**ORIGINAL ARTICLE**

# Role of maternal emotion in child maltreatment risk during the COVID-19 pandemic

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## Abstract

**Purpose**  Preliminary research early in the COVID-19 pandemic suggested children appeared to be at increased risk for child maltreatment, particularly as parents struggled with mental health and economic strains. Such strains were likely to influence parental emotions about their children, affecting their parent-child interactions to contribute to elevated maltreatment risk. To identify the potential affective elements that may contribute to such increased maltreatment risk, the current study focused on whether maternal worry about children's behavior specifically as well as maternal anger were related to increased risk for neglect or physical or psychological aggression six months into the pandemic.

**Method**  The racially diverse sample included 193 mothers who completed an online survey during the COVID-19 pandemic in late September-early October 2020.

**Results**  Mothers' reported increases in neglect and physical and psychological aggression during the pandemic were significantly related with established measures of maltreatment risk. Furthermore, path models indicated that maternal anger and worry about children's behavior, as well as their interaction, were significantly related to indicators of physical aggression risk and neglect during the pandemic, but only maternal anger related to increased psychological aggression during the pandemic.

**Conclusions**  Maternal worry and anger about children's behavior may have exacerbated risk for maltreatment under the stressful conditions of the COVID-19 pandemic. Findings suggest affective reactions of both parental worry and anger focused on child behavior warrants greater empirical attention and consideration in intervention efforts both during the pandemic and potentially post-pandemic.

**Keywords**  Child abuse · Conflict tactics scales · Coronavirus · Neglect · Verbal aggression · Parenting · Anxiety

Child maltreatment officially includes physical abuse, psychological abuse, and neglect (U.S. Department of Health and Human Services [DHHS], 2021), with these three forms often co-occurring (Kim et al., 2017; Witt et al., 2016). Despite commonalities, risk factors for these different forms of maltreatment may exhibit subtle differences (Doidge et al., 2017; Lo et al., 2017), which could meaningfully inform maltreatment prevention. Official reports of child maltreatment are widely recognized to underestimate its prevalence

(Sedlak et al., 2010; Stoltenborgh et al., 2015). Instead of relying on official records, parent reports of both their beliefs and behaviors often serve as proxies for *child maltreatment risk* (e.g., Bavolek & Keene, 2001; Chaffin & Valle, 2003; Milner, 1994). For example, parents who engage in physical discipline are more likely to become physically abusive given robust links between both forms of parent-child aggression (Afifi et al., 2017; Durrant et al., 2009; Gershoff & Grogan-Kaylor, 2016; Rodriguez, 2010).

The COVID-19 pandemic induced a host of challenges globally, with remarkable impacts on children and families and on the systems intended to ensure child welfare. During the pandemic, child protective systems experienced a drastic decline in official reports (Jonson-Reid et al., 2026; Rapoport et al., 2020) mirrored by a decline in criminal filings for child maltreatment (Whelan et al., 2020). Experts attribute these systemic declines partly due to reduced access to

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children by most mandated reporters (e.g., teachers, physicians, mental health professionals) (Baron et al., 2020). Emerging research from early in the pandemic suggested that children in the U.S. could be at increased risk for maltreatment (Bullinger, Boy et al., 2020; Bullinger, Raissian et al., 2020) in part linked to a historic collapse of the economy and employment losses (Connell & Strambler, 2021; Lawson et al., 2020; Lee, Ward, Lee et al., 2021; Rodriguez, Lee et al., 2021). Additionally, during the pandemic, parents' struggles with mental health issues and social isolation have been linked to increased risk for child maltreatment (Brown et al., 2020; Calvano et al., 2021; Lee, Ward, Lee et al., 2021; Rodriguez, Lee et al., 2021). Although such broad indicators of parental stress and mental health during the pandemic have been assessed, precisely how parents may be reacting emotionally about their children during the pandemic has not been well examined. Specifically, clarifying parents' affective reactions to children's behavior may lend insight into the proximal mechanisms whereby child maltreatment risk has been exacerbated during the pandemic. Simply identifying that maltreatment risk has increased during the pandemic is insufficient if we cannot also ascertain the factors underlying that increased risk.

## Parental Affect and Maltreatment Risk

Current research has documented a number of cognitive risk factors associated with child maltreatment risk (Azar et al., 2016; Camilo et al., 2020; Milner, 2000; Rodriguez et al., 2019, 2020), which often feature prominently in the psychoeducational approaches adopted by the majority of maltreatment prevention strategies. However, recent rigorous meta-analytic evaluations document modest and often disappointing success across maltreatment prevention efforts, many with relatively low effect sizes (Chen & Chan, 2016; Euser et al., 2015; van der Put et al., 2018). Consequently, the current approaches appear to be missing some of the important contributors to maltreatment risk.

