0.12
n	386		386	
Teachers				
Pre-COVID-19 depression	6.51***	4.02	0.73	0.63
Pre-COVID-19 food insecurity	0.91	0.62	22.21***	19.07
White	0.87	0.54	1.23	0.92
Unmarried	0.66	0.43	1.03	0.84
Number of children at home	0.99	0.20	1.61	0.45
Log(HH income)	0.58	0.52	0.41	0.52
Executive function[a]	0.45**	0.14	0.85	0.31
Job satisfaction[a]	0.54	0.19	2.74	1.51
Positive school climate[a]	1.39	0.53	0.38*	0.17
% students who were ELLs	1.01	0.01	1.00	0.02
% students who had behavior problems	0.98	0.02	1.02	0.03
% students with disability	1.02	0.04	1.03	0.05
Child:teacher ratio	1.04	0.05	0.99	0.07
n	104		104	

Notes. OR = odds ratio; SE = standard error; HS = high school; HH = household; ELL = English language learner. Household income dropped from teacher models due to multicollinearity.
[a] Variable is standardized.
* $P < .05$
** $P < .01$
*** $P < .001$.

did not. Before COVID-19, 17% of teachers were depressed (notably, the same proportion as parents). During COVID-19, 33% of teachers were depressed (a slightly higher proportion than among parents). Before COVID-19, 24% of teachers were food-insecure, whereas during COVID-19, this rate was 20%.

8.2. Predictors of depression and food insecurity during the COVID-19 pandemic

8.2.1. Parents

Regression models showed that parents who were depressed before COVID-19 had over twice the odds of being depressed during COVID-19 relative to other parents, controlling for all other predictors (OR = 2.40, SE = 0.77, $P < 0.01$; Table 2). Additionally, parents with more household chaos before COVID-19 were more likely to be depressed during COVID-19. Specifically, a 1-SD increase in chaos was associated with 1.30 greater odds of being depressed during the COVID-19 pandemic (SE = 0.17, $P < 0.05$).

Parents' marital status, race/ethnicity, primary language, education, age at child's birth, household size, and income were all unassociated with the odds of being depressed during COVID-19, as was whether the child had a documented disability. Parents' pre-COVID-19 food insecurity status was also unrelated to whether they were depressed during the pandemic.

Parents' pre-COVID-19 food insecurity status was, however, strongly related to whether they were food-insecure during COVID-19. Parents who were food-insecure before COVID-19 had 2.64 greater odds of being food-insecure during COVID-19 than other parents (SE = 0.66, $P < 0.001$), controlling for all other predictors. Parents who were Hispanic/Latinx had 2.49 greater odds of being food-insecure than White parents during COVID-19 (SE = 0.90, $P < 0.05$), and those who were in the other race/ethnicity group had 2.11 greater odds of food insecurity during COVID-19 than White parents (SE = 0.80, $P < 0.05$). Parents with a high-school education or less had 1.88 greater odds of food insecurity during COVID-19 relative to more educated parents (SE = 0.50, $P < 0.05$).

Parents' marital status, age at child's birth, primary language, household size, household income, and household chaos before COVID-19 did not predict their food insecurity during COVID. Neither did the child's disability status. Also, parents' depression sta-

tus before COVID-19 was not associated with their food insecurity status during COVID-19.

8.2.2. Teachers

Teachers who were depressed before COVID-19 had over 6 times the odds of depression during COVID-19 relative to other teachers (OR = 6.51, SE = 4.02, $P < 0.001$), controlling for all other predictors. Teachers with higher executive function scores before COVID-19 had lower odds of depression during COVID-19. A 1-SD increment in executive function approximately halved the odds of depression during COVID-19 (OR = 0.45, SE = 0.14, $P < 0.01$). Teachers' race/ethnicity, marital status, number of children, and household income were all unassociated with depression status during COVID-19. Both teacher job satisfaction and positive school climate ratings were also unassociated with depression during COVID-19. The composition of the classroom (percent of students who were ELLs, had behavior problems, or had disabilities, and the child: teacher ratio) was consistently unassociated with the odds of depression during COVID-19. Finally, teachers' food insecurity status before COVID-19 was not associated with their depression status during COVID-19.

