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Impact of the COVID-19 Pandemic on Child Anxiety Symptoms: The Influence of the Caregiver-Child Relationship

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Impact of the COVID-19 Pandemic on Child Anxiety Symptoms: The Influence of the Caregiver-Child Relationship

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Abstract

Research suggests that youth are dealing with a myriad of worries during the COVID-19 pandemic (Ellis et al., 2020), which highlights the need for investigations focused on child anxiety. However, to date little research has examined children's anxiety in the COVID-19 pandemic nor the potential protective effects of the caregiver-child relationship. Therefore, this research aimed to contribute to the literature by investigating the influence of COVID-19 related stressors in younger children and leveraging children's report of their own attachment security within their relationship with their caregiver and mental health. The current study used a national, quantitative survey of young children (ages 8-12 years; $N = 90$) and their primary caregivers (parent or legal guardian; $N = 90$) to investigate the link between pandemic-related stressful events and circumstances and child anxiety as well as the moderating role of caregiver-child attachment security. Findings suggest that (1) pandemic-related stressful events and circumstances were not related to child anxiety scores (i.e., total and subtypes) and (2) caregiver-child attachment security did not moderate the relationship between stressful pandemic-related experiences and child anxiety scores. However, preliminary analyses indicated that anxiety levels were higher than in previous community samples (assessed prior to the pandemic) and that higher caregiver-child attachment security was associated with lower anxiety levels. Thus, preliminary findings indicate a possible cohort effect for child anxiety during the pandemic and underscore the importance of stability and relationship security within the household during pandemic quarantine. This research could inform future studies on child anxiety during the COVID-19 pandemic.

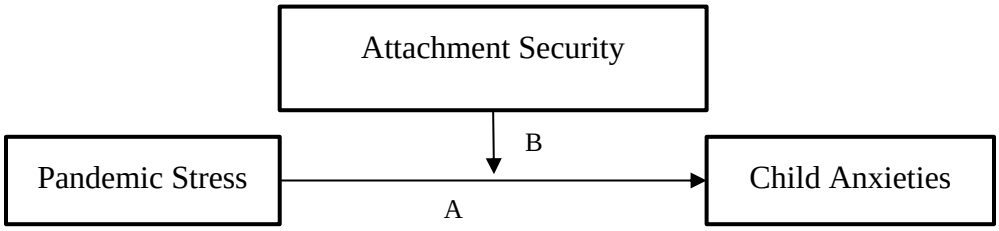
Introduction

The coronavirus (COVID-19) outbreak was declared a pandemic in March 2020 by the World Health Organization. It was an ongoing public health crisis, with 77,592,5982 cases and 916,977 deaths confirmed as of 02/15/2022 in the United States (Centers for Disease Control and Prevention, 2022). To limit virus exposure, the public was required or strongly advised to practice containment measures (physical distancing from non-household members, school closures, remote work, etc.). These drastic changes to daily life have created significant socio-emotional stress and negatively affect mental health for children and families (Brooks et al., 2021; Imran et al., 2020; Phelps & Sperry, 2020). As such, this pandemic environment may play a key role in the mental health of some children (Cobham et al., 2016) and influence family interactions (Courtney et al., 2020).

Emerging research from the COVID-19 pandemic indicates associations between COVID-19 related stressors and child mental health (Jiao et al., 2020; Oosterhoff et al., 2020; Rosen et al., 2020; Zhou et al., 2020). However, studies have disproportionately involved adolescents, relied on caregiver-report, and have focused on anxiety broadly. Therefore, this study contributes to the literature by investigating the influence of COVID-19 related stressors in younger children and leveraging children's report of their own family functioning and mental health. More specifically, the link between pandemic-related family stress and child anxiety as well as the potential protective role of the caregiver-child attachment security (Figure 1). This study also adds to anxiety literature by examining subtypes of anxiety (i.e., generalized, panic/somatic, separation, social, and school avoidance) and exploring whether they are differentially associated with pandemic stress.

Figure 1

Model



Pandemic Stress

Child exposure to potentially stressful pandemic-related experiences is one way in which children's mental health may be undermined during the pandemic (Figure 1, Path A). Emerging evidence suggests that the pandemic was a time of heightened stress, fear, and worry for children and families (Ellis et al., 2020). According to The Harris Poll, adults in the United States experienced higher levels of stress within a year of the start of the COVID-19 pandemic, and 81% of them attributed their source of stress to the coronavirus; adults reported feelings of anxiety (47%), sadness (44%), and anger (39%) as a byproduct of their stress (American Psychological Association; APA; 2021). It is likely that confinement-related stress was also taking a toll on families. For example, in a recent study focused on Canadian adults, over 30% reported feeling extremely concerned about confinement-related family stress and over 40% reported extreme concern about their ability to cooperate and support one another during the crisis (Statistics Canada, 2020).

The chronicity of the pandemic and resultant social isolation is another set of factors to consider when understanding the influence that the pandemic has on families, and particularly child mental health. To date, the pandemic has been nearly a two-year global health concern that has transformed former ways of living, socializing, and working for families. These ongoing changes highlight the relevance of chronic stress (i.e., the subjective experience of a prolonged negative state of relative disadvantage; Kopp et al., 2007) and social isolation (i.e., resultant

loneliness from social distancing; Kim & Jung, 2021), throughout the ongoing and unrelenting health crisis. When confronted with stressful changes in social and physical environments, the brain adapts by altering the neural circuitry responsible for cognition, decision making, mood, and anxiety (Marin et al., 2011). These alterations are intended to be temporary, however, in events when the stressful changes are chronic (e.g., pandemic), the alterations in neural circuitry become permanent and result in maladaptive and unhealthy behavioral responses, such as anxiety (McEwen, 2018). Social isolation can exacerbate the effects of stressful events by heightening a person's sensitivity to the threat, creating a need for requited social connections, and compromising mental health (Cacioppo & Cacioppo, 2014). Particularly for children and families, studies that have been conducted during the pandemic thus far have linked chronic stress and social isolation with poor mental health outcomes (Mautong et al., 2021; Morgül et al., 2020; Qi et al., 2021; Torres González et al., 2020).

From a family systems theory perspective (Carr, 2015), the family is a social system that is ancillary for the survival and welfare of its members. The social system is dependent on the relationships and interactions among its members. Within the family system, there are processes that promote and prevent change. To facilitate adaptation, the family needs the resources to adjust to new demands and changing circumstances. COVID-19-related stressors obstruct the functioning of individuals, which may alter family functioning and influence child psychological adjustment or maladjustment. As such, children will be directly affected by the stress of the pandemic (e.g., fear of infection, loss of school), and will also be indirectly affected as they are exposed to the pandemic-related stress - and resultant behavioral changes - of other family members, especially those living at home with them. Major disasters, such as the COVID-19 pandemic, are challenging to family members, which can damage relationships (e.g., martial and

caregiver-child) and promote negative effects on mental health for all family members (Zhou, 2020). This is particularly relevant because in a family system, the primary caregiver creates an environment for their family through their interactions with family members, and due to pandemic-related stress, that environment was compromised by the distress experienced by the caregiver. This creates a chain reaction in the home environment and exposes the child to a secondary trauma that will lead to persistent or delayed onset of distress symptoms (Zhou, 2020).

For example, pandemic-related unmet financial obligations and foregone social support significantly increased reported family stress and domestic violence (Béland et al., 2021), which can have lasting implications on family functioning and child mental health. Moreover, caregivers experienced innumerable stressors related to loss (e.g., personal freedom, employment, financial stability, loved ones), increased responsibility (e.g., reduction of social support outside of the home, added childcare responsibilities) and deteriorating mental health as a result of the pandemic (Brooks et al., 2021; Prime et al., 2020). Brown et al. (2020) adds that parental internalizing symptoms and COVID-19-related stressors are associated with higher caregiver stress. Spinelli et al., (2020) extended this notion to suggest that caregivers who experienced more difficulty during the quarantine showed more stress, which in turn, undermined parental and child well-being. As such, this undercuts the caregiver's ability to address their child's distress and amplifies the risk of the pandemic becoming traumatic for children with perdurable emotional repercussions (Courtney et al., 2020).

Moreover, when caregivers do not have the emotional bandwidth to protect their children from stress, they may, consequently, create an environment in the household that is reflective of their distress, which may impact children's functioning. For example, findings indicate that family stressors such as traumatic events, parental conflict, poverty, low social support, and

parenting hassles are linked to children's internalizing problems (Sheidow et al., 2014). Findings also suggest that children who have experienced a stressful life event in the recent past are more likely to be diagnosed with an anxiety disorder (Gothelf, 2004; Platt et al., 2016; Tiet et al., 2001) and that caregiver stress can influence the relationship between stressful life events and child anxiety severity (Platt et al., 2016). Thus, the outcomes of macro-level stressors, such as the stressful life events associated with a community-wide pandemic, on children are likely to be partly a function of the stressor and partly a function of how the stressor affects the family (Masten & Motti-Stefanidi, 2020). This notion is further explained by the family stress theory. The theory posits that outcomes of family stress result from interactions among the macro-level stressor event, resources available to the family, and meaning caregivers placed on the stressor which influences how caregivers communicate the stressor to their family (Hill, 1949; Xu & Wu, 2020). Adapted to the current study, emphasis is on the outcome (e.g., child anxiety) as a function of the influence of the macro-level stressor event given family resources (e.g., stressful COVID-19 pandemic-related experiences on the family) and how the stressor is interpreted and discussed - and the meaning of it - within the family (e.g., as conveyed via the caregiver-child attachment security).