Relative to the research on cognitive risk factors, less empirical attention has been given to clarifying the nature of affective processes in maltreatment risk. Although parents' emotions are recognized contributors to child maltreatment risk (see Stith et al., 2009 for review), theorists have urged greater attention to affective factors (Milner, 2000; Rodriguez & Pu, 2020). More intensive research inquiry on negative affect could add to the existing components that abuse prevention programs typically address to improve program efficacy. Parents' anger in particular has garnered the most empirical inquiry, with research demonstrating that anger relates to risk for physical abuse and neglect (McCarthy et al., 2016; Rodriguez & Richardson, 2007; Pidgeon &

Sanders, 2009; Stith et al., 2009), exacerbates maternal cognitive risk factors in physical child abuse risk (Rodriguez, 2018), and mediates the association between childhood abuse history and maternal physical abuse risk (Smith et al., 2014). Thus, although most abuse prevention programs focus on shifting cognitions, some programs incorporate anger management components based on the premise that a greater tendency to experience anger will be invoked to result in maltreatment behavior (e.g., Altafim & Linhares, 2016; Sanders et al., 2004; de Wit et al., 2020). Notably, most of the work that has evaluated anger in relation to child maltreatment risk has focused on physical abuse, with less attention in the literature (either pre-pandemic or during the pandemic) to whether parental anger is linked to their psychological aggression or neglect. Adults overall reported generalized increased levels of anger and frustration during the pandemic (American Psychological Association [APA], 2020). To date, however, research has not focused on parental anger and frustration with child behavior in relation to multiple forms of maltreatment, which may specifically relate to parent-child conflict during the COVID-19 pandemic—an oversight that would be particularly relevant for understanding child maltreatment risk during the uncertain times when many parents struggled with mental health and parenting stress (Lee, Ward, Chang et al., 2021; Patrick et al., 2020).

Furthermore, compared to the pre-pandemic research on anger in relation to child maltreatment risk, parental worry directed at their children has been neglected in the empirical literature. Parents' generalized anxiety and stress levels are typically related to physical abuse risk, and parents' stress is associated with neglect risk (Stith et al., 2009), likely because stressors detract from their ability to focus attention on parenting. During the pandemic, many parents appear to have experienced increases in parenting stress and generalized worry (APA, 2020; Lee, Ward, Chang et al., 2021; Patrick et al., 2020; Rodriguez, Lee et al., 2021; Thorell et al., 2021). One study found most parents reported increased general worries and at least one symptom of parental burnout, which they believed interfered with their parenting (Kerr et al., 2021).

Despite this research on parents' generalized worry, whether maltreatment risk is affected by parents' worry specifically in response to their children's behavior has not been investigated. Studies that consider parents' stress or anxiety are typically conceptualizing these as distal factors within the parents' lives that can be largely independent of the child (e.g., generalized anxiety, negative life events stress, daily stress, parenting stress; Stith et al., 2009) but may compromise their ability to parent optimally. Stress from the demands of parenting or daily life are not equivalent to being worried about how one's child is behaving. Distinct

from generalized parental stress or anxiety, experiencing worry about how a child behaved could more proximally relate to parent-child interactions. One study in China during the pandemic indicated that parents' worry about their children in particular was associated with their reports of more child behavior problems (Li & Zhou, 2021), although no connection was made to parents' maltreatment risk. Some early work suggested mothers' worry about their kindergarten children's behavior significantly related to their severe discipline use (Pinderhughes et al., 2000) and more recent work has implicated maternal worry about children's misbehavior in physical child maltreatment risk (Rodriguez, Silvia et al., 2021). Yet considerations of whether parental worry in response to children's behavior serves as a proximal affective trigger for maltreatment behavior is rare; the focus in most child abuse prevention efforts that do incorporate negative affect have centered on anger. Moreover, the role of parental worry about their children's behavior in relation to psychological aggression or neglect remains unknown. By examining both parental anger and parental worry about children's behavior simultaneously, the unique contribution of worry as a specific negative affect in child maltreatment risk can be clarified because literature on parental worry about children's behavior is virtually non-existent.