Teachers' food insecurity before COVID-19, was, as with parents, strongly associated with their food insecurity during the COVID-19 pandemic. Teachers who were food-insecure before COVID-19 had over 20 times the odds of other teachers of being food-insecure during COVID-19 (OR = 22.21, SE = 19.07, $P < 0.001$). Teachers' food insecurity during COVID-19 was not associated with their

demographic characteristics or with features of their classroom's composition before COVID-19. However, teachers who reported a more positive school climate before COVID-19 had lower odds of being food-insecure during COVID-19. Specifically, a 1-SD increment in school climate was associated with an approximately two thirds reduction in the odds of food insecurity during COVID-19 (OR = 0.38, SE = 0.17, $P < 0.05$). Yet neither teachers' job satisfaction nor executive function before COVID-19 predicted their odds of food insecurity during COVID-19. As with parents, teachers' depression status before COVID-19 was not associated with their food insecurity status during COVID-19.

9. Discussion

COVID-19 has dramatically altered children's lives, triggering massive shifts in home and school routines. Home became – and for some, remains – the context for school, creating added stress for parents alongside other pandemic-induced burdens such as job and income loss. Meanwhile, teachers, many of whom are themselves parents, shifted to an entirely new instructional mode while trying to survive the pandemic. These parallel threats to parents' and teachers' wellbeing potentially affect young children on "both sides" of the remote learning screen, as implied by voluminous research linking caregiver mental and economic strain to child developmental outcomes (Johnson & Markowitz, 2018a, 2018b; Lovejoy et al., 2000; Wachs et al., 2009; Whitaker et al., 2015; Yeung et al., 2002).

Given the possibility that distance learning will resume so long as COVID-19 remains a threat, it is important to understand which parents and teachers are most vulnerable to declines in mental and economic wellbeing so that school and community supports can be targeted where need is greatest. We took on this challenge, relying on pre-COVID-19 data to predict during-COVID-19 caregiver mental and financial hardships. In so doing, we point to areas of greatest risk – and potential improvement – for parents and for teachers, and thus, for children.

9.1. Prevalence of mental and financial hardships before and during COVID-19

Our results suggest that even before COVID-19 struck, the low-income parents in our sample – as well as their children's teachers – experienced mental and financial hardship. Almost one-fifth of parents reported depressive symptoms before COVID-19, a rate falling in the range reported by parents with low incomes with young children in the general population (Johnson & Padilla, 2019; Manuel, Martinson, Bledsoe-Mansori, & Bellamy, 2012; McDaniel et al., 2013). Strikingly, teachers reported depression at the same rate. In fact, the proportion of teachers in our sample who were depressed before COVID-19 (17%) was identical to that found in a sample of early childhood educators in Virginia before the pandemic (Markowitz, Cubides-Mateus, & Bassok, 2021). Both sets of caregivers also experienced food insecurity before COVID-19, with parents reporting higher rates than teachers (one-third vs one-fourth).

Alarmingly, yet consistent with national data tracking COVID-19 impacts, teachers and parents in our sample reported increased depressive symptoms during COVID-19. The rate of depressive symptoms among parents increased from 17% to 25%, whereas the rate among teachers nearly doubled, from 17% to 33%. We had hypothesized that teachers who themselves had children learning at home would be most distressed, but found no association between number of children and teacher depression during COVID-19.

Parent-reported food insecurity also increased during COVID-19, jumping from one-third to nearly one-half, while teacher-reported food insecurity stayed relatively constant. These divergent patterns across parents and teachers could be because teachers remained fully employed with benefits during the pandemic, whereas many parents experienced job and income loss. In addition, teachers' connections to school administrators and staff, including those managing school lunch and other food distribution, could have provided avenues toward food supports, offsetting food insecurity for teachers.