Caregiver-Child Attachment Security

One way in which the family may serve as a protective factor for children's mental health during the pandemic is in the quality of the caregiver-child attachment security (Figure 1, Path B). Child mental health is markedly influenced by their caregivers and home environment. Attachment theory (e.g., Bowlby, 1973) suggests that the way a child is treated by their caregiver influences how they behave, feel, and think in future stressful situations. Moreover, attachment theorists emphasize that the contribution of sensitive and responsive caregiving fosters the

child's capacity to recognize and understand their emotions, self-regulate in times of distress, and trust in caregiver abilities (Ainsworth, 1989; Sroufe et al, 1999). Sensitive and responsive caregiving to child emotional expression teaches the child that their emotions will not overwhelm the caregiver, thus creating an environment in which the child can share thoughts, fears, and worries (Sroufe, 1995), leading to positive mental health outcomes (Kerstis, 2018). Secure attachment caregiver-child relationships bolster the development of adaptive coping (Compas et al., 2017) and self-regulatory capacities that render children capable of effectively managing their distress following stressful life events, particularly during the pandemic (Coulombe & Tuppett, 2021).

Positive parenting, marked by responsiveness, communication, trust, and warmth, fosters an environment in which the child feels secure in their caregiver's availability and predictability of survival-related resources as well as ameliorates the likelihood of a psychopathological disorder (Bosmans & Kerns, 2015; Doom & Cicchetti, 2018; Gullone & Robinson, 2005; Santrock, 2007). In the positive parenting home environment, caregivers serve as a safe haven for their children in times of stress and may buffer the effects of a stressful life event, including the COVID-19 pandemic (McLaughlin et al., 2010; Platt, 2016, Steele, 2020). On the other hand, homes with a higher frequency and/or intensity of negative parenting behavior, such as aggression, punitive discipline, inconsistency, and lack of warmth and involvement (Stormshal et al., 2000), are predictive of anxiety disorders as the caregiver is not perceived as a mechanism for safety and support. This undermines a child's perception of control and increases cognizance of threat in a stressful environment (Hudson & Rapee, 2004), fosters child emotional distress (Bayer et al., 2006), and hinders the child's ability to cope during current and future stressful situations (Prime et al., 2020).

Although the caregiver-child attachment security is stable over time, a stressful life event, such as an act of terrorism, a natural disaster, pandemic, etc., may disrupt the relationship's harmony, impacting the typical dynamic and quality, expected behaviors in the relationship, and child mental health (Cobham & McDermott, 2014; Maclean et al., 2016). For example, in a study that investigated parenting as a predictor of child posttraumatic stress syndrome related to the 9/11 terrorist attacks in the United States, results indicated that high levels of child stress were positively associated with caregivers who reported patterns of anxious communication (e.g., being too upset to engage the topic, not knowing what to say) when talking about the event (Wilson et al., 2010). Moreover, in studies focused on the aftermath of Hurricane Katrina, results showed that caregivers were more likely to engage in maladaptive coping. In turn, these caregivers demonstrated a change in their parenting and were more likely to use corporal punishment (Kelley et al., 2010). Additionally, compared to pre- and post-Katrina, children displayed higher levels of anxiety when levels of trust and communication in the caregiver-child relationship were low (Costa et al., 2009). Further, in an analysis of caregiver's perceived change in parenting and child posttraumatic stress symptoms following a natural disaster, Cobham & McDermott (2014) found a strong association between caregiver intrusive cognitions (i.e., thoughts about the event) and change in parenting (i.e., granting less child autonomy, stressing the need to be careful, or greater protectiveness), indicating that those caregivers who reported intrusive cognitions changed their parenting practices as a result of the natural disaster. In summation, empirical evidence shows that negative parenting styles, anxious conversation surrounding the disaster, caregiver-child attachment security in the relationship, and change in family functioning can increase a child's vulnerability post-disaster (Cobham et al., 2016).

When faced with stressful events and circumstances, children look to their caregivers for how to process and respond to the threat and resultant emotions (Davies & Cummings, 1994). As such, these are particularly salient times in which children are sensitive to the emotional states of their caregivers (Winter et al., 2011), particularly given the increase in family time and decrease in time with other sources of social support that the pandemic lockdown resulted in for many children (Xu & Wu, 2020). The COVID-19 pandemic has provided unprecedented challenges for families in terms of structural shifts in normative routines (e.g., family, working, and learning environments), financial insecurity, caregiver burden, and confinement related stress (Fong & Iarocci, 2020; Prime et al., 2020). Families from historically marginalized groups in particular, have experienced disproportionate impact of the pandemic, including increased risk of infection and mortality (Albrecht, 2022; CDC, 2020; Fortuna et al., 2020; Magesh et al., 2021; Sonu et al., 2021). Moreover, relationships have been compromised (e.g., difficulties, conflict, and violence; Feeney & Fitzgerald, 2022), predicting less stable and cohesive family environments (Overall et al., 2021) and poor mental health outcomes (Vowels et al., 2021) particularly for families with poorer attachment quality. These added stressors may increase the overall caregiver burden, and as a result, alter the caregiver-child attachment security. This is not uncommon, as caregivers are more likely to display lower levels in warmth and sensitivity as a result of distress (Bayer et al., 2006), which in turn may serve as a risk factor for child generalized anxiety disorder (Kerns & Brumariu, 2013). Although anxiety symptomatology can be managed through quality caregiver-child relationships founded on trust, involvement, and communication (Rostad & Whitaker, 2016), caregivers are compromised and overburdened by pandemic-related stressors. In a time of ambiguity, fear, and worry, children would benefit from responsive caregivers, however, this may not be possible for some families given the circumstances of the COVID-19 pandemic.

Therefore, it is important to investigate how COVID-19 related stressors may influence caregiver-child attachment security.

Child Anxiety in Middle Childhood

Anxiety disorders represent one of the most common forms of psychopathology in middle childhood, with resultant impairments in psychosocial functioning, peer relationships, and academic performance (Feng et al., 2008). Developmentally, children in middle childhood (ages 8-12 years) are experiencing a shift in their cognition, motivation, social behavior, and environments. Cognitively, they have developed an increased ability in attention span, perspective-taking, problem-solving, reasoning skills, and working memory capacity (DelGuidice, 2018). Motivationally and social-behaviorally, children consider the feelings of others, develop morality in terms of what is right and wrong, self-regulate to control their emotions, engage in prosocial behavior to promote social acceptance, understand social hierarchies, and accept responsibility (DelGuidice, 2018, Mah & Ford-Jones, 2012). Environmentally, they begin to face more academic challenges at school and are highly influenced by peers, caregivers, and other authority figures in their immediate environments (Capuzzi & Stauffer, 2016). As such, these developmental milestones work synergistically to influence how children will interact with the world and can influence susceptibility to psychopathological onset (DelGuidice, 2018).

Middle childhood is also highlighted in the literature as a sensitive period for brain development in children. During this time, the brain is undergoing synaptic pruning, a refinement process in which parts of the brain are selectively enhanced, maintained, or weakened. This process is determined by everyday experiences and the child's environment. As such, exposure to certain environments can alter a child's epigenetics and how they may perceive the world,

which in turn has implications for a child's brain activity and behavioral responses (Mah & Ford-Jones, 2012). Early stress experiences may translate into increased reactivity to threat and conflict as well as contribute to the development of psychopathological disorders (DelGuidice, 2014; Fiese et al., 2019). For example, a study investigating threat response in middle childhood found that greater child dysphoria was associated with increased startle response to threat and these findings remained even after controlling for anxiety symptoms (Borelli et al., 2011). This hyperarousal to threat can work together with attention control (ability to organize stimuli, remain calm, tolerate change, and create cognitive and behavioral responses) to compromise child self-regulation and coping behaviors as well as increase anxiety levels (Muris et al., 2007).

Empirical evidence suggests that children who have lived through natural disasters are at an elevated risk for developing psychopathological disorders, such as anxiety, that may persist through adulthood (Maclean et al., 2016; Neria & Shultz, 2012; Norris et al., 2002). The coronavirus pandemic may have similar implications for children and their development. COVID-19 has exacerbated anxiety by making children feel fearful, vigilant, and threatened, which heightens their anxiety, and in turn, makes children more at risk for anxiety disorders (Jiao et al., 2020). Additionally, pandemic preventative measures confined many families to the home and disrupted the typical environment, to which may also contribute to child anxiety disorders (Feng et al., 2008; McLaughlin et al., 2010). Although empirical studies to date are scarce and international findings may not generalize to the United States pandemic experience, emerging evidence from studies in China suggest that children and adolescents experienced elevated anxiety during the pandemic (Chen et al., 2020; Duan et al., 2020) and that anxiety levels are higher for certain children (e.g., females and those who are left home without caregiver companionship during the weekdays; Chen et al., 2020). Similarly, a study that spanned across

Italy, Portugal, and Spain suggested that anxiety symptoms (38.1%) were observed more often in children whose parents reported higher levels of stress (Orgiles et al., 2021). Studies in Canada and Germany found that sources of stress and worry for adolescents included the COVID-19 crisis itself as well as developmentally salient domains of adolescence (e.g., schooling and peer relationships; Ellis et al., 2020; Ravens-Sieberer et al., 2021). In a recent study examining pandemic stress in United States children of varying ages, stress was elevated. For children in elementary and middle school, common stressors included not seeing friends in person, fear that family or friends might get sick, as well as difficulty concentrating and falling behind on schoolwork (Styck et al., 2021). Specifically, to middle childhood, one study in Spain presented medium (66.9%) to high (67.9%) scores on anxiety (Lavigne-Cervan et al., 2021). Two studies reported on longitudinal data, finding that German youth experienced higher levels of anxiety compared to those before the pandemic (24.1% vs. 14.9%; Ravens-Sieberer et al., 2021) and that United States youth (47.4%) reported anxiety scores that were 5 standard deviations greater than values from similar youth populations prior to the pandemic (Alves et al., 2020). Overall, in a systematic review and meta-analyses that examined global results of child anxiety during the pandemic, pooled estimates suggested that between 20.5% to 34.5% of children are suffering from anxiety (Racine et al., 2021; Panda et al., 2021). These results doubled pre-pandemic levels as currently 1 in 5 children are presenting anxiety symptoms (Racine et al., 2021).

