Chaos during the COVID-19 outbreak: Predictors of household chaos among low-income families during a pandemic

Anna D. Johnson1 | Anne Martin2 | Anne Partika1 | Deborah A. Phillips1 | Sherri Castle3 | The Tulsa SEED Study Team*

1Department of Psychology, Georgetown University, Washington, District of Columbia, USA
2Independent Consultant, New York, New York, USA
3Early Childhood Education Institute, University of Oklahoma, Tulsa, Oklahoma, USA

Correspondence
Anna D. Johnson, Department of Psychology, Georgetown University, 301-D White-Gravenor Hall, 3700 O St. NW, Washington, DC 20057, USA.
Email: anna.johnson@georgetown.edu

Funding information
Foundation for Child Development, Grant/Award Number: GU-03-2017; George Kaiser Family Foundation; Heising-Simons Foundation, Grant/Award Numbers: 2017-329, 2016-107; National Institute of Child Health and Human Development; Spencer Foundation; National Institutes of Health Eunice Kennedy Shriver National Institute of Child Health and Human Development, Grant/Award Number: R01 HD092324-01A; the Spencer Foundation, Grant/Award Number: 201800034

Abstract
Objective: The objective of this study was to explore whether household chaos measured during the COVID-19 pandemic is predicted by prepandemic parental and household characteristics.

Background: The COVID-19 pandemic has dramatically altered children’s home environments and routines due to stay-at-home orders, school closures, and economic shocks. These disruptions have been especially challenging for low-income families who have limited resources and have been disproportionately affected by the pandemic. Household chaos, which captures routines, organization, stability, noise, and crowding in the home, is a documented threat to parent functioning and positive child development. The pandemic has likely exacerbated household chaos, especially for low-income families.

Method: Data come from a larger, ongoing study of low-income children and their parents in Tulsa, Oklahoma; this analysis relies on data from the subset of low-income parents who responded to surveys when their children were in kindergarten (in 2018–2019) and during the pandemic, when their children were in first grade (n = 335). We use multivariate ordinary least squares regression models to test whether household chaos measured during the pandemic is predicted by prepandemic parental and household characteristics.

Results: Prepandemic parental depression and household chaos were significantly predictive of chaos during the pandemic, even after accounting for household demographics.

*The Tulsa SEED Study Team includes Diane Horm, Gigi Luk, April Dericks, Jane Hutchison, and Owen Schochet.
Implications: The current study highlights pandemic-induced elevations in parental distress and household chaos among low-income families. Results will provide valuable direction to policymakers, educators, and parents on how best to offset negative impacts of the COVID-19 pandemic on family functioning and child development.

KEYWORDS
chaotic households, COVID-19 pandemic, low-income families

INTRODUCTION

The COVID-19 pandemic has dramatically altered most families’ experiences, in large part by changing the home environment. In spring 2020, nearly every state in the United States ordered or recommended school closures, triggering the transition of least 55.1 million students to remote learning from home (Education Week, 2020). This transition placed new demands on parents, especially those of younger children who need monitoring and assistance to engage in distance learning. At the same time, many adults were temporarily or permanently laid off, leading to financial and material hardship and struggles to meet basic needs; others transitioned to working remotely while having to care for their children at home. In this context, parents began spending more time at home with children, and, in some instances, with additional household members such as young adult children or elderly parents.

The sudden disruption to family routines, coupled with new demands for organization necessitated by home-based distance learning, have likely been especially challenging for low-income families. These families have experienced disproportionately high rates of COVID-related illness, hospitalizations, and deaths, as well as associated economic and material hardship (Bauer, 2020; Center for Translational Neuroscience, 2020a). Moreover, such experiences of hardship appear to have set in motion a chain reaction whereby caregivers who have worse financial problems and more difficulty paying for basic needs such as food, housing, and utilities also report greater emotional distress (Center for Translational Neuroscience, 2020b). This is perhaps not surprising in light of the family stress model (Conger & Elder, 1994), which links hardships to increased caregiver emotional distress and disrupted household functioning, thereby increasing child emotional distress (e.g., Goodman et al., 2011). Furthermore, as in ordinary times, the household crowding, noise, and changes in family schedules and routines imposed by COVID-19 may take a harsher toll on low-income families who have fewer resources to circumvent or overcome these challenges (e.g., Evans et al., 2010; Mills-Koonce et al., 2016). Thus, there is a need to identify the features of low-income children’s home environments that are associated with greatest risk during the pandemic.

