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Understanding family life during the COVID-19 shutdown

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Abstract

Objective: Our study investigates how changes in family contexts were associated with child behaviors during Ohio's COVID-19 shutdown of early 2020.

Background: The COVID-19 pandemic caused major economic and social changes for families. Rapid research was conducted to assess these changes and their potential impacts on child behaviors.

Method: Using a diverse sample of families with children aged birth to 9 years ($N = 559$), we describe key economic changes and parent-reported stressors experienced during Ohio's shutdown period. Then, we use regression models to examine how these family conditions were associated with child emotional distress and changes in sleep routines.

Results: When parents experienced more total COVID-19 pandemic-related stressors, they also reported that their children exhibited more anxious and withdrawn, fearful, acting out, and COVID-19 pandemic-related behaviors ($p < 0.01$).

Conclusion: Families and children living at home in Ohio experienced significant stress during the shutdown. These findings can be used to inform future studies of the social and economic consequences of the COVID-19 pandemic for parents and children.

Implications: Families and children have experienced multiple stressors during the COVID-19 pandemic. Researchers and practitioners should continue to monitor and support families and children to mitigate potential lasting consequences.

KEYWORDS

child emotional distress, COVID-19 pandemic, economic stress, family stress model, mental stress, parent-child well-being

As the global COVID-19 pandemic developed during Spring 2020, the rapid spread of SARS-CoV-2 and related deaths led to government-mandated stay-at-home orders, business and school closures, and social-distancing practices in many parts of the world (de Bruin et al., 2020; Douglas et al., 2020). These sweeping economic and social changes were implemented with little notice, leaving families to cope with unanticipated upheavals in their home and work environments. This sudden change in work and school accessibility changed the amount of time families were spending together and the responsibilities parents managed. The school and home environments merged through virtual learning platforms. These changes potentially altered parenting practices experienced by both school-age children, who were suddenly at home full-time, and non-school-age children, who also felt the effects of changes in family routines and structures. Although researchers and policymakers were tracking the epidemiological patterns of the pandemic, fewer resources were allocated to examine how families were coping with the economic and social changes occurring as a consequence of the COVID-19 pandemic.

In this article, we provide insight into understanding these changing conditions in families with children living at home in Ohio during the stay-at-home order and school closure period (a.k.a., the shutdown) via the COVID & Families Study (CFS). Through the CFS, we sought to capture detailed information about children's microsystem experiences and family activities, as well as exosystem experiences related to parental work and related economic changes during the shutdown period. We focused on families with children aged birth to 9 years and assessed multiple aspects of children's well-being during this time. During early childhood, common behavior problems linked to emotional distress include internalizing behaviors such as anxiety, withdrawal, and fearfulness, as well as externalizing behaviors such as acting out (e.g., Eisenberg et al., 2003). Additionally, changes to child sleep patterns can be linked to these behavioral problems (Gregory & Sadeh, 2012). Problem behaviors expressed in early and middle childhood can be predictive of later behaviors in early adolescence (Bornstein et al., 2010), suggesting that these behaviors may have long term consequences for social-emotional functioning. Here, we focus on documenting economic changes and parent-reported stressors, and their potential links with children's emotional distress behaviors among families with children aged birth to 9 years of age in urban areas of central Ohio during March–June 2020.

FAMILY CONTEXTS AND CHILD WELL-BEING

The family system is critical to early child development because this is the context in which children experience their earliest interactions. Even as children approach school-age, interactions with family members constitute critical proximal processes that shape children's learning and social development. However, the family context does not operate in a bubble, and interactions within the home are influenced by macro-forces outside the home, such as the availability of parental employment (e.g., Grzywacz & Marks, 2002). Given the myriad societal and economic changes induced by the pandemic, we draw on a bioecological systems framework to identify exosystem factors (i.e., family economic well-being: change to monthly income, change to employment, and new use of assistance programs), microsystem factors (i.e., parent COVID-19 pandemic-related stress), and individual level functioning (Bronfenbrenner & Morris, 1998). The process–person–context–time (PPCT) elaboration of the bioecological model is particularly useful because it emphasizes the importance of historical time and events for children's bioecological systems and related development (Bronfenbrenner & Morris, 2006; Rosa & Tudge, 2013). During the COVID-19 pandemic, interactions among family members became a large proportion of children's proximal experiences as schools and childcare centers were closed and many parents began working from home. Additionally, the pandemic changed the nature of interactions within this context, as exosystem factors, such as job loss, may have led to an

increased amount of stress experienced across the family (e.g., Calvano et al., 2021; Fong & Iarocci, 2020; Lawson et al., 2020). In this study, we hypothesized that exposure to COVID-19 pandemic-related stressors that arose rapidly may have placed strain on the family system and on children's well-being, above and beyond what they were previously experiencing from stress experienced due to day-to-day life struggles.