Although emerging literature is considering the impact of the pandemic and the saliency of anxiety at certain ages, current studies of anxiety in children during COVID-19 are limited in that they have largely focused on caregiver-report and only looked at anxiety broadly, focusing on overall symptom levels. It would be advantageous to leverage child-report and to identify, specifically, which subtypes (e.g., generalized, panic, separation, social, school avoidance) of

anxiety are heightened for children during the pandemic. Overall symptom levels of anxiety are a starting point, but insufficient in addressing developmental impact. Anxiety subtypes impair child functioning differently and children may also be increasingly susceptible to these subtypes considering the specific domains of stress and worry elicited by this pandemic. Thus, while COVID-19 could be contributing to cumulative trauma for many children across the country and increasing the likelihood of developing anxiety symptoms and disorders in the future (Karam et al., 2014), no study to date has identified sources of the subtypes of anxiety in young children nor children in the United States. By more closely examining the subtypes, one can have a greater understanding of the child's experience, how these symptoms may affect ongoing development, and identify methods of prevention and intervention for this age group.

In general, anxiety disorders are characterized by excessive fear- (emotional response to threat) and anxiety- (anticipation of future threat) related behavioral disturbances (American Psychiatric Association, 2013). Anxiety disorders develop as early as childhood and as children approach adolescence, sex differences may emerge (Beesdo, et a., 2009). Therefore, it is important to consider the roles of sex and age. Anxiety disorders can manifest into different subtypes, such as generalized anxiety, panic/somatic disorder, social anxiety disorder, separation anxiety disorder, and school avoidance-related anxiety.

Generalized anxiety disorder is marked by chronic worry about every day, routine events that interfere with attention to tasks and is difficult to control. Children typically worry excessively about their competence or quality of their performance (e.g., activities, school). This may result in unexpected panic attacks, which are somatic symptoms associated with panic disorder such as accelerated heart rate, shortness of breath, sweating, trembling, etc., and generally pertain to physical (e.g., life threatening illnesses) or social (e.g., fear of being judged)

concerns. As such, this may be relevant to children when engaging with others outside of their household due to the limited exposure, significant change to their environment, and methods of interaction (e.g., distancing, masks, mindful of others' exposure to the virus) in the past year.

Other subtypes of anxiety that might be particularly salient during the pandemic are separation anxiety, social anxiety, and school avoidance. As a function of COVID-19 and confinement-related measures, such as over a year-long quarantine with household members, children may be vulnerable to anxiety subtypes that include varying degrees of socialization. Separation anxiety is typified by fear or anxiety about separation from attachment figures (i.e., parents, caregivers) that is developmentally inappropriate. Separation anxiety is most common in children (Bandelow & Michaelis, 2015) and given the increase in time spent with the family as well as worries concerning the pandemic and infection, this may be increasingly prevalent in middle childhood. On the other hand, it could be that children are protected from symptoms of separation anxiety for similar reasons. Social anxiety can be described as fear and anxiety about or avoidance of social interactions such as meeting unfamiliar people, being observed, or performing. The child may fear embarrassment, humiliation, or rejection with those they interact with, whether that be an adult or peer. As onset for social anxiety begins in middle childhood, this may be particularly relevant, especially in tandem with the pandemic containment measures that have kept children isolated from peers as well as the general public. School avoidance refers to anxiety associated with the school setting and is often linked with generalized anxiety disorder as well as separation anxiety. Anxiety in the classroom can undermine child attention, concentration, working memory, and ability to learn (Hashempour & Mehrad, 2014; Owens et al., 2012). This may result in absenteeism as the child aims to avoid confronting poor academic performance, bullying, or victimization (Sobba, 2018).

These anxiety subtypes are particularly relevant for children during the pandemic as many children have experienced changes to their environments and relationships such as social isolation from peers and other adult authority figures, remote learning, and increased time with the family under unanticipated and stressful circumstances. These changes may undermine child development because their environment may limit the growth, experience, and exposure children would have typically received outside of a pandemic. Since this is a developmentally impressionable and socially vulnerable time for children, it is important to investigate how COVID-19 related stressors and confinement may pose a risk for developing elevated anxiety symptoms and how family relationships can help buffer that risk.

Current Study

The goal of this research was to investigate how the COVID-19 pandemic stressors were associated with child anxiety as well as the caregiver influence on mitigating child anxiety symptoms (Figure 1). Given the paucity of research on children (as opposed to adolescents) and the general reliance in the emerging COVID-19 literature on caregiver report, this study is unique in its focus on middle childhood ages 8-12 years and reliance on children's self-reported COVID-19-related anxiety symptoms. Moreover, this study extended beyond current measures of generalized anxiety to consider subtypes of anxiety that may be most heightened as a result of the distinctive COVID-19 preventative measures and circumstances.

Aims and Hypotheses

Aim 1. Aim 1 examined whether stressful pandemic-related experiences was associated with child anxiety symptoms (Figure 1, Path A) over and above the effects of any covariates, including anxiety diagnoses and stressful life events (i.e., adverse childhood experiences; ACEs) prior to the pandemic. *Hypothesis 1*: Greater pandemic stressor exposure will be associated with

greater child anxiety symptoms. The pandemic has created different and challenging household environments for children and families (e.g., remote, hybrid, or distanced in-person learning/working, social distancing, financial insecurity, fear of exposure). This, along with other contributing pandemic-related stressors have implications for children's anxiety, which may put children at an increased risk for elevated anxiety symptoms. This study tested associations between stressful pandemic-related experiences and child anxiety total symptom scores and subtypes: generalized anxiety disorder, panic/somatic disorder, separation anxiety disorder, school avoidance, and social anxiety disorder. Given that the literature has yet to examine the differential impact, the investigation of anxiety subtypes was exploratory, and no specific hypotheses were proposed.

Aim 2. Aim 2 examined the interactive influence of stressful pandemic-related experiences with the dyadic (i.e., caregiver-child attachment security) factor on child anxiety symptoms (Figure 1, Path B) over and above any effects of covariates, including anxiety diagnoses and stressful life events (i.e., adverse childhood experiences, or ACEs) prior to the pandemic. *Hypothesis 2:* The interaction of pandemic stress and caregiver-child attachment security will be associated with child anxiety symptoms, such that the deleterious effects of pandemic stress will be buffered in the context of high caregiver-child attachment security. When faced with stressful events and circumstances, children look to their caregivers for how to process and respond to the threat and resultant emotions (Winter et al., 2011). These are particularly salient times in which strong caregiver-child attachment security may buffer anxiety symptoms by fostering the trust and communication (Gullone & Robinson, 2005) necessary to encourage children's asking for help, sharing information, and discussing pandemic related concerns and fears. Thus, the pandemic was a critical time in which the quality of the caregiver-

child attachment security may mitigate the risk of stressful pandemic-related family experiences to child anxiety symptoms.

Method

Participants

The study utilized data from the IRB-approved Families Adapting to COVID-19 Together (FACT) study. The FACT study was a roughly representative sample of the United States population in terms of race and ethnicity. The inclusion criteria for the family included being residents of the United States and able to read, speak, and write in English well enough to complete surveys independently. Children were required to be between the ages of 8 and 12 years (middle childhood) and have received parental permission/consent for participation. Adult caregivers were required to be the legal authorized guardian of a child between 8 and 12 years and live with the child at least half of the time. If the caregiver had multiple children within the same age range, they were instructed to randomly choose one child.

Adult/caregiver participants were excluded if they did not have a child between 8 and 12 years, did not provide permission/consent for child participation, could not complete questionnaires independently in English, lived outside of the United States, and/or someone from their immediate family (e.g., second parent and a different child) or same IP address had already participated in the study. Exclusion criteria for children included their caregiver being excluded, being younger than 8 or older than 12 years, being unable to complete surveys independently in English, and/or not receiving caregiver permission/consent to participate.