The evidence on household chaos is particularly pertinent to this objective. Chaos, a widely recognized threat to positive child development (Evans et al., 2005; Evans & Wachs, 2010; Fiese & Winter, 2010; Hardaway et al., 2012; Hughes & Ensor, 2009; Wachs & Corapci, 2003), captures the extent of disorganization, instability, noise, and crowding in the home—features that likely characterize COVID-related disruptions to children’s home environments. Broadly, according to ecological systems theory, household chaos influences children’s microsystems—their immediate context—and impinges on developmentally supportive proximal interactions with materials and people in the home (Bronfenbrenner & Evans, 2000).

There are two pathways through which household chaos may be expected to affect children: through its direct impacts on children and its indirect impacts via parents (Fiese & Winter, 2010). Direct impacts on children include distraction and attention-interference, which impede development of children’s executive functioning and self-regulatory skills
(Vernon-Feagans et al., 2016) as well as academic skills like reading (Johnson et al., 2008; Martin et al., 2012; Petrill et al., 2004). Household chaos—exacerbated by economic adversity—has also been associated with physiological measures of child stress (Brown et al., 2019). Indirectly, the overstimulating and unpredictable nature of chaotic households may be less conducive to the kind of predictable and responsive parent–child interactions that promote positive child development (Hughes et al., 2014; Vernon-Feagans et al., 2016; Zvara et al., 2014). Parents who are distracted and overwhelmed by household chaos may struggle to plan and execute cognitively stimulating activities, scaffold social and academic problem-solving skills, and regulate their own emotions, resulting in greater parental stress, harsh discipline, and conflict in the home (Barrett & Fleming, 2011; Deater-Deckard et al., 2010; Mills-Koonce et al., 2016).

The prevalence and predictors of household chaos during the COVID-19 pandemic have not been documented, and past studies on the impacts of natural or economic disasters, which typically lack predisaster data, provide little guidance to identify which families may be at greatest risk for disruptions to functioning and well-being due to the COVID-19 pandemic. During nonpandemic times, household chaos is associated with family low-income status (Brown et al., 2019; Evans et al., 2010) and related demographic factors such as low maternal education, single-parent status, and nonstandard work hours (Johnson et al., 2008; Valiente et al., 2007; Vernon-Feagans et al., 2016). Yet these relations give little insight into the specific causal mechanisms responsible. One possible candidate is maternal depression, which like chaos is associated with economic hardship (Conger & Elder, 1994). In two studies, household chaos was associated with maternal depression (Hur et al., 2015; Pike et al., 2006), but because the two constructs were measured at the same time, the directionality of these effects remains unclear. Furthermore, it is not known whether the same characteristics that predict chaos under typical conditions do so during a crisis, despite the utility of this knowledge for educators and human service providers seeking to mitigate the effects of the COVID-19 pandemic.

Using data collected before and during the ongoing pandemic, the current study tackles this timely and important question. Specifically, we capitalize on an existing cohort study following low-income children who entered public pre-kindergarten in Tulsa, Oklahoma, in 2017. When the pandemic erupted, the children were completing first grade, and their parents were surveyed about their experiences after schools closed due to the pandemic. Parents had also been surveyed approximately 1 year earlier, when children were in kindergarten. We use these “pre-COVID” data to predict household chaos among parents in spring 2020, shortly after COVID-19 erupted. Crucially, we are able to account for prepandemic household chaos, enhancing our ability to draw conclusions about the directionality of any observed associations between the predictors and chaos.

We test two hypotheses with these data. First, both life course theory (e.g., Caspi & Roberts, 2001) and research on distress during disasters, such as Hurricanes Katrina and Sandy (e.g., Hausman et al., 2020; Rhodes et al., 2010) suggest continuity in personality, behavior, and distress, which may explain why prior research on chaos in particular has found strong correlations of household chaos measured at different points across the early childhood years (Lecheile et al., 2020). Thus, we first hypothesize that prepandemic chaos will predict chaos during the pandemic. Second, we expect that prepandemic parental depression, net of prepandemic chaos, will predict chaos during the pandemic. Emerging research indicates that the COVID-19 pandemic has generally increased parental distress (American Psychological Association, 2020; Brown et al., 2020; Center for Translational Neuroscience, 2020b), and parents with a history of depression may be at particular risk for depression during the pandemic (Martin et al., 2020; Wadsworth et al., 2004). To the extent that depression drains parents’ ability to manage their households, particularly in a time of crisis, it may result in greater chaos. In testing these hypotheses, we aim to contribute to the research base that will guide the targeting of support services to parents at highest risk for hardships known to impair child development.
METHOD