We also drew on the family stress model, which is undergirded in the bioecological model, and provides a more focused lens through which to examine how economic stressors shape family processes and child development (McCurdy et al., 2010). Specifically, we used the family stress model to conceptualize how pandemic-induced stressors at the family level may be associated with children's development (e.g., Conger et al., 2000; Gershoff et al., 2007; Masarik & Conger, 2017). Family stress models have documented the impacts of exosystem-level factors (e.g., economic hardship) on microsystem-level factors such as parental mental health and parenting behaviors (e.g., harsh parenting) and, ultimately, on child socioemotional development (e.g., Conger et al., 1994, 2002; McLoyd, 1990). Related empirical evidence shows that under nonpandemic conditions, children with distressed caregivers and children from economically disadvantaged homes show more behavioral problems, lower levels of well-being, and more sleep problems (e.g., Ackerman et al., 1999; Aktar et al., 2017; Deater-Deckard, 1998; Downey & Coyne, 1990; Dubois-Comtois et al., 2019; El-Sheikh & Kelly, 2017; Liu & Merritt, 2018). However, pandemic-related social distancing created additional social and health distress for families. Thus, whereas traditional family stress and child development research focus on economic hardship as a driver of parental distress and risks to child well-being, pandemic conditions provide a unique context when social and health stressors may play equally important roles.

PANDEMICS AND PARENT-CHILD WELL-BEING

In recent decades, families around the globe have been subject to pandemic conditions and related mitigation efforts (e.g., social isolation and quarantining) during the severe acute respiratory syndrome (SARS) pandemic of 2003–2004 (e.g., Svoboda et al., 2004; Weinstein, 2004) and the influenza A H1N1 pandemic of 2009–2010 (e.g., Fineberg, 2014; Hashim et al., 2012). Most studies that arose after these two pandemics focused on compliance with mitigation measures (e.g., Blendon et al., 2006; SteelFisher et al., 2012) or the relationship between pandemic-related stress and worsening adult mental health (e.g., Main et al., 2011; Pfefferbaum et al., 2013; Tzeng et al., 2020). Although little research is available on family contexts, previous findings suggest that between one quarter and one third of adults who experienced quarantining or social isolation reported symptoms of posttraumatic stress disorder (PTSD) and depression (Hawryluck et al., 2004; Sprang & Silman, 2013). Further, parent reports revealed that 30% of children who were isolated or quarantined during the H1N1 pandemic also met the criteria for PTSD (Sprang & Silman, 2013).

The COVID-19 pandemic is likely to have similar negative implications for parents and children due to the concomitant economic and social upheavals that accompanied the global health crisis. In early 2020, as the COVID-19 pandemic spread through the United States and shutdowns began in many states (Douglas et al., 2020; Haffajee & Mello, 2020), a number of factors coalesced to potentially impact families. Notably, in April 2020, job losses were widespread, and the federal unemployment rate climbed to 14.7%, reducing the income of many families (Bureau of Labor Statistics, 2020). The shutdown changed family life in other ways, with the onset of social distancing and quarantining and the transition of work, schooling, and childcare activities into the home. The impact of these changes was evident in the short term.

Research studies conducted during Spring and early Summer 2020 found that many U.S. parents of children from birth to 18 years of age reported worsening well-being since

March 2020 for both themselves and their children ($N = 286$ parents, Davidson et al., 2020; $N = 645$ parents, Gassman-Pines et al., 2020; $N = 1011$ parents, Patrick et al., 2020). For parents who were working in hourly service industry positions before the pandemic, pandemic-related hardships, such as income and job loss, exaggerated these negative effects ($N = 645$, Gassman-Pines et al., 2020). Further, parent experiences of stress during the COVID-19 pandemic have been shown to influence parenting behaviors and activities (Brown et al., 2020; Lee et al., 2021). This suggests important effects of pandemic-related social and economic impacts on children's family and home environments, particularly during stay-at-home and shutdown periods.

CURRENT STUDY

We designed and implemented the CFS in Ohio during the pandemic's early stages. Ohio's statewide stay-at-home and school closures orders were implemented in mid-March 2020 (Camera, 2020; Office of Governor DeWine, 2020a). This led to the closing of childcare centers and weeks of cancelled schooling, followed by remote teaching for the remainder of the academic year (Office of Governor DeWine, 2020b, 2020c, 2020e). Ohio's stay-at-home order was ultimately extended through May 1 (Office of Governor DeWine, 2020d), then downgraded to the "Stay Safe Ohio Order," which asked Ohioans to continue to limit time spent out of the home while reopening began (Office of Governor DeWine, 2020f). Although some childcare centers reopened May 31 with new restrictions (Office of Governor DeWine, 2020g), schools remained closed through Summer 2020.

In this article, we focus on parental work and household economic changes and parents' experiences with COVID-19 pandemic-related stressors as important aspects of children's family contexts. We hypothesize that negative economic changes (job loss, declines in income, and new use of assistance programs) and the number and difficulty of stressors faced by parents will be associated with children's emotional distress behaviors. The results provide an initial view of the potential implications of pandemic economic and social conditions for families with children aged birth to 9 years living at home.

METHODS

To investigate the effects of Ohio's stay-at-home order on families with children, we developed and administered an electronic survey to primary caregivers of children aged birth to 9 years (or those in early and middle childhood), who were currently participating in three research projects in Columbus and Cleveland, Ohio (see Supplemental Material 1 for participants' geographic distribution). The survey design and distribution methods (i.e., emailed Qualtrics survey links) were approved by the authors' institutional review board (IRB) via amendments to the existing IRB protocols for each of the three research projects. Data were collected between May 7 and June 20, 2020. On average, respondents completed the survey 64.7 days after March 15, 2020. Upon clicking the survey link, parents were asked to read and sign a consent form and were informed that they would receive a \$15 electronic gift card upon completing the 20- to 25-minute survey.