In the context of the exceptional COVID-19 pandemic strains, parents may experience both anger and worry at perceived child misbehavior—negative affect experiences that may compound each other to exacerbate maltreatment risk. Such additive effects have not been previously examined but research identifying cumulative negative affect can determine whether such compounded effects are especially problematic. Children's routines and structures were disrupted by the pandemic and school closures, increasing the likelihood of child behavior problems (Lee, Ward, Chang et al., 2021; Patrick et al., 2020) and the potential for parent-child conflict (Rodriguez et al., 2021; Thorell et al., 2021). Given the challenges and demands children and their parents have confronted during the pandemic, parents' emotional reactions to their children may be critical in whether parent-child interactions become aggressive or neglectful.

## Current Study

Identifying how negative affect of both anger and worry in response to perceived child misbehavior contributes to child maltreatment risk can provide insight into specific focal areas to incorporate into prevention and intervention. The present investigation evaluated whether maternal worry about children's behavior as well as their anger related to their reports of increased COVID-19 pandemic-related child maltreatment risk. Specifically, we examined

both emotions independently in relation to maternal reports of more neglectful behavior as well as maternal reports of greater physical and psychological aggression during the pandemic; these three maltreatment types were tested separately to clarify potentially unique contributors of maternal negative affect. Apart from their individual effects, we were further interested in the role of anger and worry combined as an interaction effect (e.g., which could imply mothers were more likely to demonstrate elevated maltreatment risk when worry about children's behavior exacerbated their anger or when their anger exacerbated their worry about their children's misbehavior). Such interaction effects would suggest that mothers experiencing both types of negative affect would be at even greater maltreatment risk. To enhance robustness in our statistical models, we controlled for factors known to affect maltreatment risk. For example, we controlled for the financial impact of employment loss given the millions who filed for unemployment in the first months of the pandemic; employment loss is associated with heightened levels of parent-child conflict and other negative outcomes for children (Gassman-Pines & Gennetian, 2020). We further controlled more broadly for socioeconomic status because socioeconomic factors such as income are associated with risk for child maltreatment (Conrad-Hiebner & Byram, 2020).

## Method

### Participants and Procedures

The sample consisted of mothers completing an online survey conducted approximately six months after the World Health Organization declared COVID-19 a pandemic, between Sept 26-Oct 5, 2020. The survey was created in Qualtrics and administered by Prolific, an online survey research and data collection company (Palan & Schitter, 2018). Research evaluating different online platforms for data quality conclude Prolific yields reliable, reproducible results (Peer et al., 2017) comparable to lab-based studies (Sauter et al., 2020). Prolific sent an email with the Qualtrics survey link to eligible participants (age 18 years or older, mothers of a child age 8 or younger, residing in the U.S.). Child maltreatment is more common among younger children (Sedlak et al., 2010), with nearly two-thirds of substantiated cases involving children age 8 or younger (DHHS, 2021); thus, this age group permits a focus on children at greater risk for maltreatment. Because Prolific distributes the Qualtrics link, data can remain de-identified and participants respond anonymously. After consenting and completing the survey, participants were compensated $7 through Prolific. Given the de-identified nature of the data,

the university institutional review board deemed this study exempt from oversight.

Data were cleaned and screened for errors or duplicates. Three items were embedded in the protocol as attention checks to confirm data quality; no participant missed more than one attention check. The total sample included 193 mothers ($M_{age}$ = 32.48, $SD_{age}$ = 5.91). Mothers self-identified their race as: 53.9% White, 45.6% Black, and 0.5% Native American/Alaskan; 3.1% of the full sample also identified as Latina and 10.4% also considered themselves biracial. In terms of mothers' educational attainment: 9.8% ≤ high school; 28.5% some college/technical school; 31.1% college degree; 29.0% > college degree. Median household income was reported between $50–60,000/year, with 32.1% reporting they receive public assistance. Nearly 81% of mothers reported currently living with a spouse/partner.

## Measures

### Child Maltreatment Risk

Mothers reported on *COVID-19 pandemic-related perceived changes in parenting* which has been measured in prior work early in the pandemic (Lee, Ward, Lee et al., 2021; Rodriguez, Lee et al., 2021). Using a 5-point Likert scale, mothers indicated how much they agreed from 1 (*strongly disagree*) to 5 (*strongly agree*) with each of the following "since the coronavirus/Covid-19 global health crisis began": (1) "I have spanked or hit my child more often than usual"; (2) "I have yelled at/screamed at my child more often than usual"; (3) "I have had to leave my child alone more often than usual"; (4) "I have used harsh words toward my child more often than usual"; (5) "I have not been able to make sure my child got the food they needed;" and (6) "I have been so caught up with my problems, I have not been able to show or tell my child that I loved them." We utilized the Hit/Spank response for Physical Aggression and created a summary score for neglect frequency by adding responses to items 3, 5, and 6 (Combined Neglect) and a summary score for psychological aggression by adding items 2 and 4 (Combined Verbal Aggression). Findings from early in the pandemic indicated these summary scores were significantly related to established measures of child maltreatment risk (Rodriguez, Lee et al., 2021).