Participants

The Tulsa SEED Study (n ≈ 1400) recruited low-income children in public preschool arrangements in Tulsa, OK, in 2017; additional students who had not enrolled in public preschool were recruited in 2018 during their kindergarten year. The present study draws on data from the kindergarten (2018–2019) and first grade (2019–2020) waves of the study. Parents completed online surveys in the spring of kindergarten and again in the spring of first grade after Tulsa Public Schools were closed due to the COVID-19 outbreak. Each survey took approximately 25 min to complete, and parents received a gift card to incentivize survey completion. All study elements and protocols were approved by the University of Oklahoma—Tulsa Institutional Review Board. This report draws only on parents who responded to both the kindergarten and COVID-19 surveys (n = 335). As shown in Table 1, approximately 23% of children in the analytic sample were Black, 36% were Hispanic/Latinx, and 23% were White. The mean monthly family income was $2521, and 52% of parents were unmarried.

Measures

Household chaos during the COVID-19 pandemic

Parents reported on six items selected from the widely used and well-validated Confusion, Hubbub, and Order Scale (CHAOS; Matheny Jr. et al., 1995). Although the full scale includes 15 items, to reduce respondent burden during the pandemic, we selected six key items with greatest pertinence to household functioning in households with young children (see Evans & Wachs, 2010): “First thing in the day, we have a regular routine,” “We are usually able to stay on top of things,” “Our home is a good place to relax,” “We almost always seem to be rushed,” “You can’t hear yourself think in our home,” and “There is often a fuss going on in our home.” Parents indicated how much each item described their home environment on a 4-point scale (1 = not at all like your home, 4 = very much like your home). Positively valanced items were reverse-coded, and items were summed to form a scale (α = .69). When the six- and 15-item versions were compared using data from the prior year (when the full scale was administered), the scale alphas and their correlations with constructs of interest (e.g., income, depression) were comparable.

Predictors

All predictors were drawn from the Parent Survey that was administered in the 2018–2019 school year, when study children were in kindergarten. Parental depression was measured using the Center for Epidemiologic Studies Depression Scale—Short Form (Andresen et al., 1994). Parents reported how often during the past week they felt 10 symptoms such as “I felt depressed,” “I felt that everything I did was an effort,” and “I felt lonely.” Responses ranged from 0 (rarely or none of the time; less than 1 day) to 3 (all of the time; 5–7 days). Items were summed to form a scale (α = .83). We also included a measure of household food insecurity, which is associated with depression, disrupted household functioning, and poorer parent wellbeing (Johnson & Markowitz, 2018). We coded food insecurity affirmatively if parents indicated that they sometimes or often worried whether their food would run out before they got money to buy more, a standard item used in national surveys including during the COVID-19 pandemic (Bauer, 2020).
|   | Study variable descriptives and correlations (n = 335) |   |
|---|-----------------------------------------------------|---|
|   | M (SD) % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|----------|---|---|---|---|---|---|---|---|---|----|----|----|----|
| 1 | HH chaos during COVID-19 (first grade) | 11 (3) |   |   |   |   |   |   |   |   |    |    |    |    |
| 2 | Black | 23 | −0.13* |   |   |   |   |   |   |   |    |    |    |    |
| 3 | Hispanic/Latinx | 36 | 0.07 | −0.41* |   |   |   |   |   |   |    |    |    |    |
| 4 | Other non-White | 11 | 0.00 | −0.19* | −0.27* |   |   |   |   |   |    |    |    |    |
| 5 | White | 23 | 0.05 | −0.30* | −0.41* | −0.19* |   |   |   |   |    |    |    |    |
| 6 | Single mother | 52 | −0.01 | 0.24* | −0.25* | 0.13* | −0.05 |   |   |   |    |    |    |    |
| 7 | HH size | 5 (2) | 0.11* | −0.18* | 0.12* | 0.02 | −0.08 | −0.23* |   |   |    |    |    |    |
| 8 | Primary home language not English | 17 | 0.06 | −0.25* | 0.60* | −0.16* | −0.25* | −0.26* | 0.09 |   |    |    |    |    |
| 9 | Parent education HS/GED or less | 49 | −0.01 | −0.19* | 0.39* | −0.14* | −0.16* | −0.19* | 0.09 | 0.38* |   |    |    |    |
| 10 | Child documented disability | 10 | −0.14* | 0.02 | 0.09 | 0.03 | −0.10 | −0.12* | 0.00 |   |    |    |    |    |
| 11 | Monthly family income | $2521 (1617) | 0.03 | −0.11* | −0.30* | 0.12* | −0.06 | −0.23* | −0.10 |   |    |    |    |    |
| 12 | Parent depressive symptoms | 6 (5) | 0.39* | 0.07 | −0.20* | 0.04 | 0.13* | 0.08 | −0.05 | −0.11* | −0.10 | 0.04 | −0.01 |    |
| 13 | Food insecurity | 33 (47) | 0.22* | 0.06 | 0.00 | −0.04 | 0.08 | −0.10 | 0.04 | 0.09 | 0.08 | −0.23* | 0.25* |    |
| 14 | HH chaos during K | 10 (3) | 0.56* | −0.06 | −0.02 | 0.04 | 0.03 | 0.01 | 0.14* | −0.05 | 0.02 | 0.03 | −0.06 | 0.37* | 0.22* |