Study Participants

As of March 2020, when Ohio schools shut down, more than 1000 children and families were enrolled in one of three ongoing studies: SMALL Talk: A Study of Milestones to Advance Language Learning (SMALL Talk), Kindergarten Transition Practices (KTP), and Early

Learning Ohio (ELO). SMALL Talk is a National Institutes of Health–funded birth cohort longitudinal study of low-income mothers with infants (6–11 months of age). The goal of the 5-year study is to explore the interplay of parent–child interaction quality and parent stress on children’s language trajectories to age 5 years, which began in October 2019. Participants were recruited in Columbus, Ohio, through Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) centers and community-based sampling techniques. As of March, 20 mothers of infants aged 6 to 11 months were enrolled in SMALL Talk, and more than 175 mothers of infants aged 0 to 15 months had joined the project’s referral contact list.

ELO is a longitudinal study of children from preschool through third grade in a large geographically and socioeconomically diverse school district that focuses on how variations in classroom ecology shape academic and social development over time. A total of 801 children were enrolled in ELO during preschool or kindergarten, and in March, 652 children aged 7 to 9 years were still active in the sample, with 12 currently in first grade and 640 in second grade.

KTP is a two-cohort randomized controlled trial testing a suite of educational practices implemented in low-income-serving preschool settings for their effects on children’s transition to kindergarten and through first grade. Across two sequential cohorts of preschool-age children, a total of 628 children were enrolled in KTP. In March, 549 children aged 4 to 6 years were still active in the sample, with 220 currently in prekindergarten and 324 in kindergarten.

The CFS survey was sent to the primary caregivers of 41 SMALL Talk, 319 ELO, and 527 KTP families who were currently enrolled in these studies and had previously provided an email address. As SMALL Talk had only recently begun recruitment, we also leveraged our referral contact list to reach out to an additional 175 families. The final sample of respondents included 559 participants—255 from ELO (79.7% response rate), 210 from KTP (39.8% response rate), 36 from SMALL Talk (87.8%), and 58 from the referral list (33.1% response rate). As shown in Table 1, about 92% of participating primary caregivers identified as the focal child’s mother and 3.6% identified as the focal child’s father, and therefore hereafter we refer to these primary caregivers as *parents*. Most parents ranged in age from 18 to 65 years old, with an average age of 34.6 years. The average age for target children was 6.0 ± 2.6 years, and 43.6% were female. Most parents had at least attended some college or obtained some kind of post-secondary degree (72.6%). Most parents were either married (53.8%) or living with a partner (14.7%). Parents primarily identified as either White (66%) or Black/African American (25%). Our sample was socioeconomically diverse, with 37% of parents reporting their 2019 income as less than \$30,000, about 37% between \$30,000 and \$90,000, and about 26% at \$90,000 or higher.

Measures

The full-length CFS survey included about 250 questions, approximately one third of which were yes–no questions that participants could answer quickly and took about 20 to 35 minutes of time to complete (full survey available upon request). Here, we focus on describing selected constructs used within the present study, including variables related to (a) target child behaviors linked to emotional distress, (b) family economic well-being and parent COVID-19 pandemic-related stress, and (c) sociodemographic characteristics.

Outcome variables: Target child behaviors linked to emotional distress

Child’s behavior problems

We asked parents to respond to 21 statements related to their target child’s behaviors linked to emotional distress over the past month using the four subscales of the Pediatric Emotional

TABLE 1 Descriptives for demographic variables

Demographic characteristics	<i>n</i> reporting	Frequency	<i>M</i>	<i>SD</i>	Min	Max
Respondent's relationship to focal child	559					
Mother		91.9%				
Father		3.6%				
Stepparent, foster parent, grandparent or other		4.5%				
Parent age	544		34.6	7.5	18	65
Target child's age (in months)	534		72.4	31.7	1	118
Target child's sex (% = female)	534	43.6%				
Parent highest level of education	554					
Never graduated high school		5.6%				
High school diploma or GED		21.8%				
Some college		39.5%				
Bachelor's degree		20.6%				
Master's degree or higher		12.5%				
Parent marital status	550					
Married		53.8%				
Living with partner		14.7%				
Single		31.5%				
Parent race	548					
White		68.6%				
Black/African American		24.5%				
Other		6.9%				
2019 annual household income	505					
Less than \$30,000		37.0%				
\$30,000–\$59,999		21.4%				
\$60,000–\$89,999		16.0%				
\$90,000 or more		25.5%				

Note: *This subscale only asked if target children was aged under 3 years.

Distress Scale (PEDS; Saylor, 2002; Saylor et al., 1999). Parents were asked to rate how often their child exhibited each behavior, selecting from *almost never*, *sometimes*, *often*, or *very often* (scored from 0 to 3). For each subscale, a sum score was calculated for participants who responded to at least 75% of the items for that subscale. In each case, a higher subscale summed score indicated higher levels of that category of child's behavior problems.