The *Parent-Child Conflict Tactics Scale* (Straus et al., 1998) is widely used worldwide to estimate the frequency of parental discipline use and maltreatment (Beatriz & Salhi, 2019). Mothers reported how frequently they utilized 22 discipline tactics on three subscales (the current study focused on physical and psychological aggression). The Physical Assault subscale includes 13 items of widely varying physically aggressive behavior (e.g., spanking to scalding); the Psychological Aggression subscale includes 5 items on verbally aggressive and demeaning tactics (e.g., yelling or cursing at their child). To contribute to their total subscale scores, individual CTSPC items are weighted: reported use of a tactic 0, 1, or 2 times in the past year receive those corresponding weights; 3–5 times is weighted 4; 6–10 times is weighted 8; 11–20 times is weighted 15; and more than 20 times is weighted 25. The test authors provide evidence of construct and discriminant validity.

The *Adult-Adolescent Parenting Inventory-2* (AAPI-2; Bavolek & Keene, 2001) is a measure of child abuse risk developed to differentiate maltreating from non-maltreating parents. The AAPI-2 includes 40 items each rated on a 5-point Likert scale, from 1 (*strongly agree*) to 5 (*strongly disagree*). Items are summed to create a total score wherein higher scores indicate greater abuse risk. The AAPI-2 has been used in randomized controlled trials (e.g., Waterston et al., 2009), demonstrates reliability and validity with observed behavior (Conners et al., 2006), can identify low-income families who may not require intensive abuse prevention services (Lawson et al., 2015), and attained good internal consistency for mothers in the current study ($\alpha = .93$).

### Maternal Emotion

The *State-Trait Anger Expression Inventory* (STAXI; Spielberger, 1988) is a frequently used measure of anger tendencies that has been utilized in multiple community (e.g., Driscoll et al., 2010; Kim et al., 2019), clinical (e.g., Lievaart et al., 2016), and forensic settings (e.g., Trimble et al., 2015). We selected the Anger Expression subscale to measure manifestations of anger which is comprised of 20 items using a 4-point scale, from 1 (*almost never*) to 4 (*almost always*). The total Anger Expression score is generated by summing Anger-In items (i.e., the extent anger is internalized; $\alpha = .76$) with Anger-Out items (i.e., the extent anger is displayed; $\alpha = .76$), then subtracting the items from Anger-Control (i.e., anger regulation; $\alpha = .87$). Higher scores on the STAXI Anger Expression subscale suggest a stronger tendency to exhibit anger.

The *Parent-Child Vignettes* (PCV; Plotkin, 1983; Haskett et al., 2006) include 18 brief scenarios describing potential child misbehavior, wherein the parent is asked to imagine that the child in the scene is their own. The measure was developed to assess negative child attributions and punishment intentions. In a recent expansion of the PCV (Rodriguez, Silvia et al., 2021), questions following the vignettes were expanded to include reports of emotion the parent would feel in response to the scenario—the only known measure to assess both parental anger and worry regarding

children's behavior. For each vignette, the mother indicated her level of anger in response to the scene, from 1 (*not angry or frustrated at all*) to 9 (*very angry or frustrated*), as well as indicating her level of worry about her child from 1 (*not worried about my child at all*) to 9 (*very worried about my child*). A total score for PCV Anger and PCV Worry can be generated by summing across the 18 item responses, with higher scores indicative of greater parental anger and worry, respectively, in response to perceived child misbehavior. In the current study, PCV Anger and Worry scores evidenced good internal consistency: $\alpha = .91$ and .90, respectively.

## Covariates

Maternal *socioeconomic status* (SES) was estimated by standardizing both household income level and educational attainment and combining for a composite SES score. No other covariates that are not already potentially confounded with SES were included.

To control for the financial impact of the pandemic, mothers indicated whether they or their partner had experienced a change in employment due to the pandemic (previously unemployed, laid-off/furloughed, reduced hours, working from home, or no change). *Household employment loss* was dichotomized as no financial change (either unemployed pre-pandemic, no change, or working from home) versus employment loss indicative of financial impact (laid off or reduced hours).