Abbreviations: HH, household; HS/GED, high school/graduate equivalency diploma; K, kindergarten.

*p < .05.
Other predictors were household income (log-transformed), race/ethnicity (Black, Hispanic/Latinx, other non-White, White), whether parent was single, household size, whether the primary language was not English, low parental education (high school/GED or less), and whether the study child had a documented disability. Finally, we included a measure of household chaos during kindergarten ($\alpha = .65$), allowing our model to predict change in chaos from before the pandemic to early in the pandemic in spring 2020. Although we administered the full 15-item scale in the kindergarten wave, for the sake of consistency, we selected only those six items that were repeated during the COVID-19 survey in first grade. (Use of the full 15-item scale did not substantively change results.)

**Analytic plan**

We proceeded in three steps. First, we examined changes in scores on the household chaos scale and its individual items from before to during the COVID-19 pandemic. Next, we conducted bivariate correlations between the predictors (measured when children were in kindergarten) and the chaos scale measured during the pandemic (when study children were in first grade). Third, we regressed chaos scale scores during the pandemic on the predictors using ordinary least squares (OLS) regression. To aid interpretation of regression results, we standardized measures of parental depressive symptoms and household chaos in the pre-COVID-19 and COVID-19 waves.

**RESULTS**

As shown in Table 1, household chaos increased between kindergarten ($M = 10, SD = 3$), before the COVID-19 pandemic, and first grade, during the pandemic ($M = 11, SD = 3$). This was driven by change in four of the six chaos items: an increase in being rushed and a decrease in ability to stay on top of things, having a regular routine, and being able to relax at home (results not shown but available on request).
Household chaos during the pandemic was bivariately associated with larger household size \((r = 0.11)\), food insecurity \((r = 0.22)\), parental depressive symptoms \((r = 0.39)\), and household chaos \((r = 0.56)\) in the previous year, when study children were in kindergarten (all \(ps < .05\); Table 1). Chaos was not bivariately associated with race/ethnicity, single motherhood, primary language, parent education, family income, or whether the child had a disability.

Table 2 presents results from an OLS model in which chaos during the COVID-19 pandemic was regressed on all prepandemic predictors, including depression and chaos. Although prepandemic household size and food insecurity were no longer significantly associated with chaos during the pandemic in the regression model, parental depressive symptoms and household chaos remained significantly predictive of chaos even after controlling for all other predictors. Specifically, each increment of 1 SD in depressive symptoms in parents pre-COVID, when their children were in kindergarten, was associated with an increase of 0.27 SD in household chaos during the COVID-19 pandemic. Each increment of 1 SD in household chaos pre-COVID, when children were in kindergarten, was associated with an increase of 0.49 SD in household chaos during the COVID-19 pandemic. According to Cohen (1988), these effect sizes fall between small (0.20) and medium (0.50) magnitude.