The sample for the study included 90 children ages 8 to 12 years (*M*age = 9.92; *SD* = 1.33 years; 53.3% female) and 90 of their primary caregivers (i.e., parents or legal guardians; *M*age = 36.2; *SD* = 6.17 years; 67.8% female) who met inclusion criteria. The sample was

ethnically diverse but majority White (non-Hispanic/Latinx): 58.9% of children identified as White (*n* = 53), 15.6% as Black or African American (*n* = 14), 11.1% as Hispanic/Latinx (*n* = 10), 3.3% as Asian (*n* = 3), 2.2% as American Indian or Alaskan Native (*n* = 2), 1% as Native Hawaiian or Other Pacific Islander (*n* = 1), and 7.8% as multi-racial (*n* = 7). School was in-session for approximately 77.8% of children (*n* = 70) and 50% of children reported their most recent learning modality as in-person (*n* = 45), 23.3% as hybrid (in-person and remote combination; *n* = 21), 18.9% remote (*n* = 17), and 7.8% as homeschooled (*n* = 7). Of the child primary caregivers, approximately 1.1% reported less than a high school level of education (*n* = 1), 12.2% received a high school diploma or GED (*n* = 11), 34.4% received some college or technical training (*n* = 31), and 52.2% received a bachelor's or graduate degree (*n* = 47). Median household income for the child's primary caregiver was $45,000-49,000 (*M*income = $60,000-64,000, *SD* = 10.31). The majority (65.6%) of child's primary caregivers identified as biological mothers (*n* = 59) and 91.1% lived with either a spouse or partner (*n* = 82; see Table 1).

Table 1

Sample Demographics (N = 90)

Demographic Variable	**Mean (SD) or % (n)**
Child sex (female)	53.3% (48)
Child age in years	9.92 (1.33)
Child's race/ethnicity	
American Indian or Alaskan Native	2.2% (2)
Asian	3.3% (3)
Black/African American	15.6% (14)
Hispanic/Latino	11.1% (10)
Native Hawaiian or Other Pacific Islander	1.1% (1)
White/non-Hispanic	58.9% (53)
Multi-racial	7.8% (7)

Child school modality	
Attended school at data collection	77.8% (70)
Homeschooled	7.8% (7)
Hybrid	23.3% (21)
In-person	50% (45)
Remote	18.9% (17)
Child prior anxiety diagnosis (yes)	5.6% (5)
Child prior ACEs	
Zero reported ACEs	74.4% (67)
One reported ACEs	13.3% (12)
Two reported ACEs	5.6% (5)
Three reported ACEs	2.2% (2)
Four reported ACEs	1.1% (1)
Five or higher reported ACEs	3.3% (3)
Primary caregiver's age	36.2 (6.17)
Primary caregiver's gender (female)	67.8% (61)
Primary caregiver's living situation	
Living with spouse or partner	91.1% (82)
Living without spouse or partner	8.9% (8)
Primary caregiver's education	
< High School diploma	1.1% (1)
High School diploma or GED	12.2% (11)
Some college, technical education	34.4% (31)
College or graduate degree	52.2% (47)
Primary caregiver's household income	$60,000-64,000 (10.31)
Primary caregiver's relationship to child	
Biological father	32.2% (29)
Biological mother	65.6% (59)
Other (legal guardian or stepparent)	2.2% (2)

Procedure

Participants were recruited between the months of July and November 2021, using snowball and targeted sampling strategies which linked interested adults to the online study administered through Qualtrics (https://www.qualtrics.com). For survey and participant security, Qualtrics security features were utilized to assign each family a unique ID number. Caregiver

participants completed a screener for eligibility and those who met inclusion criteria were linked to a caregiver (i.e., parent or legal guardian) consent/permission form for their own participation and for their child's participation. Upon consent, caregiver and child were directed to independently complete a battery of psychometrically established questionnaires. To minimize burden, participants could save and return to the survey later. Caregiver-child dyads were compensated $25 (Amazon.com e-gift card) for their time. The caregiver was also prompted to indicate whether they would like to be contacted regarding possible participation in future studies. Following recommendations for collecting valid data online, numerous strategies were implemented to ensure data integrity: careful recruitment, CAPTCHA, index prevention, self-designated family passwords and ID numbers, direct emailing for reimbursement, flagged suspect responses, records of IP addresses, participation times, browser use, data monitoring, attention checks, as well as open-ended, reverse-coded, and screening questions (Shockley et al., 2021; Yattish et al., 2019).

Measures

Demographics and Covariates

Caregivers reported their highest level of education, total family income, and their relationship to the child. They also reported the following child descriptors: age, race, and sex. The potential caregiver covariates included the highest level of education (0 = no college degree and 1 = associate degree or higher), total family income, and their relationship to the child. The potential child covariates included age, race, sex (0 = male and 1 = female), ACEs (0 = not experienced and 1 = yes experienced) and anxiety diagnosis (0 = no prior anxiety diagnosis and 1 = prior anxiety diagnosis) prior to the pandemic, whether school was in-session (0 = school not in-session and 1 = school in-session), and current school format (0 = remote or in-person and 1 =

hybrid or homeschool). School format was dichotomized for analysis based on patterns in mean differences: remote and in-person groups had higher mean levels of anxiety compared to hybrid and homeschool groups. ACEs (Crouch et al., 2019; Appendix D) were assessed using a 9-item caregiver-report of their child's pre-pandemic lived experiences. All affirmative responses were summed to form an overall index in which higher scores indicated greater ACEs.

Epidemic-Pandemic Impacts Inventory

Stressful pandemic-related experiences were assessed using the Epidemic-Pandemic Impacts Inventory - Brief Form (EPII; Grasso et al., 2020; see Appendix A). Caregivers completed a 30-item self-report scale and indicated whether any items were true to their experience during the pandemic (0 = no and 1 = yes). The two items that reflected positive change were removed (i.e., items 28 and 30). The remaining 28 items were summed to form an overall index of pandemic stress. Higher scores indicated greater stress. Since this measure is a checklist of distinct and diverse experiences and exposures, internal consistency scores are not appropriate and are therefore not reported.

Inventory of Parent and Peer Attachment-Revised for Children

Caregiver-child attachment security was assessed using the parent subscale of Inventory of Parent and Peer Attachment-Revised for Children (IPPA-R; Gullone & Robinson, 2005; see Appendix B). Children completed a 28-item self-report scale and rated their agreement with the series of statements on a 3-point Likert scale ranging from 1 (never true) to 3 (always true). Necessary items, as indicated on scoring instructions, were reverse scored. Next, items were summed into a total score. Higher scores indicated greater overall psychological security in the relationship. Measure reliability and validity have been established with children (Cronbach's alpha = 0.76 - 0.79). In this sample, internal consistency was adequate (α = .75).

Screen for Child Anxiety Related Emotional Disorders

Child anxiety was assessed using the Screen for Child Anxiety Related Emotional Disorders (SCARED; Behrens et al., 2019; see Appendix C). Children completed a 41-item self-report scale and rated their agreement with the series of statements on a 3-point Likert scale ranging from 0 (not true or hardly ever true) to 2 (very true or often true). Items were summed into total and subscale scores: *panic disorder or significant somatic symptoms* (e.g., When I get frightened, I sweat a lot), *generalized anxiety disorder* (e.g., I am a worrier), *separation anxiety* (e.g., I don't like to be away from my family), *significant school avoidance* (e.g., I am scared to go to school), and *social anxiety disorder* (e.g., It is hard for me to talk with people I don't know well). Higher scores indicated more anxiety symptoms. Measure reliability and validity have been established with children (Cronbach's alpha = 0.87). In this sample, internal consistency was adequate for total score (α = .95), panic disorder or significant somatic symptoms (α = .93), generalized anxiety disorder (GAD; α = .85), separation anxiety (α = .71), social anxiety (α = .85), and school avoidance (α = .77)

Data Analysis

An a priori power analysis was conducted to determine the estimated sample size for data analysis using G*Power software (v.3.1; Faul et al., 2009). For each moderator model, 10 participants per predictor (independent, covariate) variable were needed for adequate power (Wilson VanVoorhis & Morgan, 2007). To determine a medium-sized effect (eta^2 = .15) with an expected power of 0.80, a minimum sample of 68 participants was required. A series of six hierarchical regression models were run to determine whether greater pandemic stress was associated with higher scores on each child anxiety scale above and beyond the effects of covariates and to determine the moderating effect of caregiver-child attachment security.

Results

Descriptive Statistics and Preliminary Analyses

IBM SPSS software version 27 was used for descriptive statistics (i.e., means, standard deviations, and ranges) for age, caregiver-child attachment security, pandemic stress, and child anxiety symptoms as well as frequencies for sex and race. Data were cleaned and distributions were examined for univariate and multivariate outliers, residual normality, linearity, homoscedasticity, multicollinearity, skewness, and kurtosis. No outliers were detected as all values for continuous variables fell within the range of three standard deviations above or below the mean for univariate outliers (Tabachnick & Fidell, 2007) and the Cook's distance for all values fell below one for multivariate outliers (Stevens, 1984). All assumptions were met.