## Data Analytic Plan

Preliminary analyses were conducted with SPSS 27. Because STAXI Anger Expression scores were significantly related to the PCV Anger score, we reduced data by creating a standardized composite of both scores for an overall Anger score to utilize in our main path analyses. Our primary analyses, testing the three path models depicted in Fig. 1, utilized Mplus 8.1 with full-information maximum likelihood methods. To judge model fit, root mean square error of approximation (RMSEA), standardized root-mean-square residual (SRMR), and comparative fit index (CFI) were examined. For RMSEA and SRMR, values below .08 are optimal, and for CFI, values $\geq 0.95$ indicate good fit (Kline, 2011). Reported path coefficients are standardized.

## Results

### Descriptive Findings for Covid-19 Pandemic Responses

In this sample, 10.5% of mothers indicated they were hitting more often since the pandemic began (either "agree" or "strongly agree"). Furthermore, 21% indicated they were yelling more often and 12% indicated they were using harsh words more often. Regarding decreased child supervision, 12% of mothers reported they were leaving their child alone more often; 5.2% agreed they were struggling to feed their children and 7.8% indicated they were demonstrating less love toward their children. In addition, 37.3% of mothers reported a household employment loss due to the pandemic. Table 1 includes mean scores for our main COVID-19 pandemic parenting scores.
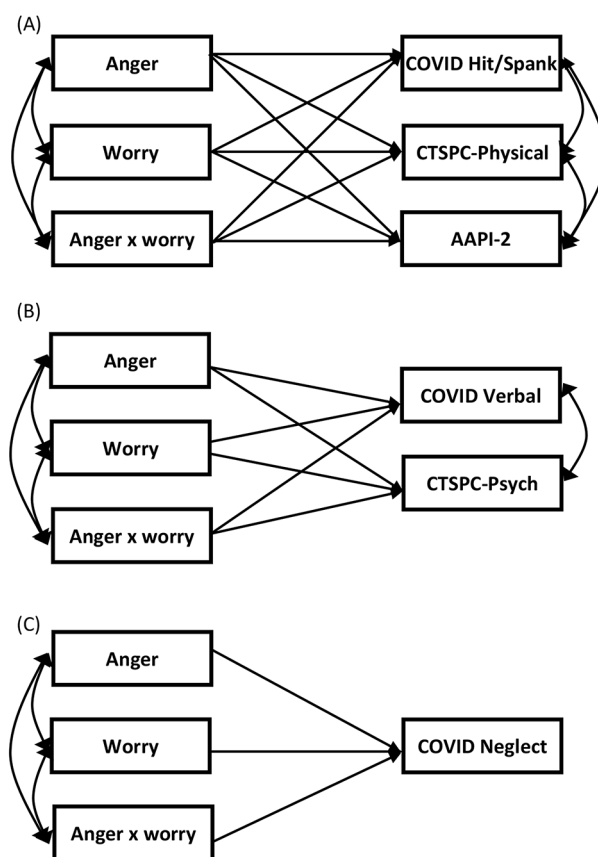


Fig. 1 Path models for Physical Aggression (Top), Psychological Aggression (Middle), and Neglect (Bottom). *Note.* All models control for socioeconomic status and household employment loss due to the COVID-19 pandemic. COVID variables assess COVID-19 pandemic-related perceived changes in frequency of Hit/Spank (A - top model), Verbal Aggression (B - middle model), and Neglect (C - bottom model)

**Table 1** *Means, Standard Deviations, and Correlations for Study Measures*

| | M (SD) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1. STAXI Anger Exp | 22.18 (9.76) | | | | | | | | |
| 2. PCV Anger | 64.57 (23.57) | .37*** | | | | | | | |
| 3. PCV Worry | 76.58 (27.72) | .03 | .39*** | | | | | | |
| 4. COVID-Spank | 1.66 (1.02) | .28*** | .28*** | .24*** | | | | | |
| 5. COVID-VerbAggr | 3.96 (2.09) | .37*** | .33*** | .15* | .57*** | | | | |
| 6. COVID-CombNeg | 4.78 (1.99) | .39*** | .36*** | .24*** | .49*** | .51*** | | | |
| 7. AAPI-2 Total | 96.54 (24.10) | .25*** | .41*** | .29*** | .49*** | .25*** | .38*** | | |
| 8. CTSPC Psych | 21.32 (21.11) | .23** | .17* | .19** | .40*** | .53*** | .23** | .17* | |
| 9. CTSPC Physical | 12.24 (21.09) | .24*** | .30*** | .29*** | .58*** | .39*** | .45*** | .48*** | .46*** |