The Anxious and Withdrawn Behaviors subscale included six items that assessed behaviors such as seeming worried and crying without reason, and had high internal consistency in our sample ($\alpha = 0.73$). Most parents (90.5%) completed more than 80% of items (i.e., five or more) for this subscale; 32 (5.7%) did not complete any of these items. The Fearful Behaviors subscale included five items that assessed behaviors such as seeming fearful without reason and being clingy or refusing to be alone, and had high internal consistency in our sample ($\alpha = 0.72$). As with the first subscale, most parents (92.3%) completed at least 80% of items (i.e., four or more) for this subscale; 30 (5.4%) did not complete any of these items. The Acting Out Behaviors subscale included six items that assessed behaviors such as acting whiny or demanding, and had high internal consistency within our sample ($\alpha = 0.84$). Again, most parents (92.4%) completed greater than 80% of items (i.e., five or more) for this subscale; 31 (5.5%) did not complete any

of these items. The COVID-19 Pandemic-Related Behaviors subscale (modified from the PEDS Trauma Impact subscale) was only administered to children older than 3 years and included the following four statements: “create games, stories, or pictures about the COVID-19 pandemic,” “brings up the COVID-19 pandemic in conversation,” “avoids talking about the COVID-19 pandemic even when asked,” and “seems fearful of things that are reminders of the COVID-19 pandemic.” This subscale had acceptable internal consistency within our sample ($\alpha = 0.59$). This subscale had the most missing data: 434 parents (77.6%) completed at least 75% of these items (i.e., three or more) for this subscale, whereas 118 (21.1%) did not complete any items. Most of the missing data (80% of missing data) were for parents of younger children (<3 years), who did not receive these items.

Changes to child’s sleep routine

We asked parents to rate whether their child’s sleep routine had *stayed the same*, *changed a little*, or *changed a lot* since March 15, 2020. We collapsed these responses into *stayed the same* or *changed* for the *changes to child’s sleep routine* variable. Most parents (94.8%) provided data for this item, but 29 parents did not.

Predictor variables: Family economic well-being and parent COVID-19 pandemic-related stress

Changes to employment

Parents were asked whether they were working before March 15, 2020, and whether they were currently working. Then, we determined whether parent working status had changed following the COVID-19 shutdown using these two questions. We categorized *change to employment status* as follows: *employed* (i.e., worked before and after March 15, 2020, and not working before but working after March 15, 2020, $N = 6$), *remained unemployed* (i.e., not working before or after March 15, 2020), and *lost employment* (i.e., worked before March 15, 2020, but not after). Almost all parents (98%) provided data for this item.

Changes to monthly income

We then asked how parents’ household monthly income changed since March 15, 2020 (*increased a lot*, *increased a little*, *stayed the same*, *decreased a little*, or *decreased a lot*). For our analyses, we collapsed these responses into three groups to create a *change to monthly income* variable: *increased* (i.e., either a lot or a little), *stayed the same*, and *decreased* (i.e., either a lot or a little). Most parents (93.7%) provided data for this item, but 35 parents did not.

Change in access to resources

We provided a list of 14 resources and asked if the parent (or anyone in the parent’s family) began using any of the listed community or government resources or assistance programs since March 15, 2020. Here, we report on the on nine core programs that have comparable programs in other states: WIC; food stamps (including Ohio Direction Card, EBT, and SNAP); food banks, food pantries, or other food aid (besides WIC or food stamps); Temporary Assistance to Needy Families (TANF) or Ohio Works First; housing supplements or subsidies (Section 8 or

Housing Choice Vouchers); unemployment benefits; and Medicaid (such as CareSource or Molina Healthcare of Ohio). We created a *change in access to resources* variable as the sum of new resources the parent (or family) began using since March 15, 2020. Our response rate for this variable was high: 545 parents (98%) provided data for this item.

Parent experience with COVID-19 pandemic-related stress

We designed these questions to capture the amount and severity of stress families were experiencing during the COVID-19 shutdown. We asked about a broad array of social and economic conditions that the respondents or their families and close friends had experienced since March 15, 2020. We asked parents to respond *yes* or *no* to 38 stressors. If *yes* was selected, parents received a follow-up question asking them to evaluate how difficult that experience was for them (*not at all, a little, somewhat, or very*). Sample stressors included working in health care setting with patients; having hours reduced by employer; becoming seriously ill or hospitalized; moving to lower quality housing; feeling stuck at home; taking on more care or education of children than planned; and losing contact with family and friends outside the home. Although these experiences may have not been directly related to the COVID-19 pandemic, they were experiences that were potentially particularly stressful due to pandemic-specific health, social, and economic conditions at this time. To increase the likelihood that these questions specifically addressed COVID-19 pandemic-related stress, parents were explicitly asked to report their experiences while keeping the current pandemic context in mind.

We created two variables from these responses. First, we calculated the total *COVID-19 pandemic-related stressors* score as the sum of affirmatively indicated stressors. This was intended to reflect the number of stressors experienced during this time, which may influence the well-being of household members independent of the parent's experienced degree of difficulty. This scale had high internal consistency within our sample ($\alpha = 0.76$). In terms of missing data, 532 parents (95.2%) completed at least 80% of these items (i.e., 30 items), 466 parents (83.3%) completed 36 or more items, and 10 (1.8%) did not complete any items for this scale. Second, we used the responses to the follow-up questions weighing the impact of these stressors on the responding parent to create a *degree of difficulty for parent* score. This represented the average difficulty of experienced stressors, with higher scores representing more experienced difficulty. We chose to calculate this stressor score separately from the count of experiences to capture the impact of the experiences on parents and approximate a level of parent stress or difficulty during this time. Because the level of difficulty follow-up questions were only asked if the parent responded *yes* to a given stressor, there were not enough cases across the sample to measure reliability for this scale. Parents provided answers to follow-up questions up to 25 times; however, 90% of parents provided answers to 13 or fewer items, and 3.0% of parents did not complete any items.