9.2. Predictors of mental and financial hardships during the COVID-19 pandemic

Across both sets of caregivers – parents and teachers – the strongest predictors of hardships during COVID-19 were their status on those hardships before COVID-19. That is, pre-COVID-19 depression predicted during-COVID-19 depression, and pre-COVID-19 food insecurity predicted during-COVID-19 food insecurity, net of other stressors, contextual, and demographic control variables. Our finding that pre-COVID-19 depression predicted during-COVID-19 depression is consistent with past evidence from Iowa flooding (Ginexi et al., 2000), Hurricane Katrina (Rhodes et al., 2010), and Hurricane Sandy (Hausman et al., 2020). Similarly, the association we found between pre- and during-COVID-19 food insecurity is consistent with evidence that predisaster income predicts material hardship during disasters, but this is first study (to our knowledge) linking predisaster food insecurity to during-disaster food insecurity, in particular. Interestingly, pre-COVD-19 depression never predicted food insecurity, nor did pre-COVID-19 food insecurity predict depression, for either set of respondents. This is notable as a growing body of research has identified both concurrent and reciprocal longitudinal links between depression and food insecurity (Bhargava et al., 2008), albeit during normal, nonpandemic times. Results from emerging studies of COVID-19 impacts on families and educators, many of which are assessing depression and food insecurity, will help illuminate whether the two phenomena are unrelated during a pandemic, whether a longer follow-up window is needed to detect causal relations, or whether this finding is unique to our data.

9.2.1. Predictors of parent and teacher depression during COVID-19

The only other significant predictors of depression during the pandemic besides prior depression were 2 phenomena related to caregiver planning and organizational capacities: household chaos for parents, and executive functioning for teachers. Prior studies have linked household chaos to parental depression (Hur et al., 2015; Pike et al., 2006). It may be that disorganized, noisy, and crowded homes contribute to depressed mood, but also, or alternatively, depressed parents may struggle to organize and manage home life. In most prior studies, chaos and depression have been measured simultaneously while in the current study, our measure of chaos preceded our measure of depression. We hypothesize that household chaos may tap parents' underlying executive functioning skills. Parents who struggle to keep an orderly, routine-driven home may have challenges more broadly with planning, organization, and working memory – all pillars of executive functioning (Miyaki et al., 2000). Unfortunately, we lack a measure of parent executive functioning in our study; future research should certainly seek to include it. Further research is also needed to explicitly test the possibility that depression leads to chaos even if chaos also leads to depression.

For teachers, better executive functioning predicted a significantly lower risk of depression. Following the above, it stands to reason that those teachers with more capacity for planning, organization, and routinization would be better equipped to respond to the shock of COVID-19. Indeed, we had hypothesized that teachers with higher executive function may have been better at adapt-

ing to the abrupt transition to remote learning during COVID-19 if they were more organized and time-efficient, quicker to establish new routines, better at multitasking, and more creative while trouble-shooting novel problems. Such skills are likely to make teachers less susceptible to burnout due to feeling out of control and unable to meet demands; indeed, a survey of teachers in the fall of 2020 found that teachers who were teaching remotely were more likely than those teaching in person to report concerns surrounding burnout (Kaufman & Diliberti, 2021). Fully 42% of teachers surveyed felt that the stress and disappointments associated with their work were not worth it, compared to 28% before the pandemic (Kaufman & Diliberti, 2021). To the extent that teachers with better executive function were better able to adapt to remote learning, they may have experienced less distress during the pandemic. On the other hand, it should be acknowledged that teachers could have scored higher on our measure of executive function – that is, reported fewer difficulties concentrating on and completing tasks – if they faced fewer disruptions and competing demands on their time and attention in their home environments while teaching remotely. It would be useful to replicate our finding with an objective measure of teachers' executive function rather than a self-reported measure which could reflect not only executive function skills but daily strains on those skills.

Despite anecdotal reports of hardships transitioning from in-person to online learning for parents and teachers of children with disabilities (Grose, 2021), we found no evidence that for parents, having a child with special needs, or for teachers, having a high proportion of students with special needs, predicted depression. It could be that the hassles and frustrations that arise while caring for and educating students with special needs result less commonly in depression and more commonly in stress, which we did not measure.