*Note.* 1 = State-Trait Anger Expression Inventory; 2 = Plotkin Child Vignettes (PCV), Anger; 3 = PCV, Worry; 4 = COVID-19 perceived increase spanking/hitting; 5 = COVID-19 Verbal Aggression combined score; 6 = Covid-19 Combined Neglect score; 7 = Adult-Adolescent Parenting Inventory-2 Total; 8 = Parent-Child Conflict Tactics Scale (CTSPC), Psychological Aggression; 9 = CTSPC Physical Assault Scale

*p ≤ .05, ** p ≤ .01, *** p ≤ .001

## Preliminary Analyses

Table 1 also provides the means and standard deviations for our primary measures in addition to correlations across measures. SES and household employment loss were entered as covariates (SES was significantly related to the AAPI-2 and CTSPC Physical Assault subscale, $p < .05$; household income was significantly related to COVID-19 perceived increase in spanking, $p < .05$; child age, however, was unrelated to all outcome measures, $p > .05$). Notably, mothers who believed they were hitting their children more often since the pandemic began, engaging in more verbal aggression (COVID Combined Verbal Aggression), and being more neglectful (COVID Combined Neglect) also obtained higher scores on the child abuse risk measure (AAPI-2) and reported more frequent physical and psychological aggression (CTSPC).

## Primary Analyses

Table 2 presents findings of the three path analyses predicting physical aggression, psychological aggression, and neglect, with covariates. The path model for physical aggression (Fig. 1 A), including COVID-19 perceived increase in hitting/spanking, CTSPC Physical Assault subscale scores,

**Table 2** *Standardized Path Coefficients for* Fig. 1 *Models: Physical Aggression, Psychological Aggression, and Neglect*

| | Physical Figure 1A | | Psychological Figure 1B | | Neglect Figure 1C | |
|---|---|---|---|---|---|---|
| | β | p | β | p | β | p |
| Worry → COVID Parenting[a] | .17 | .012 | .04 | .574 | .15 | .010 |
| Anger → COVID Parenting | .26 | <.001 | .40 | <.001 | .38 | <.001 |
| Anger x Worry → COVID Parenting | .19 | .001 | .02 | .830 | .21 | <.001 |
| SES → COVID Parenting | .09 | .208 | .05 | .444 | .09 | .164 |
| Employment Loss → COVID Parenting | .16 | .019 | .13 | .051 | .10 | .104 |
| Worry → CTSPC[b] | .22 | .003 | .13 | .067 | | |
| Anger → CTSPC | .25 | <.001 | .23 | .001 | | |
| Anger x Worry → CTSPC | .17 | .009 | −.07 | .290 | | |
| SES → CTSPC | .13 | .045 | −.10 | .166 | | |
| Employment Loss → CTSPC | .11 | .114 | .09 | .200 | | |
| Worry → AAPI-2 Total | .22 | <.001 | | | | |
| Anger → AAPI-2 Total | .32 | <.001 | | | | |
| Anger x Worry → AAPI-2 Total | .22 | <.001 | | | | |
| SES → AAPI-2 Total | .11 | .111 | | | | |
| Employment Loss → AAPI-2 Total | .08 | .182 | | | | |

*Note.* Worry = Plotkin Child Vignettes (PCV), Worry; Anger = PCV, Anger; SES = socioeconomic status (income, educational level); AAPI-2 = Adult-Adolescent Parenting Inventory-2. Covariances not shown. **Bolded** values signify significance

[a]COVID Parenting = COVID-19 pandemic perceived increase in Hit/spank score for Physical; COVID Verbal Aggression Combined score for COVID-19 pandemic perceived increase in psychological aggression; *or* COVID Combined Neglect Score for COVID-19 pandemic perceived increase in neglect

[b]CTSPC = Parent-Child Conflict Tactics Scale Physical Assault subscale for Physical *or* Psychological Aggression subscale for Psychological

AAPI-2 child abuse risk scores, and both covariates, demonstrated strong fit, RMSEA = .000, SRMR = .028, CFI = 1.00. Controlling for SES and pandemic-related household income loss, the interaction of worry and anger significantly related to higher COVID-19 Hit/Spank scores (β = .19, $p$ = .001) as well as higher AAPI-2 abuse risk scores (β = .22, $p$ < .001) and reports of engaging in more frequent physical aggression during the pandemic on the CTSPC (β = .17, $p$ = .009); main effects of anger and worry were also significantly related to all three physical child maltreatment risk scores (for anger and worry respectively, COVID-19 Hit/Spank scores, β = .26, $p$ < .001 and β = .17, $p$ = .012; AAPI-2, β = .32, $p$ < .001 and β = .22, $p$ < .001; CTSPC Physical Assault subscale, β = .25, $p$ < .001 and β = .22, $p$ = .003).