**DISCUSSION**

The COVID-19 pandemic has changed American families’ home lives drastically, most notably because of widespread stay-at-home orders, school closures, and disruptions to parental employment. Emerging research points to increased financial hardship as well as decreased parental mental health as common byproducts of the pandemic, particularly for low-income families (Center for Translational Neuroscience, 2020b). Developmental researchers have identified household chaos as a key feature of the home environment that covaries with low-income status (Brown et al., 2019; Evans et al., 2010) and negatively influences parenting, family dynamics, and child outcomes (Fiese & Winter, 2010). We build on prior theoretical and empirical work on household chaos and its correlates and predictors to examine the characteristics that may predict chaos during a global pandemic.

This study is the first, to our knowledge, to identify parental depression *before* a disaster as a predictor of household chaos during a disaster. This is consistent with prior research during nonpandemic times, which has linked parental depression to features of chaos, such as reports of daily hassles (Cicchetti et al., 1998; Kliewer & Kung, 1998), or to scores on a chaos scale (Hur et al., 2015; Pike et al., 2006), using cross-sectional data. Not surprisingly, emerging research documents significant and sustained effects of the COVID-19 pandemic on parental distress (American Psychological Association, 2020; Brown et al., 2020; Center for Translational Neuroscience, 2020b), which is known to hamper positive parent–child interactions and contribute to child behavior problems during nonpandemic times (e.g., Goodman et al., 2011; Kiernan & Huerta, 2008; Lovejoy et al., 2000). One recent study found that financial hardship during the pandemic increases parental emotional distress, which in turn predicted increased child behavior problems (Center for Translational Neuroscience, 2020b). It is possible that household chaos is one mechanism linking parental distress to child behavior problems during the pandemic, as found in pre-COVID studies (Mills-Koonce et al., 2016; Vernon-Feagans et al., 2016).

Further research is needed to tease out the precise mechanisms responsible for these associations. Although parental depression may lead to chaos, it is also possible that they both stem from a third, common factor, such as a negative life event (e.g., illness or loss of employment; Price et al., 2002). Both depression and chaos may also reflect the depletion of parents’ self-regulatory capacities due to the stressors of daily life with insufficient income (Mani et al., 2013). Exposure to stressors specific to the COVID-19 pandemic (fear of infection,
loss of income, demands of distance learning, additional household members) has likely further drained parents’ ability to enforce—and perhaps the importance they place on implementing—organization and routines at home.

Alongside parental depression, earlier household chaos was also highly predictive of household chaos during the pandemic. This is consistent with our hypothesis based on prior research showing continuity in chaos over time (Lecheile et al., 2020). It may be useful for future research to explore the reasons for this continuity. Does consistency in chaos reflect consistency in living circumstances, or does chaos itself make it more difficult to fend off chaos in the future? Further research will be needed to trace the repercussions of COVID-19–induced elevations in parental distress and chaos for children, particularly in low-income families. Follow-up research should also seek to address some of the limitations of the current study. These include limited generalizability outside low-income families in Tulsa and the lack of additional measures, such as parent executive functioning, which could shed light on mechanisms—and points of intervention—for the associations detected here.

Implications

The disruptions the COVID-19 pandemic have caused to family life are unlikely to end immediately, particularly as many school districts may be only partially or intermittently open for in-person instruction in academic year 2021–2022. To the extent that children and adults who might otherwise be out of the house are learning and working from home, household chaos may persist or increase, especially for low-income families such as those in our study. Indeed, our data suggest that one of the strongest predictors of chaos is prior chaos, implying that as pandemic conditions stay the same or worsen, chaos will continue. So what can be done to reduce household chaos for vulnerable families with children? Ensuring families have sufficient access to mental health supports is key. Medicaid and other low- and no-cost insurance options should cover mental health services for low-income parents. In nonpandemic times, schools often provide mental health resources via school-based social workers, counselors, and referrals to specialized services. During a pandemic that has moved much in-person schooling online, school administrators could make school-based mental health personnel available via distance learning platforms—for example, by connecting families with the school social worker or nurse during noninstructional time. Generally, funneling more financial resources into low-income households via additional pandemic stimulus checks, enhanced unemployment benefits, child tax credits, and rent default and mortgage loan forgiveness could reduce chaos by staving off crowding and increasing resources parents can allocate toward accessing mental health supports.

In sum, these findings advance family science by contributing to our understanding of families’ risk for greater household chaos during the COVID-19 pandemic and may also apply in noncrisis times. In the near term, results may provide valuable direction to policy-makers, educators, and parents on how best to support families with children and offset negative impacts on later family well-being and child development.