9.2.2. Predictors of parent and teacher food insecurity during COVID-19

For parents, the only significant predictors of food insecurity during COVID-19 beyond prior food insecurity were known correlates of disadvantage: minority race/ethnicity and low education level. Specifically, Hispanic/Latinx parents and those who were multiracial, Native American, or Asian/Pacific Islander were more likely to report food insecurity than were White parents, just as mothers with a high school degree or less were more likely to be food-insecure than were more educated mothers. Parents with less formal education may be at greater risk for food insecurity because they have smaller social networks, or because their networks include fewer individuals with knowledge and resources conferring opportunities for food supports (e.g., a friend with a car who could drive to a food pantry; Ajrouch, Blandon, & Antonucci, 2005; Dominguez & Watkins, 2003; Sano, Garasky, Greder, Cook, & Browder, 2011).

It is well-documented that Hispanic/Latinx families are at greater risk for food insecurity than other households, in general and especially during the COVID-19 pandemic (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2020; Karpman et al., 2020; Morales, Morales, & Beltran, 2021). This could be due in part to the fact that some Hispanic/Latinx adults are immigrants, and may lack the documentation required for some government-sponsored food assistance programs and/or fear legal reprisals for applying for services. Although our study did not collect information on immigrant/documentation status, 62% of Hispanic/Latinx children ages 5-9 in the Tulsa metro area have at least one immigrant parent (American Community Survey, 2019). Another study using the Tulsa SEED Study data found that after COVID-19 broke out, families of Hispanic/Latinx English language learners were less likely than others to take up food stamps (SNAP), for which eligibility

is conditioned on native-born status, but equally likely to take up other food benefits for which nativity status is irrelevant (Partika, Johnson, Martin, Castle, & Tulsa SEED Study Team, 2021). Interestingly, greater loss of income due to the pandemic did not explain the spike in food insecurity in Hispanic/Latinx families relative to others. Certainly, more research is needed on what places Hispanic/Latinx families at heightened risk of food insecurity within an already low-income population. Attention must be paid to both the characteristics of the families themselves as well as those of their communities (e.g., public transportation, proximity to supermarkets; Bartfeld & Wang, 2006).

For teachers, the only other significant predictor of food insecurity beyond prior food insecurity was positive school climate. Unlike parents, teachers are guaranteed access to a professional network made up of other teachers and school staff. We hypothesized earlier that the relative stability in teacher food insecurity from before COVID-19 to during COVID-19 may have been due in part to their access to this network. The measure of school climate included questions tapping cooperation among school staff and the administration's support for school staff. Perhaps teachers who reported more positive school climates were more connected with schedules and locations for distribution of school lunches and grab-and-go bags; additionally or alternatively, they may have drawn on this social network to learn about and avail themselves of opportunities to receive food assistance outside the school environment.

9.3. Limitations

This study is among the first to explore the prevalence and predictors of mental and financial hardships experienced by caregivers on both sides of the distance learning screen during an ongoing global pandemic that likely won't abate for some time. Despite its contributions, however, there are some limitations that should be acknowledged.

The first major limitation of the current study is that there was some overlap between the end of the window when the annual Teacher Survey was fielded and the beginning of the window when the Teacher COVID-19 Survey was fielded. Despite not having completely finished the annual Survey, it was important to field the COVID-19 Survey as soon as possible so data collection could conclude before the school year ended. This could have caused some teachers' "pre-COVID-19" data to reflect their circumstances during COVID-19, which would have inflated associations between predictors and outcomes. To test this possibility, we re-ran teacher models excluding any teachers who responded after school closures, and results did not substantively change.

Another limitation is our inability to test for the representativeness of the teachers who responded to our survey. It is unknown how closely our respondents resembled all first-grade teachers in Tulsa, much less teachers in other grades. The families in our sample may also not have perfectly represented all families in Tulsa. For example, 9% of children in our sample had a disability, compared to 16% in Tulsa Public Schools overall (tulsaschools.org/about). The racial/ethnic distribution seems to have been comparable, though. Thirty-eight percent of parents in our study were Hispanic/Latinx, compared to 37% of children in Tulsa at large; 20% of parents in our study were Black, compared to 23% in Tulsa; and 30% were White, compared to 23% in Tulsa (tulsaschools.org/about).