The path model for psychological aggression (Fig. 1B), including COVID-19 Combined Verbal Aggression scores, CTSPC Psychological Aggression scores, and covariates, also evidenced strong fit, RMSEA = .000, SRMR = .028, CFI = 1.00. In contrast to physical aggression, only the main effect of anger was significantly related to higher COVID-19 Combined Verbal Aggression scores (β = .40, $p$ < .001) and higher CTSPC Psychological Aggression scores (β = .23, $p$ = .001); the main effect of worry and the interaction effect between both emotions were not significantly related to either indicator of psychological aggression during the pandemic.

For neglect, the path model including COVID-19 Combined Neglect (Fig. 1 C) and both covariates demonstrated strong fit, RMSEA = .000, SRMR = .033, CFI = 1.00. Similar to physical aggression, the main effects of anger (β = .38, $p$ < .001) and worry (β = 0.15, $p$ = .010) were both independently significantly related to higher COVID-19 Neglect scores, as was the interaction effect of anger and worry (β = .21, $p$ < .001).

## Discussion

The present study investigated the role of both anger and parental worry in maternal child maltreatment risk during the COVID-19 pandemic. Six months into the pandemic, mothers reported on whether they perceived they had increased their physical or psychological aggression or neglect of their children since the beginning of the pandemic. Current findings indicate that mothers' anger and worry about children's misbehavior independently and in combination were significantly related to their perceived increases in physically aggressive behavior and perceived increased neglect during the pandemic. Additionally, mothers' anger and worry demonstrated main and interaction effects in relation to standard measures of child abuse risk and reported use of physical aggression tactics completed during the pandemic.

However, only anger, not parental worry, was related to mothers' reported increase in verbal aggression and psychological aggression tactics utilized since the pandemic began.

Our findings suggest mothers' experience of anger is relevant to all forms of child maltreatment risk. Limited research has linked anger to neglect and psychological aggression, but prior work has implicated parental anger primarily in relation to physical abuse risk. The current study extends that work, demonstrating that anger was related to all three forms of maltreatment risk during the pandemic. This expansion has relevance for prevention programming, only some of which incorporate anger management (Altafim & Linhares, 2016; Sanders et al., 2004; de Wit et al., 2020). The present findings suggest anger management should be more widely adopted in an effort to broadly reduce maltreatment risk, but also with particular attention to anger directly in response to perceived child misbehavior. Limited data has been available on the experience of anger and frustration during the pandemic (APA, 2020), especially the experience of anger among parents, despite its potential relevance to child maltreatment risk.

Although parents' personal stress and anxiety has received empirical attention as a risk factor for maltreatment risk during the pandemic (Kerr et al., 2021; Lee, Ward, Chang et al., 2021; Patrick et al., 2020), whether parents were worried about their children's behavior (Li & Zhou, 2021) has not been adequately targeted as a specific, proximal contributor to child maltreatment risk. Research to date has rarely considered the role of parental worry regarding children's behavior as an additional affective factor independent of anger that contributes to physical maltreatment risk (Pinderhughes et al., 2000; Rodriguez, Silvia et al., 2021). The current investigation indicated that maternal worry about children's behavior was related not only to their perceived increased physical aggression toward their child since the pandemic began but to maternal self-report of neglectful behavior as well. These findings suggest the omission of both types of negative affect—anger and parental worry—may be an oversight in how prevention programs are currently delivered. However, maternal worries about child misbehavior were not significantly related to mothers' perceived increased psychological aggression during the pandemic. Given the dearth of empirical inquiry on parental worry about children's misbehavior as an affective cue for parental maltreatment behavior, future work should pursue whether parental worry about children's behavior is indeed a more proximal contributor to physical abuse and neglect but not psychological aggression to replicate these findings, in particular probing whether our findings are unique to the pandemic era.

Furthermore, the interaction between anger and worry was associated with perceived increased physical aggression

and neglect during the pandemic, but again, not with psychological aggression. Particularly during the pandemic, with children potentially experiencing their own challenges and exhibiting more difficult behavior (APA, 2020; Lee, Ward, Chang et al., 2021; Patrick et al., 2020), mothers' worry about their children's behavior may exacerbate their anger over their children's behavior, or their anger and frustration about their children's behavior may exacerbate parental worry—translating into even greater child maltreatment risk (although not for psychological aggression). These well-controlled models that account for shared variance between the two affective reactions underscore that both emotional processes are independently important. Parental worry about children's misbehavior in particular appears to have been overlooked in prior research investigating child maltreatment risk and consequently has not featured in child abuse prevention programs. Neglecting critical processes in child maltreatment may account for the disappointing efficacy observed in most child abuse prevention programs (Euser et al., 2015; van der Put et al., 2018), which traditionally emphasize psychoeducation and modifying cognitions. Moreover, current findings were observed after statistically controlling for income and employment loss due to the pandemic, suggesting these effects are robust beyond demographic covariates that were particularly salient during the pandemic.