ACKNOWLEDGMENT

We are grateful to the families who participated in our study and for the teachers and school district officials who have supported them during this unprecedented time. There are no conflicts of interest to report. All errors are the responsibility of the authors. This study was supported by grants from the Heising-Simons Foundation (grant nos. 2016-107 and 2017-329), the Foundation for Child Development (grant no. GU-03-2017), the Spencer Foundation (grant no. 201800034), and the National Institutes of Health Eunice Kennedy Shriver National Institute of Child Health and Human Development (grant no. R01 HD092324-01A). Data
collection was also supported by the George Kaiser Family Foundation and the University Strategic Organization Initiative at the University of Oklahoma.

ETHICS STATEMENT
The research reported here was reviewed and approved by the University of Oklahoma IRB and complies with all ethical guidelines. The work presented here is original, not under review or published elsewhere. There are no conflicts of interest to report. All errors are the authors.

ORCID
Anna D. Johnson https://orcid.org/0000-0002-9832-6724

REFERENCES
American Psychological Association. (2020). Stress in the time of COVID-19 (Vol. 13). Retrieved July, 2020, https://www.apa.org/news/press/releases/stress/2020/stress-in-america-covid-july.pdf.
Andresen, E. M., Malmgren, J. A., Carter, W. B., & Patrick, D. L. (1994). Screening for depression in well older adults: Evaluation of a short form of the CES-D. American Journal of Preventive Medicine, 10(2), 77–84. https://doi.org/10.1016/S0749-3797(18)30622-6
Barrett, J., & Fleming, A. S. (2011). Annual research review: All mothers are not created equal: Neural and psychobiological perspectives on mothering and the importance of individual differences. Journal of Child Psychology and Psychiatry, 52(4), 368–397. https://doi.org/10.1111/j.1469-7610.2010.02306.x
Bauer, L. (2020). About 14 million children in the U.S. are not getting enough to eat. Brookings Institution https://www.brookings.edu/blog/up-front/2020/07/09/about-14-million-children-in-the-us-are-not-getting-enough-to-eat/
Bronfenbrenner, U., & Evans, G. W. (2000). Developmental science in the 21st century: Emerging theoretical models, research designs, and empirical findings. Social Development, 9(1), 115–125. https://doi.org/10.1111/1467-9507.00114
Brown, E. D., Anderson, K. E., Garnett, M. L., & Hill, E. M. (2019). Economic instability and household chaos relate to cortisol for children in poverty. Journal of Family Psychology, 33(6), 629–639. https://doi.org/10.1037/fam0000545
Brown, S. M., Doom, J. R., Lechuga-Pena, S., Watamura, S. E., & Koppels, T. (2020). Stress and parenting during the global COVID-19 pandemic. Child Abuse & Neglect, 110, 104699. https://doi.org/10.1016/j.chiabu.2020.104699
Caspi, A., & Roberts, B. W. (2001). Target article: Personality development across the life course: The argument for change and continuity. Psychological Inquiry, 12(2), 49–66.
Center for Translational Neuroscience. (2020a). The basic truth about basic needs: Structural inequalities exist based on income and race/ethnicity among households with young children during the pandemic. University of Oregon https://medium.com/rapid-ec-project/the-basic-truth-about-basic-needs-f505132d173c
Center for Translational Neuroscience. (2020b). A hardship chain reaction: Financial difficulties are stressing families’ and young children’s wellbeing during the pandemic, and it could get a lot worse. University of Oregon https://medium.com/rapid-ec-project/a-hardship-chain-reaction-3c3f3577b930
Cicchetti, D., Rogosch, F. A., & Toth, S. L. (1998). Maternal depressive disorder and contextual risk: Contributions to the development of attachment insecurity and behavior problems in toddlerhood. Development and Psychopathology, 10(02), 283–300.
Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum Associates.
Conger, R. D., & Elder, G. H. (1994). Families in troubled times: Adapting to change in rural America. De Gruyter Aldine.
Deater-Deckard, K., Sewell, M. D., Petrill, S. A., & Thompson, L. A. (2010). Maternal working memory and reactive negativity in parenting. Psychological Science, 21(1), 75–79. https://doi.org/10.1177/095679769609564073
Education Week. (2020). Coronavirus and school closures in 2019–2020. Retrieved September 16, https://www.edweek.org/ew/section/multimedia/map-coronavirus-and-school-closures.html.
Evans, G. W., Eckrenode, J., & Marcynyszyn, L. A. (2010). Chaos and the macrosetting: The role of poverty and socioeconomic status. In G. W. Evans & T. Wachs (Eds.), Chaos and its influence on children’s development: An ecological perspective (pp. 225–238). American Psychological Association.
Evans, G. W., Gonnella, C., Marcynyszyn, L. A., Gentile, L., & Salpekar, N. (2005). The role of chaos in poverty and children’s socioemotional adjustment. Psychological Science, 16(7), 560–565. https://doi.org/10.1111/j.0956-7976.2005.01575.x
Evans, G. W., & Wachs, T. (Eds.). (2010). Chaos and its influence on children’s development: An ecological perspective. American Psychological Association.
Fiese, B. H., & Winter, M. A. (2010). The dynamics of family chaos and its relation to children’s socioemotional well-being. In G. W. Evans & T. Wachs (Eds.), Chaos and its influence on children’s development: An ecological perspective (pp. 49–66). American Psychological Association.
Goodman, S. H., Rouse, M. H., Connell, A. M., Broth, M. R., Hall, C. M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. Clinical Child and Family Psychology Review, 14(1), 1–27. https://doi.org/10.1007/s10567-010-0080-1