Notably, preliminary Pearson's correlations revealed that family economic well-being and parent COVID-19 pandemic-related stress variables were significantly correlated (with correlations ranging from weak to moderate; see Supplemental Material 2). This finding suggests that these measures tapped into connected aspects of family context. Thus, we included all five predictor variables in each model investigating associations with child behavior outcomes.

Covariates: Demographic characteristics

We asked parents to report their age (in years), as well as their child's age (in years and months, later converted to months for all children) and child's sex (male or female). We asked parents to report their highest level of education, ranging from *no formal education* to *doctoral degree*, and

then collapsed responses into five groups: less than a high school diploma, high school diploma or GED, some college, bachelor's degree, and master's degree or higher. Parents also reported their marital status (which was collapsed into three groups: married, living with partner, and single) and race (which was collapsed into three groups: White, Black/African American, and other). Lastly, we asked parents to report their 2019 annual household income (using \$10,000 increments), and then collapsed these responses into four groups: less than \$30,000, \$30,000 to \$59,999, \$60,000 to \$89,999, and \$90,000 or more. Table 1 reports descriptive statistics and missing data for these demographic categories.

Statistical analysis

All analyses were conducted using IBM SPSS Statistics 26. To examine the associations between child behaviors with family economic well-being and parent COVID-19 pandemic-related stress, we conducted a series of regression models. We employed linear regression with each of the PEDS subscale scores as the dependent variables for Models 1 through 4. In modeling changes in children's sleep patterns, we used logistic regression with a dummy variable outcome (change vs. stayed the same) for Model 5. Because the change in access to resources variable was novel and could be coded in a number of ways, we also tested alternative models where this variable was recoded and treated as a dichotomous (none vs. one or more new resources) or categorical variable (none, one new resource, vs. three or more new resources). We found that the model results were robust to the different ways the predictor was coded, and therefore treated the variable as a continuous sum score as planned. In each model, we controlled for the following demographic characteristics: parent age, education level, marital status, and race; 2019 annual household income; and child age and sex. To handle missing data, we used listwise deletion, resulting in the following sample sizes for each model: Model 1, $N = 425$; Model 2, $N = 429$; Model 3, $N = 431$; Model 4, $N = 370$; and Model 5, $N = 437$. To assess statistical significance, we used two-tailed tests of $p < 0.05$.

RESULTS

Descriptives of outcome and predictor variables

We provide the descriptive statistics of our key variables in Table 2. Although the mean scores appear to be at the lower end of the scales for most of these measures, there is variation within the sample as indicated by the standard deviations. Compared with the anxious/withdrawn behaviors and fearful behaviors, the mean for acting-out behaviors appears to be particularly high and with larger variations across the sample. Within this subscale, several behaviors appeared to be particularly common among children during this time. About one third of parents reported their child had often or very often acted whiny (32.8%), seemed hyperactive (29.8%), or gotten frustrated too easily (29.3%), whereas 41.4% reported their child often or very often wanted things right away (not shown in Table 2). More than half of parents indicated that their child's sleep patterns had changed a little (42.5%) or a lot (15%) since March 15, 2020 (not shown in Table 2). The other 42.5% of sampled children either did not experience a change in their sleep patterns ($N = 215$) or never had a regular schedule ($N = 10$; not shown in Table 2).

Table 2 also provides descriptive results for variables related to exosystem changes (linked to family economic well-being) and microsystem changes (linked to parent COVID-19 pandemic-related stress). We found that 15% of our sampled parents experienced job loss since the shutdown began, and another 23% were unemployed before and during the study period. Notably, 45.4% of parents reported a decrease in the household's monthly income since March

TABLE 2 Descriptives for outcome and predictor variables

	<i>N</i> reporting	Frequency	<i>M</i>	<i>SD</i>	Min	Max
Outcome variables: target child behaviors						
Anxious and withdrawn behaviors	506		2.1	2.6	0.0	16.0
Fearful behaviors	517		3.0	3.1	0.0	15.0
Acting-out behaviors	518		6.2	4.3	0.0	18.0
COVID-19 pandemic-related behaviors ^a	434		1.6	1.6	0.0	8.0
Changes to child's sleep routine	530					
Stayed the same		42.5%				
Changed		57.5%				
Predictor variables: exosystem changes						
Change to employment status	547					
Employed		61.8%				
Remained unemployed		23.2%				
Lost employment		15.0%				
Change to monthly income	524					
Increased		9.0%				
Stayed the same		45.6%				
Decreased		45.4%				
Change in access to resources	545		0.55	0.96	0	7
Predictor variables: microsystem changes						
Total COVID-19 pandemic-related stressors	549		8.2	4.3	0.0	25.0
Degree of difficulty for parent	542		1.8	0.7	0.0	3.00

Note: ^aThis subscale only asked if target children was >3 years old.

15, 2020. Although most parents (67.2%) did not begin using any new resources, about 20% of parents reported that they had begun using one of nine core assistance programs since March 15, 2020. Approximately 13% of parents reported that they had begun using two or more of these programs since March 15, 2020. The programs most selected were food stamps (11.3%), food banks and pantries (12.0%), and unemployment benefits (10%), indicating increasing economic hardship experienced by some of our sample families since the shutdown began.