Data also indicated that mothers' perceptions that their aggressive responding and neglect since the start of the pandemic were significantly related to standard measures of child maltreatment risk, similar to findings from early in the pandemic (Rodriguez, Lee et al., 2021). The fact that these relations continued to appear six months into the pandemic suggest that maltreatment risk remained elevated, rather than parents acclimating to the pandemic circumstances. In addition, more than one in ten mothers believed they were engaging in more physical aggression and more than one in five were engaging in more psychological aggression since the start of the pandemic; nearly one in eight were leaving their children home alone more often. Given that parents routinely under-report their abuse and neglect of their children (Sedlak et al., 2010; Stoltenborgh et al., 2015), the extent of maltreatment risk posed to children during the pandemic reflects concerning levels.

## Strengths and Limitations

Given the social distancing requirements during the pandemic, the current study was limited to an online survey methodology, although this strategy did permit mothers to respond anonymously, reducing typical social desirability concerns derived from self-reports. Our cross-sectional design means causality cannot be inferred from this study with regard to the relations between maternal emotion and maltreatment risk. We were able to demonstrate that mothers' perceptions of pandemic-related parenting changes in physical and psychological aggression aligned with their report of these behaviors on the CTSPC. However, this study only inquired about perceived increases in neglectful behavior within the COVID-19 questions on perceived changes in parenting but did not administer the neglect items from the CTSPC because many of those CTSPC items are seldom endorsed; thus, future research could expand the focus on neglect. Only mothers were invited to participate in this study; thus, we continue to have less insight into the child maltreatment risk and parenting experience of fathers during the pandemic (cf. Lee, Ward, Lee et al., 2021; Rodriguez, Lee et al., 2021). Although this study involved a racially diverse sample, the study was conducted in the U.S. and may not reflect the perceptions of parents experiencing the pandemic in other countries.

## Additional Implications and Recommendations

Concerns have emerged that the pandemic has contributed to a mental health crisis in the U.S. and across the globe. For many parents, generalized worries may contribute to elevated levels of clinical anxiety. During the COVID-19 pandemic, there has been a three-fold increase in generalized anxiety disorder levels among adults in the U.S. (Twenge & Joiner, 2021). Parents have reported concerns related to economic hardship as well as their child's health and safety, education, and wellbeing (APA, 2020; Lee, Ward, Chang et al., 2021; Patrick et al., 2020). The current findings suggest that parental anger and worry about children's behavior in particular may be a source for this increased child maltreatment risk. Thus, there is a tremendous need to provide support and resources to parents who are experiencing elevated emotional distress.

A number of strategies could be utilized to help parents address their worries including online platforms that provide educational resources to parents as well as to health care providers; professionals and parents alike need to recognize the importance of acknowledging and validating parental distress, as well as other risk factors for maltreatment (Kimber et al., 2020). Organizations like the American Academy of Pediatrics (healthychildren.org) and the American Psychological Association (apa.org/topics/covid-19) provide a robust set of evidence-based resources to parents to help them address common concerns about parenting during the pandemic, such as strategies parents can use to encourage children to use face masks to safeguard children's health

and safety. Both sites provide concrete strategies for parents to use to manage stress during the ongoing strain of the COVID-19 pandemic. Health care providers and other professionals can use these existing resources to counsel parents directly or remotely.

The current study suggests both maternal anger and worry about their child's behavior were related to mothers' increased risk for child maltreatment during the COVID-19 pandemic. During the stressful conditions precipitated by the pandemic, strong evidence indicates that U.S. adults overall (Twenge & Joiner, 2021) and parents in particular (APA, 2020; Lee, Ward, Chang et al., 2021; Patrick et al., 2020) experienced a host of concerns that contributed to elevated levels of anxiety. Online resources and direct parent education from professionals may help to alleviate common parenting worries about child behavior and improve their anger management. Screening parents for clinical levels of distress may be an important strategy to ultimately support the entire family. For practitioners working individually with parents, directly addressing their anger and fears explicitly about their children's behavior may represent an opportunity for parents to practice strategies to manage such negative affective reactions to challenging child behavior.

## Declarations

**Conflict of interest** The authors declare no conflicts of interest.

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