Pre-pandemic ACEs and anxiety diagnosis were included as covariates in all models. School format, whether school was in-session, and the following sociodemographic variables were tested as potential covariates: caregiver relation to the child, child age, child race, child sex, and family socioeconomic status. As previously mentioned, the onset of anxiety disorders increases with age and are more prevalent in females and lower income levels. In addition, disparities in the threat of COVID-19 as well as simultaneous occurrence of the pandemic and civil rights movement (Black Lives Matter) may have exerted additional anxieties on children and families from minority racial and ethnic groups (CDC, 2020; Fortuna et al., 2020). Therefore, to determine the covariates to control for, bivariate correlations, *t*-tests, and one-way ANOVAs were conducted with potential covariates as the predictor variables and symptoms of child anxiety disorders as the outcome variables. For covariates that were significantly associated with one or more outcome variables (see Table 2), hierarchical regression analyses were run to determine which covariates were uniquely associated with the outcome variables over and above

Table 2

Bivariate Correlations among Covariates (N = 90)

Variable	*M*	*SD*	*Range*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Prior ACEs	.54	1.25	0-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Prior diagnosis	.06	.23	0-1	-.03	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Child age	9.92	1.33	8-12	.14	.20	-	-	-	-	-	-	-	-	-	-	-	-
4. Child sex	.53	.50	0-1	.14	.03	.18	-	-	-	-	-	-	-	-	-	-	-
5. School in-session	.78	.42	0-1	.02	-.10	-.05	-.07	-	-	-	-	-	-	-	-	-	-
6. School format	.30	.46	0-1	.01	-.05	-.05	-.21*	-.12	-	-	-	-	-	-	-	-	-
7. Pandemic stress	12.94	7.89	0-28	.23*	-.08	.16	.08	-.15	.10	-	-	-	-	-	-	-	-
8. Attachment security	69.67	9.08	52-84	-.06	.14	.11	-.06	.17	.02	-.05	-	-	-	-	-	-	-
9. Total anxiety	28.76	16.22	1-63	.12	.18	.12	.24*	-.22*	-.34**	.09	-.32**	-	-	-	-	-	-
10. Generalized	6.27	4.11	0-15	.05	.14	.16	.18	-.18	-.33**	.06	-.30**	.87**	-	-	-	-	-
11. Panic/somatic	7.02	6.35	0-23	.06	.05	-.01	.18	-.18	-.24*	.09	-.37**	.87**	.64**	-	-	-	-
12. Separation	6.69	3.34	0-14	.14	.10	.03	.28**	-.10	-.35**	.09	-.14	.80**	.67**	.60**	-	-	-
13. School avoidance	2.18	2.06	0-8	.26*	.33**	.29**	.23*	-.20	-.28**	.06	-.30**	.78**	.62**	.65**	.51**	-	-
14. Social	6.60	3.75	0-14	.11	.26*	.15	.19	-.27**	-.24*	.04	-.17	.76**	.65**	.47**	.52**	.57**	-

other covariates. School format, whether school was in-session, and child sex were significantly related to symptoms of child anxiety disorders and were controlled for as covariates in all moderation analyses. Child age was significantly associated with school avoidance and was controlled for in addition to the aforementioned covariates. Finally, child race, caregiver education, caregiver relation to child, and family income were not significantly associated with any outcome variables and were not controlled for in moderation analyses.

Correlations were run among primary variables, including pandemic stress, caregiver-child attachment security, and symptoms of anxiety disorders variables (see Table 2). Pandemic stress was not significantly associated with caregiver-child attachment security nor symptoms of child anxiety diagnoses. Caregiver-child attachment security was significantly and negatively associated with symptoms of total anxiety, GAD, panic/somatic disorder, and school avoidance. All child anxiety scales were significantly and positively associated with one another.

Primary Analyses

Quantitative data analysis was performed using IBM SPSS software version 27. Prior to analysis, both predictor variables were mean centered, and the pandemic stress x caregiver-child attachment security interaction term was calculated. A series of six hierarchical regression models were run to determine, over and above the effects of covariates, whether: (1) greater pandemic stress was associated with higher scores on each child anxiety scale (Aim 1); and (2) whether the interaction between pandemic stress and caregiver-child attachment security was associated with each of the child anxiety outcomes (Aim 2). The covariates included prior ACEs, prior anxiety diagnosis, school format, whether school was in-session, and child sex for all models. Child age was an additional covariate for symptoms of school avoidance only. In these models, all covariates were entered into the model at step one. Next, the pandemic stress variable

was entered in step two. The caregiver-child attachment security variable was entered at step three. Finally, the interaction term between pandemic stress and caregiver-child attachment security was entered at step four. Symptoms of child anxiety disorders (subscale or total score) were entered as the outcome variable for all models.

As shown in Tables 3 - 8, the hypotheses associated with Aims 1 and 2 were not supported. Neither pandemic stress nor the interaction of pandemic stress and caregiver-child attachment security were significantly associated with any anxiety disorder symptoms over and above the effects of covariates. Each model is described in turn, as follows.

Total Anxiety as an Outcome

The hierarchical regression moderation analysis for total anxiety (see Table 3) revealed that when controlling for the five covariates, only school format (β = -.33, CI: [-.8.57, -4.74], p = .001) and whether school was in-session (β = -.24, CI: [-16.77, -1.78], p = .016) were significantly associated with total anxiety scores at step one. Pandemic stress was not related to total anxiety scores (β = .06, CI: [-.28, .54], p = .526) at step two. Caregiver-child attachment security was related to total anxiety scores (β = -.30, CI: [-.87, -.20], p = .002) at step three. Finally, caregiver-child attachment security did not significantly moderate the association between pandemic stress and total anxiety scores (β = .04, CI: [-.03, .04], p = .720).

Table 3

Hierarchical Regression Results for Total Anxiety

Variable	*B*	95% CI for *B*		*p*	*SE B*	β	R^2	ΔR^2
		LL	*UL*					
Step 1							.24	.24
Constant	35.80	27.35	44.24	<.001***	4.25			
Child sex (female)	4.39	-1.99	10.77	.175	3.21	.14		
Prior ACEs	1.47	-1.03	3.96	.246	1.26	.11		
Prior anxiety diagnosis	9.48	-3.99	22.94	.165	6.77	.13		

School format	-11.66	-18.57	-4.74	.001**	3.48	-.33		
School in-session	-9.27	-16.77	-1.78	.016*	3.77	-.24		
Step 2							.24	.004
Constant	35.71	27.24	44.19	<.001***	4.26			
Child sex (female)	4.27	-2.14	10.69	.189	3.23	.13		
Prior ACEs	1.28	-1.29	3.86	.323	1.29	.10		
Prior anxiety diagnosis	9.89	-3.69	23.46	.151	6.82	.14		
School format	-11.85	-18.82	-4.88	.001**	3.50	-.34		
School in-session	-8.91	-16.52	-1.30	.022*	3.82	-.23		
Pandemic stress	.13	-.28	.54	.526	.21	.06		
Step 3							.32	.08
Constant	33.91	25.79	42.04	<.000***	4.09			
Child sex (female)	3.94	-2.15	10.04	.202	3.06	.12		
Prior ACEs	1.09	-1.35	3.54	.377	1.23	.08		
Prior anxiety diagnosis	13.36	.29	26.43	.045*	6.57	.19		
School format	-11.37	-17.99	-4.75	.001**	3.33	-.32		
School in-session	-6.67	-14.03	.69	.075	3.70	-.17		
Pandemic stress	.13	-.26	.52	.504	.20	.06		
Attachment security	-.53	-.87	-.20	.002**	.17	-.30		
Step 4							.32	.001
Constant	34.13	25.87	42.39	<.001***	4.15			
Child sex (female)	4.06	-2.10	10.22	.194	3.10	.13		
Prior ACEs	1.09	-1.37	3.54	.381	1.23	.08		
Prior anxiety diagnosis	13.53	.35	26.70	.044*	6.62	.19		
School format	-11.34	-18.00	-4.68	.001**	3.35	-.32		
School in-session	-7.01	-14.65	.63	.071	3.84	-.18		
Pandemic stress	.14	-.25	.54	.479	.20	.07		
Attachment security	-.53	-.87	-.20	.002**	.17	-.30		
Pandemic stress x Attachment security	.01	-.03	.04	.720	.02	.04		

Note. CI = confidence interval; LL = lower limit; UL = upper limit. *$p < .05$. **$p < .01$. ***$p < .001$.

Symptoms of Generalized Anxiety Disorder as an Outcome

The hierarchical regression moderation analysis for symptoms of Generalized Anxiety Disorder (GAD; see Table 4) revealed that when controlling for the five covariates, only school format (β = -.33, CI: [-4.76, -1.11], p = .002) and whether school was in-session (β = -.20, CI: [-3.98, -.03], p = .047) were significantly associated with symptoms of GAD at step one. Pandemic stress was not related to symptoms of GAD (β = .06, CI: [-.08, .14], p = .567) at step two. Caregiver-child attachment security was related to symptoms of GAD (β = -.28, CI: [-.22, -.04], p = .006) at step three. Finally, caregiver-child attachment security did not significantly moderate the association between pandemic stress and symptoms of GAD (β = .07, CI: [-.01, .01], p = .499).