Hardaway, C. R., Wilson, M. N., Shaw, D. S., & Dishion, T. J. (2012). Family functioning and externalizing behaviour among low-income children: Self-regulation as a mediator. Infant and Child Development, 21(1), 67–84. https://doi.org/10.1002/icd.765

Hausman, E. M., Black, S. R., Bromet, E., Carlson, G., Danzig, A., Kotov, R., & Klein, D. N. (2020). Reciprocal effects of maternal and child internalizing symptoms before and after a natural disaster. Journal of Family Psychology, 34(7), 836–845. https://doi.org/10.1037/fam0000653

Hughes, C., & Ensror, R. (2009). How do families help or hinder the emergence of early executive function? New Directions for Child and Adolescent Development, 2009(123), 35–50. https://doi.org/10.1002/ed.234

Hughes, C., Roman, G., & Ensror, R. (2014). Parenting and executive function: Positive and negative influences. In S. H. Landry & C. L. Cooper (Eds.), Wellbeing in children and families (Vol. 1, pp. 131–155). Wiley-Blackwell.

Hur, E., Buettner, C. K., & Jeon, L. (2015). Parental depressive symptoms and children’s school readiness: The indirect effect of household chaos. Journal of Child and Family Studies, 24, 3462–3473. https://doi.org/10.1007/s10826-015-0147-1

Johnson, A. D., & Markowitz, A. J. (2018). Food insecurity and family wellbeing outcomes among households with young children. The Journal of Pediatrics, 196, 275–282. https://doi.org/10.1016/j.jpeds.2018.01.026

Johnson, A. D., Martin, A., Brooks-Gunn, J., & Petrill, S. A. (2008). Order in the house! Associations among household chaos, the home literacy environment, maternal reading ability, and children’s early reading. Merrill-Palmer Quarterly, 54(4), 445–472. https://doi.org/10.1353/mpq.0.0009

Kiernan, K. E., & Huerta, M. E. (2008). Economic deprivation, maternal depression, parenting and children’s cognitive and emotional development in early childhood. The British Journal of Sociology, 59(4), 783–806. https://doi.org/10.1111/j.1468-4446.2008.00219.x

Kliewer, W., & Kung, E. (1998). Family moderators of the relation between hassles and behavior problems in inner-city youth. Journal of Clinical Child Psychology, 27(3), 278–292.

Lecheile, B. M., Spinrad, T. L., Xu, X., Lopez, J., & Eisenberg, N. (2020). Longitudinal relations among household chaos, SES, and effortful control in the prediction of language skills in early childhood. Developmental Psychology, 56(4), 727–738. https://doi.org/10.1037/dev0000896

Lovejoy, M. C., Graczyk, P. A., O’Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. Clinical Psychology Review, 20(5), 561–592. https://doi.org/10.1016/s0272-7358(98)00100-7

Mani, A., Mullainathan, S., Shafir, E., & Zhao, J. (2013). Poverty impedes cognitive function. Science, 341(6149), 976–980. https://doi.org/10.1126/science.1238041

Martin, A., Partika, A., Johnson, A., Castle, S., Horn, D., & The Tulsa SEED Study Team. (2020). Both sides of the screen: Predictors of parents’ and teachers’ depression and food insecurity during COVID-related distance learning [Manuscript submitted for publication].