Parents reported experiencing, on average, more than eight of a potential 25 COVID-19 pandemic-related stressors (Table 2). Three-quarters of parents experienced five or more stressors (mean = 8.2 ± 4.3) and one quarter experienced 11 or more stressors. Of the stressors asked about, parents were most likely to report feeling stuck at home (67.9%), having children feel stuck at home (79.9%), and having to take on more care or education of their children than they had planned (71.6%). Although less common, 18.6% of parents reported that they or someone close to them became seriously ill or was hospitalized, and 12% experienced the death of someone close to them during this time. Almost one third of parents (32.2%) reported knowing someone diagnosed with COVID-19. The degree of difficulty for parent measure indicates substantial impact of these events on parents, given that the mean difficulty level was almost 2 on a scale of 0 to 3 (Table 2).

Associations between family context and child behaviors

The results of the regression models are shown in Table 3. Each model included family economic well-being variables (change to employment, change to monthly income, and change in access to resources) and parent COVID-19 pandemic-related stress variables (total COVID-19

pandemic-related stressors and degree of difficulty for parent). Covariates for each model included child age and sex; parent age, education level, marital status, and race; and 2019 annual household income.

Model 1 evaluated the relationship between family economic well-being and parent COVID-19 pandemic-related stress and child anxious and withdrawn behaviors ($N = 425$, $F = 4.01$, $p < 0.01$). Total COVID-19 pandemic-related stressors ($B = 0.15$, $SE = 0.03$, $p < 0.01$) and degree of difficulty for parent ($B = 0.23$, $SE = 0.20$, $p < 0.01$) both had significant positive associations with child anxious and withdrawn behaviors. In contrast, changes in parental employment, household monthly income, and access to resources were not associated with this outcome. In contrast, parent marital status of living with partner and annual household income of \$60,000 to \$89,999 or \geq \$90,000 had marginally significant negative associations ($p < 0.1$); only child age was positively associated with these behaviors ($p < 0.05$).

Model 2 shows similar results for child fearful behaviors ($N = 429$, $F = 2.67$, $p < 0.01$). Total COVID-19 pandemic-related stressors ($B = 0.16$, $SE = 0.04$, $p < 0.01$) and degree of difficulty for parent ($B = 0.20$, $SE = 0.24$, $p < 0.01$) both had significant positive associations with this child behavior subscale as well, whereas family economic changes were not associated with this outcome. Annual household income of \$60,000–\$89,999 had a marginally significant negative association ($p < 0.1$).

Model 3 shows similar results for child acting-out behaviors ($N = 431$, $F = 4.29$, $p < 0.01$). Total COVID-19 pandemic-related stressors ($B = 0.17$, $SE = 0.05$, $p < 0.01$) and degree of difficulty for parent ($B = 0.26$, $SE = 0.32$, $p < 0.01$) both had significant positive associations with child acting-out behaviors, whereas the family economic variables had no associations. Child age was significantly associated with more expression of these behaviors ($p < 0.05$), whereas female child sex was associated with less expression of these behaviors ($p < 0.05$). Additionally, having a 2019 annual household income of \$30,000 to \$59,999 was significantly associated with less expression of these behaviors ($p < 0.05$).

Model 4 shows similar results for child COVID-19 pandemic-related behaviors ($N = 370$, $F = 2.71$, $p < 0.01$). As in the other models, total COVID-19 pandemic-related stressors had significant positive associations with child COVID-19 pandemic-related behaviors ($B = 0.08$, $SE = 0.20$, $p < 0.01$), whereas degree of difficulty for parent approached significance ($B = 0.26$, $SE = 0.11$, $p = 0.06$), and family economic variables had no statistically significant associations. Black/African American parent race was significantly positively associated ($p < 0.05$) and high school diploma/GED and some college for highest level of parental education were each significantly negatively associated with this outcome ($p < 0.05$). Parent marital status of living with partner had a marginally significant negative association with this outcome ($p < 0.1$).

Model 5 evaluated the relationship between family economic well-being and parent COVID-19 pandemic-related stress and changes to child's sleep routine using logistic regression ($N = 437$, Akaike information criterion = 600.61). Total COVID-19 pandemic-related stressors ($b = 0.05$, $SE = 0.03$, $p = 0.06$) and degree of difficulty for parent ($b = 0.30$, $SE = 0.17$, $p = 0.07$) both had marginally significant positive associations with changes to child's sleep routine, suggesting that parent COVID-19 pandemic-related stress may be associated with changes to children's sleep patterns. Further, change in access to resources also had a marginally significant positive association with changes to child's sleep routine ($b = 0.22$, $SE = 0.12$, $p = 0.08$). Single marital status had a marginally significant negative association with the outcome ($p < 0.1$), but only child age was positively associated with changes to child's sleep routine ($p < 0.05$).