Table 4

Hierarchical Regression Results for Symptoms of Generalized Anxiety Disorder

Variable	*B*	95% CI for *B*		*p*	*SE B*	β	R^2	ΔR^2
		LL	*UL*					
Step 1							.17	.17
Constant	8.18	5.95	10.40	<.001***	1.12			
Child sex (female)	.66	-1.02	2.34	.435	.85	.08		
Prior ACEs	.15	-.51	.81	.653	.33	.05		
Prior anxiety diagnosis	1.76	-1.79	5.31	.327	1.78	.10		
School format	-2.93	-4.76	-1.11	.002**	.92	-.33		
School in-session	-2.01	-3.98	-.03	.047*	.99	-.20		
Step 2							.42	.003
Constant	8.16	5.92	10.39	<.001***	1.12			
Child sex (female)	.63	-1.06	2.33	.458	.85	.08		
Prior ACEs	.11	-.57	.78	.757	.34	.03		
Prior anxiety diagnosis	1.86	-1.72	5.44	.305	1.80	.10		
School format	-2.98	-4.82	-1.14	.002**	.92	-.33		
School in-session	-1.92	-3.93	.09	.060	1.01	-.20		
Pandemic stress	.03	-.08	.14	.567	.05	.06		
Step 3							.50	.07

Constant	7.73	5.56	9.90	<.000***	1.09			
Child sex (female)	.56	-1.07	2.18	.498	.82	.07		
Prior ACEs	.06	-.59	.71	.855	.33	.02		
Prior anxiety diagnosis	2.68	-.81	6.17	.130	1.75	.15		
School format	-2.87	-4.63	-1.10	.002**	.89	-.32		
School in-session	-1.39	-3.35	.57	.163	.99	-.14		
Pandemic stress	.03	-.07	.14	.552	.05	.06		
Attachment security	-.13	-.22	-.04	.006**	.04	-.28		
Step 4							.51	.004
Constant	7.84	5.64	10.04	<.001***	1.11			
Child sex (female)	.62	-1.03	2.26	.458	.82	.08		
Prior ACEs	.06	-.60	.71	.860	.33	.02		
Prior anxiety diagnosis	2.76	-.75	6.27	.121	1.76	.15		
School format	-2.85	-4.63	-1.08	.002**	.89	-.32		
School in-session	-1.56	-3.60	.47	.130	1.02	-.16		
Pandemic stress	.04	-.07	.14	.496	.05	.07		
Attachment security	-.13	-.21	-.04	.007**	.04	-.28		
Pandemic stress x Attachment security	.002	-.01	.01	.499	.005	.07		

Note. CI = confidence interval; LL = lower limit; UL = upper limit. *p < .05. **p < .01. ***p < .001.

Symptoms of Panic/Somatic Disorder as an Outcome

The hierarchical regression moderation analysis for symptoms of panic/somatic disorder (see Table 5) revealed that when controlling for the five covariates, only school format (β = -.24, CI: [-6.23, -.39], p = .027) was significantly associated with symptoms of panic/somatic disorder at step one. Pandemic stress was not related to symptoms of panic/somatic disorder (β = .07, CI: [-.11, .23], p = .504) at step two. Caregiver-child attachment security was related to symptoms of panic/somatic disorder (β = -.34, CI: [-.38, -.10], p = .001) at step three. Finally, caregiver-child

attachment security did not significantly moderate the association between pandemic stress and symptoms of panic/somatic disorder (β = .01, CI: [-.02, .02], p = .955).

Table 5

Hierarchical Regression Results for Symptoms of Panic/Somatic Disorder

Variable	*B*	95% CI for *B*		*p*	*SE B*	β	R^2	ΔR^2
		LL	*UL*					
Step 1							.11	.11
Constant	9.47	5.91	13.03	<.001***	1.79			
Child sex (female)	1.31	-1.38	4.00	.335	1.35	.10		
Prior ACEs	.24	-.82	1.29	.658	.53	.05		
Prior anxiety diagnosis	.49	-5.19	6.17	.864	2.86	.02		
School format	-3.31	-6.23	-.39	.027*	1.47	-.24		
School in-session	-2.97	-6.13	.19	.065	1.59	-.20		
Step 2							.12	.005
Constant	9.43	5.86	13.01	<.001***	1.80			
Child sex (female)	1.26	-1.45	3.96	.358	1.36	.10		
Prior ACEs	.15	-.93	1.24	.778	.55	.03		
Prior anxiety diagnosis	.67	-5.05	6.40	.815	2.88	.02		
School format	-3.40	-6.34	-.46	.024*	1.48	-.25		
School in-session	-2.81	-6.02	.40	.085	1.61	-.18		
Pandemic stress	.06	-.11	.23	.504	.09	.07		
Step 3							.23	.11
Constant	8.62	5.22	12.02	<.001***	1.71			
Child sex (female)	1.11	-1.44	3.66	.388	1.28	.09		
Prior ACEs	.07	-.95	1.09	.896	.51	.01		
Prior anxiety diagnosis	2.24	-3.23	7.71	.417	2.75	.08		
School format	-3.18	-5.95	-.41	.025*	1.39	-.23		
School in-session	-1.80	-4.88	1.28	.248	1.55	-.12		
Pandemic stress	.06	-.10	.22	.478	.08	.07		
Attachment security	-.24	-.38	-.10	.001**	.07	-.34		
Step 4							.23	<.001
Constant	8.64	5.18	12.09	<.001***	1.74			
Child sex (female)	1.12	-1.46	3.70	.391	1.30	.09		
Prior ACEs	.07	-.96	1.10	.897	.52	.01		

Prior anxiety diagnosis	2.25	-3.26	7.76	.419	2.77	.08
School format	-3.18	-5.97	-.39	.026*	1.40	-.23
School in-session	-1.82	-5.02	1.38	.260	1.61	-.12
Pandemic stress	.06	-.11	.22	.480	.08	.07
Attachment security	-.24	-.38	-.10	.001**	.07	-.34
Pandemic stress x Attachment security	<.001	-.02	.02	.955	.01	.01

Note. CI = confidence interval; LL = lower limit; UL = upper limit. *p < .05. **p < .01. ***p < .001.

Symptoms of Separation Anxiety as an Outcome

The hierarchical regression moderation analysis for separation anxiety (see Table 6) revealed that when controlling for the five covariates, only school format (β = -.32, CI: [-3.77, -.85], p = .002) was significantly associated with symptoms of separation anxiety at step one. Pandemic stress was not related to symptoms of separation anxiety (β = .08, CI: [-.06, .12], p = .463) at step two. Similarly, caregiver-child attachment security was not related to symptoms of separation anxiety (β = -.11, CI: [-.11, .04], p = .297) at step three. Finally, caregiver-child attachment security did not significantly moderate the association between pandemic stress and symptoms of separation anxiety (β = -.04, CI: [-.01, .01], p = .732).

Table 6

Hierarchical Regression Results for Symptoms of Separation Anxiety

Variable	*B*	95% CI for *B*		*p*	*SE B*	β	R^2	ΔR^2
		LL	*UL*					
Step 1							.45	.20
Constant	7.23	5.45	9.01	<.001***	.90			
Child sex (female)	1.23	-.11	2.58	.072	.68	.19		
Prior ACEs	.33	-.20	.86	.215	.27	.12		
Prior anxiety diagnosis	.93	-1.91	3.77	.517	1.43	.06		
School format	-2.31	-3.77	-.85	.002**	.73	-.32		
School in-session	-.94	-2.52	.64	.239	.80	-.12		
Step 2							.45	.005

Constant	7.21	5.42	9.00	<.001***	.90			
Child sex (female)	1.20	-.15	2.55	.081	.68	.18		
Prior ACEs	.29	-.26	.83	.296	.27	.11		
Prior anxiety diagnosis	1.03	-1.83	3.89	.476	1.44	.07		
School format	-2.36	-3.83	-.89	.002**	.74	-.33		
School in-session	-.86	-2.46	.75	.292	.81	-.11		
Pandemic stress	.03	-.06	.12	.463	.04	.08		
Step 3							.46	.01
Constant	7.08	5.27	8.88	<.001***	.91			
Child sex (female)	1.18	-.17	2.53	.087	.68	.18		
Prior ACEs	.27	-.27	.81	.321	.27	.10		
Prior anxiety diagnosis	1.28	-1.62	4.19	.381	1.46	.09		
School format	-2.33	-3.79	-.86	.002**	.74	-.32		
School in-session	-.69	-2.32	.94	.403	.82	-.09		
Pandemic stress	.03	-.05	.12	.463	.04	.08		
Attachment security	-.04	-.11	.04	.297	.04	-.11		
Step 4							.46	.001
Constant	7.03	5.20	8.86	<.001***	.92			
Child sex (female)	1.15	-.21	2.52	.097	.69	.17		
Prior ACEs	.27	-.27	.82	.322	.27	.10		
Prior anxiety diagnosis	1.25	-1.68	4.17	.398	1.47	.09		
School format	-2.33	-3.81	-.85	.002**	.74	-.32		
School in-session	-.62	-2.31	1.08	.471	.85	-.08		
Pandemic stress	.03	-.06	.12	.500	.04	.07		
Attachment security	-.04	-.11	.04	.295	.04	-.11		
Pandemic stress x Attachment security	-.001	-.01	.01	.732	.004	-.04		

Note. CI = confidence interval; LL = lower limit; UL = upper limit. *p < .05. **p < .01. ***p < .001.

Symptoms of Significant School Avoidance as an Outcome

The hierarchical regression moderation analysis for significant school avoidance (see Table 7) revealed that when controlling for the six covariates, only prior ACEs (β = .23, CI: [.08, .68], p = .014), prior anxiety diagnosis (β = .27, CI: [.79, 4.08], p = .004), and school format (β = -.26, CI: [-1.99, -.34], p = .006) were significantly associated with symptoms of school avoidance at step one. Pandemic stress was not related to symptoms of school avoidance (β = -

.004, CI: [-.05, .05], p = .970) at step two. Caregiver-child attachment security was related to symptoms of school avoidance (β = -.33, CI: [-.11, -.03], p = <.001) at step three. Finally, caregiver-child attachment security did not significantly moderate the association between pandemic stress and symptoms of school avoidance (β = .08, CI: [-.003, .01], p = .404).