We were also unable to construct strictly comparable models for parents and teachers. For example, it would have been useful to have measured executive functioning in parents as well as teachers, and to have measured chaos in classrooms as we did in households – or, for that matter, to be able to identify which, if any, of the parents were themselves teachers. It will also be crit-

ical for future researchers to examine precisely how parents' and teachers' depression and food insecurity during distance learning impacted children's learning and mental health, particularly when both caregivers were affected for a given child.

We also note that this study was conducted shortly after the onset of the pandemic. It captures parents and teachers' experiences of abrupt and unplanned distance learning in the spring of 2020. At that time, parents and teachers had had little chance to adapt to new routines and resources. It is thus unknown how generalizable these findings are to distance learning occurring since then. By fall 2020, many school districts across the United States remained in distance-learning but had time during the summer to plan a remote curriculum and/or provide technical assistance to parents and teachers. Still other school districts opened the 2020-2021 school year with in-person instruction and switched abruptly to remote instruction over the fall due to rising rates of COVID-19. Many food distribution systems and parent peer support networks developed and expanded over the course of the year. While there is still a great deal of COVID-19-imposed distance learning occurring as of the winter of 2021, families' circumstances may have changed a great deal since the beginning of the outbreak – for better, as some jobs were restored, or for worse, as more people contracted COVID-19. Clearly, children from low-income families remain in peril, and their parents and teachers deserve supports for both their mental and financial wellbeing.

9.4. Conclusion

This study joins with emerging research on the impacts of COVID-19 on the key adults in children's ecosystems – parents and teachers – to document the prevalence of known hardships, as well as potential avenues for protection. Findings supports the contention, made by several observers, that the pandemic has not affected all residents of the United States equally, but has rather exacerbated existing disadvantages by disproportionately hurting already vulnerable subgroups (Benner & Mistry, 2020; Gunnar, 2021;Lauren et al., 2021). For example, unemployment due to COVID-19 has been greatest in the lowest-paying industries (Center on Budget and Policy Priorities, 2021), and therefore demographic subgroups concentrated in these industries, such as Hispanic/Latinx women and immigrants, have been inordinately hit (Kochhar, 2020). We find that parents and teachers who had already experienced depression and food insecurity before COVID-19 were at heightened risk for depression and food insecurity, respectively, during COVID-19. This is yet another example of the way COVID-19 has magnified vulnerabilities that predated the pandemic.

Our results point to several possible areas for intervention. Although, as of the fall of 2021, most school districts had reinstated in-person instruction, some still offer distance learning or may have to return to that mode if the pandemic so necessitates (Diliberti & Schwartz, 2021).

Remote learning offers an accessible and low-cost platform for connecting parents with food and mental health supports. For instance, periodic wellness check-ins (available in Spanish as well as English) could be built into children's online learning schedules. During these sessions, a school nurse, social worker, or parent ambassador could assess household wellbeing, provide household organization tips, suggest nearby food distribution sites, and connect parents with each other via online affinity groups.

Schools could also better support teachers by providing training and materials specific to online instruction. National surveys reveal that teachers want help with keeping students engaged and motivated, assessing student learning, and adapting their curriculum for an online context (Kaufman & Diliberti, 2021). These are just some possibilities through which school districts and community groups could deliver relatively low-cost supports to offset depression and food insecurity, and hence promote optimal child wellbeing, on both sides of the screen.

Declaration of interest

None.

Author Contributions

Anne Martin: Conceptualization, Methodology, Data Analysis, Writing. **Anne Partika:** Data Analysis, Editing and Review of Writing. **Sherri Castle:** Conceptualization, Editing and Review of Writing, Data Collection, Project Administration. **Diane Horm:** Conceptualization, Editing and Review of Writing, Data Collection, Project Administration. **Anna D. Johnson:** Conceptualization, Data Analysis, Writing, Data Collection, Project Administration. **Tulsa SEED Study Team:** Data Collection, Project Administration.

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