DISCUSSION

The COVID-19 pandemic led to a global crisis and massive disruptions in family life. This article describes the results of a bioecological approach to understanding the family context during

TABLE 3 Associations between family economic well-being and parent COVID-19 pandemic-related stress variables and child behaviors

Variable	Anxious and withdrawn behaviors ^a			Fearful behaviors ^b			Acting-out behaviors ^c			COVID-19 pandemic-related behaviors ^d			Changes to child's sleep routine ^e		
	B	SE	p	B	SE	p	B	SE	p	B	SE	p	b	SE	p
Change in employment status ^f															
Remained unemployed	0.04	0.33	0.43	0.02	0.41	0.77	0.00	0.53	0.96	0.03	0.23	0.52	-0.03	0.28	0.91
Lost employment	-0.03	0.38	0.51	-0.05	0.48	0.32	-0.03	0.62	0.61	-0.01	0.27	0.81	-0.45	0.32	0.17
Change to monthly income ^g															
Stayed the same	0.03	0.44	0.75	-0.02	0.55	0.79	-0.09	0.71	0.25	0.09	0.29	0.32	0.14	0.37	0.69
Decreased	0.01	0.44	0.89	-0.01	0.54	0.90	-0.11	0.70	0.17	0.11	0.29	0.21	0.07	0.36	0.86
Change in access to resources	0.02	0.15	0.69	-0.06	0.19	0.28	-0.01	0.24	0.85	-0.02	0.13	0.69	0.22	0.12	0.08
Total COVID-19 pandemic-related stressors	0.15	0.03	0.00**	0.16	0.04	0.00**	0.17	0.05	0.00**	0.19	0.02	0.00**	0.05	0.03	0.06
Degree of difficulty for parent	0.23	0.20	0.00**	0.20	0.24	0.00**	0.26	0.32	0.00**	0.11	0.14	0.06	0.30	0.17	0.07
Parent age	0.00	0.02	0.99	0.04	0.02	0.48	0.07	0.03	0.15	0.03	0.01	0.56	0.02	0.02	0.28
Child age	0.17	0.01	0.00**	-0.05	0.01	0.35	0.12	0.01	0.03*	0.09	0.01	0.13	0.01	0.00	0.04*
Child sex ^h	-0.04	0.24	0.36	0.00	0.30	0.95	-0.10	0.39	0.03*	0.06	0.17	0.26	-0.05	0.21	0.79
Parent education ⁱ															
HS diploma or GED	-0.08	0.64	0.37	0.04	0.79	0.71	-0.01	1.03	0.95	-0.29	0.61	0.03*	0.65	0.56	0.24
Some college	-0.16	0.62	0.18	-0.01	0.76	0.95	-0.03	0.99	0.79	-0.43	0.59	0.02*	0.61	0.54	0.26
Bachelor's	-0.09	0.67	0.40	-0.02	0.82	0.88	-0.05	1.07	0.64	-0.26	0.62	0.11	0.51	0.58	0.38
Master's or higher	0.03	0.72	0.73	0.07	0.88	0.46	0.03	1.14	0.78	-0.23	0.63	0.11	0.64	0.62	0.30
Parent marital status ^j															
Living with partner	-0.10	0.41	0.06	-0.04	0.51	0.47	-0.01	0.66	0.88	-0.11	0.30	0.06	-0.41	0.35	0.23
Single	0.02	0.35	0.74	-0.05	0.44	0.48	-0.01	0.57	0.93	-0.05	0.24	0.46	-0.55	0.30	0.07
Parent race ^k															
Black/AA	-0.07	0.36	0.23	-0.08	0.44	0.18	-0.08	0.57	0.16	0.16	0.27	0.01*	0.16	0.30	0.58

TABLE 3 (Continued)

Variable	Anxious and withdrawn behaviors ^a			Fearful behaviors ^b			Acting-out behaviors ^c			COVID-19 pandemic-related behaviors ^d			Changes to child's sleep routine ^e		
	B	SE	p	B	SE	p	B	SE	p	B	SE	p	B	SE	p
Other	-0.01	0.52	0.80	0.04	0.62	0.42	0.03	0.81	0.59	0.02	0.36	0.72	0.56	0.46	0.22
2019 annual household income ^f															
\$30,000-\$59,999	-0.04	0.36	0.47	-0.07	0.45	0.23	-0.13	0.59	0.03*	-0.11	0.26	0.10	-0.48	0.31	0.12
\$60,000-\$89,999	-0.12	0.47	0.08	-0.12	0.58	0.09	-0.11	0.75	0.10	-0.09	0.31	0.24	-0.01	0.41	0.97
\$90,000 or more	-0.16	0.48	0.06	-0.03	0.60	0.75	-0.13	0.78	0.10	-0.09	0.33	0.35	-0.23	0.42	0.59
Adjusted R ²	0.13			0.08			0.14			0.09			N/A		
Sample size (N)	425			429			431			370 ^m			437		

Note: AA = African American; HS = high school; N/A: not applicable. ^aModel 1. ^bModel 2. ^cModel 3. ^dModel 4. ^eModel 5. ^fReference group = employed. ^gReference group = increased. ^hReference group = male. ⁱReference group = never graduated high school. ^jReference group = married. ^kReference group = White. ^lReference group = Less than \$30,000. ^mThis subscale was only asked if target children was aged >3 years old.

*p < 0.05. **p < 0.01.

such a crisis. As detailed here, the CFS employed a cross-project approach to develop and distribute a survey across three existing research projects to better understand changes to the family context as a result of the pandemic and subsequent school and workplace shutdowns. In this study, we sought to understand families' economic changes and stress, and their association with child behaviors, as well as to highlight insights into using a cross-project methodology.