Table 7

Hierarchical Regression Results for Symptoms of Significant School Avoidance

Variable	*B*	95% CI for *B*		*p*	*SE B*	β	R^2	ΔR^2
		LL	*UL*					
Step 1							.33	.33
Constant	.11	-2.87	3.09	.944	1.50			
Child age	.26	-.03	.55	.081	.15	.17		
Child sex (female)	.38	-.39	1.16	.328	.39	.09		
Prior ACEs	.38	.08	.68	.014	.15	.23		
Prior anxiety diagnosis	2.43	.79	4.08	.004	.83	.27		
School format	-1.17	-1.99	-.34	.006**	.42	-.26		
School in-session	-.89	-1.78	.01	.053	.45	-.18		
Step 2							.33	<.001
Constant	.10	-2.92	3.12	.948	1.52			
Child age	.26	-.04	.56	.085	.15	.17		
Child sex (female)	.38	-.40	1.16	.330	.39	.09		
Prior ACEs	.38	.07	.69	.016*	.16	.23		
Prior anxiety diagnosis	2.43	.76	4.10	.005**	.84	.27		
School format	-1.17	-2.00	-.33	.007**	.42	-.26		
School in-session	-.89	-1.80	.03	.056	.46	-.18		
Pandemic stress	-.001	-.05	.05	.970	.03	.004		
Step 3							.43	.10
Constant	-.68	-3.53	2.16	.633	1.43			
Child age	.32	.04	.59	.026*	.14	.20		
Child sex (female)	.32	-.41	1.04	.387	.36	.08		
Prior ACEs	.35	.06	.64	.018	.15	.21		
Prior anxiety diagnosis	2.85	1.28	4.41	<.001***	.79	.32		
School format	-1.09	-1.87	-.32	.007**	.39	-.25		
School in-session	-.58	-1.44	.29	.188	.44	-.12		

Pandemic stress	.00	-.05	.04	.923	.02	-.01		
Attachment security	-.07	-.11	-.03	<.001***	.02	-.33		
Step 4							.43	.005
Constant	-.66	-3.51	2.19	.647	1.43			
Child age	.32	.04	.60	.025*	.14	.21		
Child sex (female)	.35	-.38	1.08	.347	.37	.09		
Prior ACEs	.35	.06	.64	.019*	.15	.21		
Prior anxiety diagnosis	2.89	1.32	4.46	<.001***	.79	.32		
School format	-1.09	-1.87	-.31	.007**	.39	-.24		
School in-session	-.67	-1.57	.22	.140	.45	-.14		
Pandemic stress	.00	-.05	.05	.987	.02	.00		
Attachment security	-.07	-.11	-.03	<.001***	.02	-.32		
Pandemic stress x Attachment security	.002	-.003	.01	.404	.002	.08		

Note. CI = confidence interval; LL = lower limit; UL = upper limit. *p < .05. **p < .01. ***p < .001.

Symptoms of Social Anxiety Disorder as an Outcome

The hierarchical regression moderation analysis for social anxiety disorder (see Table 8) revealed that when controlling for the five covariates, only prior anxiety diagnosis (β = .22, CI: [.42, 6.73], p = .027), school format (β = -.24, CI: [-3.54, -.30], p = .021), and whether school was in-session (β = -.27, CI: [-4.20, -.69], p = .007) were significantly associated with symptoms of social anxiety at step one. Pandemic stress was not related to symptoms of social anxiety (β = .01, CI: [-.09, .10], p = .926) at step two. Similarly, caregiver-child attachment security was not related to symptoms of social anxiety (β = -.14, CI: [-.14, -.02], p = .159) at step three. Finally, caregiver-child attachment security did not significantly moderate the association between pandemic stress and symptoms of social anxiety (β = .06, CI: [-.01, .01], p = .597).

Table 8

Hierarchical Regression Results for Symptoms of Social Anxiety Disorder

Variable	*B*	95% CI for *B*	*p*	*SE B*	β	R^2	ΔR^2

		LL	*UL*					
Step 1							.22	.22
Constant	8.32	6.35	10.30	<.001***	.99			
Child sex (female)	.70	-.80	2.19	.355	.75	.09		
Prior ACEs	.34	-.25	.92	.257	.29	.11		
Prior anxiety diagnosis	3.57	.42	6.73	.027*	1.59	.22		
School format	-1.92	-3.54	-.30	.021*	.81	-.24		
School in-session	-2.45	-4.20	-.69	.007**	.88	-.27		
Step 2							.22	<.001
Constant	8.32	6.33	10.31	<.001***	1.00			
Child sex (female)	.69	-.81	2.20	.362	.76	.09		
Prior ACEs	.33	-.27	.93	.281	.30	.11		
Prior anxiety diagnosis	3.59	.40	6.78	.028*	1.60	.22		
School format	-1.93	-3.57	-.29	.021*	.82	-.24		
School in-session	-2.43	-4.22	-.65	.008**	.90	-.27		
Pandemic stress	.006	-.09	.10	.926	.05	.01		
Step 3							.24	.02
Constant	8.12	6.12	10.12	<.001***	1.00			
Child sex (female)	.66	-.84	2.16	.385	.75	.09		
Prior ACEs	.31	-.29	.91	.311	.30	.10		
Prior anxiety diagnosis	3.97	.76	7.18	.016*	1.62	.24		
School format	-1.88	-3.50	-.25	.025*	.82	-.23		
School in-session	-2.19	-4.00	-.38	.018*	.91	-.24		
Pandemic stress	.006	-.09	.10	.925	.05	.01		
Attachment security	-.06	-.14	.02	.159	.04	-.14		
Step 4							.24	.003
Constant	8.21	6.18	10.24	<.001***	1.02			
Child sex (female)	.70	-.81	2.22	.357	.76	.09		
Prior ACEs	.31	-.30	.91	.315	.30	.10		
Prior anxiety diagnosis	4.04	.80	7.27	.015*	1.63	.25		
School format	-1.87	-3.50	-.23	.026*	.82	-.23		
School in-session	-2.32	-4.20	-.45	.016*	.94	-.26		
Pandemic stress	.01	-.09	.11	.863	.05	.02		
Attachment security	-.06	-.14	.02	.167	.04	-.14		

Pandemic stress x Attachment security	.003	-.01	.01	.567	.006	.06

Note. CI = confidence interval; LL = lower limit; UL = upper limit. *$p < .05$. **$p < .01$. ***$p < .001$.

Discussion

The purpose of this study was to explore the association between pandemic stress on families and symptoms of anxiety disorders in children, and to better understand how caregiver-child attachment security moderates the association. Extant literature has linked the pandemic to heightened levels of stress and anxiety (Alves et al., 2020; APA; 2021; Chen et al., 2020; Duan et al., 2020; Ellis et al., 2020; Lavigne-Cervan et al., 2021; Orgiles et al., 2021; Panda et al., 2021; Racine et al., 2021; Ravens-Sieberer et al., 2021; Vowels et al., 2021), but few studies have examined children's vulnerability to subtypes of anxiety nor the role of the caregiver-child attachment security as a protective factor in this context. Symptoms can present in middle childhood, and it is known that the family environment can work to exacerbate or buffer the risk of an anxiety disorder. Since the family system is interdependent on its members, individuals are strongly influenced by one another. Like other historical and major disasters, the COVID-19 pandemic has challenged many families and the added stress may damage family relationships and mental health (Miller et al., 2000). Given the extended time families have spent at home together due to pandemic-related precautions, it was especially necessary to explore the moderating role of caregiver-child attachment security on the association between pandemic stress and child anxiety symptoms.

Explanation of Primary Findings

Children in the current study reported relatively high levels of anxiety symptoms compared to past studies using the SCARED measure. More specifically, mean anxiety levels in this study were closer to mean levels of children from clinical/anxious populations than those

from community/non-anxious populations (Bettis et al., 2021; DeSousa et al., 2013; Rappaport et al., 2017). This finding supports other studies showing elevated child mental health problems during the COVID-19 pandemic (e.g., Shoshani & Kor, 2021). However, and contrary to the first hypothesis, pandemic stress was not associated with symptoms of anxiety disorders. This could be due to low statistical power. Low power decreases the likelihood of significant results. Although the sample size was adequate to detect a medium effect, it is possible that a larger sample size would have helped with model significance, especially since the models also included five or six covariates each. However, it is important to note that since the associations between pandemic stress and child anxiety symptoms were weak, it is unlikely that this null finding was a function of statistical power alone. As such, there were several methodological and theoretical possibilities that may provide additional insight to the null findings.