Martin, A., Razza, R., & Brooks-Gunn, J. (2012). Specifying the links between household chaos and preschool children’s development. Early Child Development and Care, 182(10), 1247–1263. https://doi.org/10.1080%2F03004430.2011.605522

Matheny, A. J., Wachs, T. D., Ludwig, J., & Phillips, K. (1995). Bringing order out of chaos: Psychometric characteristics of the confusion, hubbub, and order scale. Journal of Applied Developmental Psychology, 16(3), 429–444. https://doi.org/10.1016/0193-3973(95)0028-4

Mills-Koonce, W. R., Willoughby, M. T., Garrett-Peters, P., Wagner, N., Vernon-Feagans, L., & the Family Life Project Key Investigators. (2016). The interplay among socioeconomic status, household chaos, and parenting in the prediction of child conduct problems and callous-unemotional behaviors. Development and Psychopathology, 28(3), 757–771. https://doi.org/10.1017/s0954579416000298

Petrell, S. A., Price, T., Pike, A., & Plomin, R. (2004). Chaos in the home and socioeconomic status are associated with cognitive development in early childhood: Environmental mediators identified in a genetic design. Intelligence, 32(5), 445–460. https://doi.org/10.1016/j.intell.2004.06.010

Pike, A., Iervolino, A. C., Eley, T. C., Price, T. S., & Plomin, R. (2006). Environmental risk and young children’s cognitive and behavioral development. International Journal of Behavioral Development, 30(1), 55–66. https://doi.org/10.1177/0165025406062124

Price, R. H., Choi, J. N., & Vinokur, A. D. (2002). Links in the chain of adversity following job loss: How financial strain and loss of personal control lead to depression, impaired functioning, and poor health. Journal of Occupational Health Psychology, 7(4), 302–312. https://doi.org/10.1037/1076-8998.7.4.302

Rhodes, J., Chan, C., Paxson, C., Rouse, C. E., Waters, M., & Fussell, E. (2010). The impact of hurricane Katrina on the mental and physical health of low-income parents in New Orleans. American Journal of Orthopsychiatry, 80(2), 237–247. https://doi.org/10.1037/1939-0025.2010.01027.x

Valiente, C., Lemery-Chalfant, K., & Reiser, M. (2007). Pathways to problem behaviors: Chaotic homes, parent and child effortful control, and parenting. Social Development, 16(2), 249–267. https://doi.org/10.1111/j.1467-9507.2007.00383.x
Vernon-Feagans, L., Willoughby, M., Garrett-Peters, P., & The Family Life Project Key Investigators. (2016). Predictors of behavioral regulation in kindergarten: Household chaos, parenting, and early executive functions. *Developmental Psychology, 52*(3), 430–441. https://doi.org/10.1037/dev0000087

Wachs, T. D., & Corapci, F. (2003). Environmental chaos, development and parenting across cultures. In C. Raeff & J. Benson (Eds.), *Social and cognitive development in the context of individual, social and cultural processes* (pp. 54–83). Routledge.

Wadsworth, M. E., Gudmundsen, G. R., Raviv, T., Ahlkvist, J. A., McIntosh, D. N., Kline, G. H., Rea, J., & Burwell, R. A. (2004). Coping with terrorism: Age and gender differences in effortful and involuntary responses to September 11th. *Applied Developmental Science, 8*(3), 143–157. https://doi.org/10.1207/s1532480xads0803_4

Zvara, B. J., Mills-Koonce, W. R., Garrett-Peters, P., Wagner, N. J., Vernon-Feagans, L., Cox, M., & the Family Life Project Key Contributors. (2014). The mediating role of parenting in the associations between household chaos and children’s representations of family dysfunction. *Attachment & Human Development, 16*(6), 633–655. https://doi.org/10.1080%2F14616734.2014.966124

**How to cite this article:** Johnson, A. D., Martin, A., Partika, A., Phillips, D. A., Castle, S., & The Tulsa SEED Study Team* (2022). Chaos during the COVID-19 outbreak: Predictors of household chaos among low-income families during a pandemic. *Family Relations, 71*(1), 18–28. https://doi.org/10.1111/fare.12597