Associations between parent COVID-19 pandemic-related stress and child behaviors

Although not necessarily surprising given the widespread economic changes occurring across the country, we found high rates of pandemic-induced economic stressors. Additionally, we found that most parents reported experiencing at least some COVID-19 pandemic-related stressors, although they differed in the relative degree of difficulty experienced. In our sample, we did not find family economic well-being variables to be associated with the level of expression of child behaviors, which is somewhat at odds with what we would expect from previous studies using the family stress model (e.g., Conger et al., 2002; Gershoff et al., 2007; McLoyd, 1990). Perhaps our measures of economic change were too immediate to have time to form an association with child behavior expression during this time. Because family income during early childhood has lifelong impacts (e.g., Duncan et al., 2010, 2015), it is critical for future research to track the influence of pandemic economic shocks on long-term development and to understand whether these changes persisted after shutdown orders were relaxed.

However, across four of these models, total COVID-19 pandemic-related stressors and degree of difficulty for parent were significantly associated with the level of expression of child behaviors linked to emotional distress, including anxious and withdrawn behaviors, fearful behaviors, acting-out behaviors, and COVID-19 pandemic-related behaviors. Additionally, these variables had a marginally significant association with changes to child's sleep routine. In all instances, having a parent who experienced a greater number of stressors or a higher degree of difficulty with those stressors was associated with more frequent expression of problem behaviors. It may be that the breadth of stressors induced by the pandemic was more salient to parents and children than the more narrow economic stressors we captured. Given the overwhelming nature of the pandemic, including high levels of fear (Fitzpatrick et al., 2020) and dramatic decreases in availability of social interactions outside the home (Sheehan et al., 2020), these factors, as well as how families processed them, may have been more likely to shape stress and behavior within the family. Continuing to understand how families experienced and processed these stressors is a key direction for future research. However, our findings suggest that the family stress model is applicable during times of societal stress, although a broader set of stressors should be incorporated to fully capture the ways in which families and children are shaped by societal and economic change during a period of crisis.

Limitations

Our study has several limitations. Although we contacted families already involved in our research projects to participate in the CFS, the survey distribution email did not align with previously planned contact periods, and thus participants were not primed for this activity. As such, many families may have missed the invitation to participate, thus leading to relatively low participation rates. Further, our sole reliance on electronic communication may have reduced CFS response rates because poor Internet connectivity or data use restrictions may have kept families from participating. Additionally, our survey contained approximately 250 questions, and it is possible that we lost some participants due to Internet failure, survey fatigue, or lack of

interest in taking on the burden of participation during this hectic time. However, few participants started but did not finish the survey ($N < 30$), suggesting that the length of the survey was not a major issue. Another limitation of this study was its reliance on concurrent parental reports of family conditions and child behaviors, which led to an inability to specify temporal ordering. Our results thus reflect associations that may include bidirectional correlates of parental stress and child behaviors (e.g., Kochanova et al., 2022; McQuillan & Bates, 2017). Although we cannot make causal inferences about the current study's findings, the associations themselves are important, given concerns that the prolonged stress of the COVID-19 pandemic may lead to stress contagion between parents and their children, with implications for parental and child well-being (Imran et al., 2020; Liu & Doan, 2020). Furthermore, we are unable to generalize our findings to larger populations because our study is cross-sectional and uses a convenience sample mostly from urban areas in Ohio. However, our study was strengthened by capturing important socioeconomic and racial diversity present across the U.S. (U.S. Census Bureau, 2019).

Finally, parental reports of child behaviors have the potential disadvantage of being less "objective" measures of child well-being. However, previous studies suggest that as parents are much more familiar with their children than are research team members, parental reports may be more holistic measures than direct assessments (Bates & Bayles, 1994; Mangelsdorf et al., 2000; Mebert, 1991). Furthermore, parental perceptions of child behavior have been shown to be linked to later child outcomes (e.g., Molfese et al., 2010), suggesting that they are a valuable means of investigating child behavior in the absence of direct assessments.

Implications

This study sheds light on the ways that the COVID-19 pandemic shutdown shaped family life. Our results highlight that aspects of children's developmental ecosystems were differentially affected by the COVID-19 pandemic. These findings provide evidence that children's behaviors were associated with parent COVID-19 pandemic-related stress during the initial COVID-19 shutdown. However, understanding lasting changes to the family context and children's development related to COVID-19 pandemic conditions requires future longitudinal research. Nonetheless, these findings provide initial evidence that the stressors of the pandemic have translated into emotional distress for children, which needs to be considered by researchers and family practitioners alike. Finding ways to minimize the stress families are experiencing due to the ongoing pandemic, as well as pursuing interventions that reduce children's emotional distress are both important future directions.

This study also emphasizes the benefits of leveraging existing projects to capture a broader perspective on children's family context in times of crisis, attesting to the potential importance of rapid family research during crisis periods. First, this study allowed participants an opportunity to share their experiences in a time that many were likely feeling isolated. In fact, future studies may want to expand participation to study family coparents and older children, so that multiple voices can further flesh out the family context during crisis periods. Second, by reaching out to families already enrolled in existing studies, we were able to collect rapid real-time information across a diverse sample. Not only was our final CFS sample diverse in regard to family structure (only 54% of the parents were married), but it also included parents who had less than a 4-year college education (57%) and a substantial Black/African American sample (25%), populations that are often missing from electronic-based survey research (Lourenco & Tasimi, 2020). Finally, data collected before and after the COVID-19 pandemic will allow us to explore how pre-pandemic family conditions and post-pandemic child outcomes are associated with the lived experiences of this critical historical period (e.g., as suggested by Gildner & Thayer, 2020).

AUTHOR NOTE

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