Epidemic-Pandemic Impacts Inventory as a Measure of Pandemic Stress

The measure used for pandemic stress (i.e., EPII) may have played a role in the non-significant relationship between pandemic stress and symptoms of anxiety disorders. The EPII was recently published at the time of study implementation and thus, the measure's psychometrics and best scoring practices were unknown. For example, this study summed the negative pandemic-related events into a total score, similar to a stressful life events checklist. It is possible that combining all items into a single scale was not an ideal approach. Instead, since the EPII assessed several domains (i.e., work life, home life, social activities and isolation, emotional/physical health and infection, and positive change), it might have been more beneficial to combine items by domain, with an eye toward domain proximity of stressors to the child, to uncover more nuanced insight into which domains of pandemic-related stressors affect child anxiety. Moreover, recent literature that has used the full version of the EPII applied person-

centered approaches (i.e., latent profile analysis) to form profiles of family stress (Grasso et al., 2021). Person-centered approaches allow for heterogeneity in subgroups as opposed to variable-centered approaches that assume homogeneity (Masyn, 2013). Therefore, it is possible that certain profiles within the EPII measure may be associated with symptoms of child anxiety while others may not. Future research using the brief form of the EPII should consider using a person-centered approach rather than a variable-centered approach to further understand subgroup differences.

Pandemic Stressors and Strengths

In addition to statistical power and pandemic stress measurement, it is also possible that the findings could be explained by the extent to which the endorsed pandemic-related experiences were stressful enough to be associated with child anxiety symptomatology in the current sample. For example, data collection began over a year after the pandemic was declared a global health crisis and during the summer of 2021. At that time, many states had lifted previously mandated prevention protocols, children and families had over a year to adjust to the pandemic and related circumstances, and schools were on summer break. It is possible that the summer was a historic time of short-lived reprieve from the pandemic, which may have lowered feelings of anxiety for children. Even into fall, when many children returned to school, educational settings tended to be more stable than earlier in the pandemic. Although this inference was not supported by the study findings, less than a quarter of the children were out of school and thus it may still be a fruitful area of exploration for future research.

Additionally, several pandemic-related items in the EPII focused on more time spent at home (e.g., reduction of work hours, children receiving home instruction, unavailable childcare, etc.). These items were purported to impact the family negatively, but the increased time at home

with caregivers could have been a positive experience for some children. For example, 80% of caregivers in this study reported that they enjoyed more quality time together with their families and 68% reported greater meaning and more effective work, school, and friendships compared to before the pandemic. It is also possible that for pandemic-related stress to influence child anxiety, it must be very salient. However, most families in this study did not report someone in the household being diagnosed (79%) with or dying (77%) from COVID-19. Therefore, although families experienced some of the pandemic-related changes listed in the EPII, it is possible that the changes were not very stressful and/or the stress was offset by the benefits of the changes.

Moreover, the pandemic-related changes could have been particularly beneficial for anxious children. Di Guinta et al. (2021) speculated the quarantine may have offered protection from anxiety-provoking situations (e.g., academic and social school pressures) based on a survey of clinically anxious children. Relatedly, children in the current study had mean anxiety levels that nearly resembled clinical levels (DeSousa et al., 2013; Rappaport et al., 2017). These levels were higher than expected based on past non-anxious, community samples (Bettis et al., 2021; DeSousa et al., 2013; Rappaport et al., 2017). Therefore, it is plausible that the resultant family changes, as indicated on the EPII, were less important compared to how families functioned during the extended home confinement periods (Shoshani & Kor, 2021).

The likelihood for children to adapt during the pandemic can also be inferred from reported ACEs scores. A recent study found that youth ACEs and pandemic stress were positively associated, such that higher ACEs scores were related to higher endorsements of pandemic stress (D'Costa et al., 2021). It is known that ACEs can disrupt developmental processes and compromise adaptation to a stressful event (Herbers et al., 2022). In other words, higher ACEs scores might make it more challenging for children to adapt given their elevated

stress within their adaptive systems (e.g., home environment). However, when the adaptive systems are well-functioning, most children will show resilience to a disaster (e.g., pandemic; Herbers et al., 2022). About 75% of the current sample reported that they did not experience any ACEs prior to the pandemic, which may be an indicator of well-functioning adaptive systems that allowed children to effectively adapt and show resilient outcomes (Elmore & Crouch, 2021) during the pandemic.

In addition to highlighting the privilege of the current sample via low instances of reported ACEs, attention should also be given to the sample's privilege in that it comprised mostly White and middle-income participants. It is possible that the experiences of historically marginalized groups (e.g., racial minority, low-income, and/or high ACEs groups) were not accurately captured and that this sample was not impacted by the pandemic to the same degree. Although pandemic stress was not significantly associated with anxiety scores after controlling for covariates in this sample, studies have documented that historically marginalized groups were indeed disproportionately impacted by the pandemic (Albrecht, 2022; Fortuna et al., 2020; Magesh et al., 2021; CDC, 2020; Sonu et al., 2021). It is important to highlight that the studies referenced for predicting child anxiety during the pandemic reported little, if any demographic information. Those studies that did were often from non-US countries, were mostly White, college educated, two-parent households, and data was collected at the start of the pandemic. Therefore, it would be important to further explore the influence of covariates as risk factors for heightened anxiety, rather than controlling for them. A latent profile analysis of the sample may also be justified to better understand heterogeneity within the sample, which in turn would clarify the differences in acute and chronic stressors that were compounded by the influence of the pandemic as they relate to the individual experience.

Role of Caregiver-Child Relationship

Contrary to the second hypothesis, findings did not support a moderating role of caregiver-child attachment security on pandemic stress and symptoms of child anxiety disorders for all scales (total score, generalized, panic/somatic, separation, school avoidance, and social). In addition to explanations mentioned above (i.e., low statistical power, the measure used for the independent variable, and sample characteristics), further exploration of the role of the caregiver-child relationship can help to better understand these non-significant findings. It is important to consider the perceptions and relevance that the pandemic has to families. Since this study collected data from a national sample and during a time in which the pandemic-related threat was also associated with certain political affiliations, pandemic ideologies varied and could have influenced the perceptions and relevance of the pandemic within the household. For example, one study provided evidence that families holding a conservative political affiliation perceived the virus as less threatening and that the media had exaggerated its severity (Calvillo et al., 2020). In the context of middle childhood and the strength of influence caregivers have over their children, it could be that caregivers served as key informants for children in regard to the coronavirus. In some cases, the narrative of information (e.g., non-threatening vs. threatening) that caregivers presented to their children regarding the virus could have served as a third, unmeasured variable that either buffered or exacerbated their children's worry. This explanation could contribute to null findings as families on opposite ends of political affiliations may have had opposing perceptions of the pandemic, thus canceling the effects of the other out.

Moreover, caregiver-child attachment security and anxiety scores were significantly and negatively associated. Higher caregiver-child attachment security was associated with low levels of anxiety symptoms. This association indicated that the relationship was important to child

anxiety levels and could therefore be protective. The finding was supported in attachment and COVID-19 literature, in which strong caregiver-child attachment security buffered the risk of mental health disorders. For example, a recent study indicated that children reported lower levels of anxiety when family routines and social support were well-maintained during the pandemic (Shoshani & Kor, 2021). These findings highlight the importance of stability and relationships within the household during pandemic quarantine for child mental health resilience, particularly in middle childhood. It is known that children in middle childhood (8 – 12 years) are responsive to their caregivers and as children mature through adolescence and older, caregivers become less influential and are replaced with other forms of support such as peers and significant others. As such, the middle childhood developmental stage may be particularly fruitful for targeted interventions promoting the quality of caregiver-child relationships.

Moreover, children in the current study reported relatively high levels of anxiety symptoms compared to past studies using the SCARED measure. More specifically, mean anxiety levels in this study were closer to mean levels of children from clinical/anxious populations than those from community/non-anxious populations (Bettis et al., 2021; DeSousa et al., 2013; Rappaport et al., 2017). This finding supported other studies that showed elevated child mental health problems during the COVID-19 pandemic (e.g., Shoshani & Kor, 2021) and suggested a cohort effect (i.e., a shared experience that defines the changes in group characteristics) related to levels of children's anxiety during this time and developmental period.

Study Strengths and Limitations

This study had several strengths. First, and unique to literature regarding COVID-19 and child anxiety, the study leveraged both caregiver and child reports to increase the reliability of accounts of personal experience. For example, a study that solely relies on the caregiver's report

of their child's personal experience may not present an accurate representation of the child's experience. Thus, this study extended upon the literature to include multiple perspectives, particularly highlighting the voice of the middle childhood cohort. Second, through online data collection, the study collected responses during the pandemic and across the United States to create a sample that was timely and relatively representative of the national population.

This study also had some limitations. First, data collection began in summer of 2021, while children were on summer break and preventative protocols were relaxed. Data collection continued through winter of 2021, when children returned to school and preventative protocols were reinforced. The school-in-session variable was associated with child anxiety symptoms, such that children who were in-school reported lower levels of anxiety than children out of school. Thus, timing of data collection is particularly worth consideration when implementing a study and analyzing the data during the pandemic. Moreover, data collection was also interrupted multiple times to ensure data integrity, which impacted the ease and speed of recruitment, increased the length of time between collection waves, and limited the sample size. Second, the variable used to determine whether the child was still in-school vs. not (e.g., on summer break) may have been vulnerable to misinterpretation. For example, the question asked, "Is your child attending school now?" In hindsight, it was possible that the phrase "attending school now" may have been interpreted in two different ways: (1) child is attending school in-person or (2) child is not yet on summer break. Thus, interpreting the meaning of that covariate was challenging. Third, the sample was small, comprising mostly families from White, two-parent households in which mothers primarily self-identified as the primary caregiver. Approximately half the child sample reported learning in-person, which created an uneven distribution of the number of children per school format. As such, this may make it difficult to generalize findings across

populations. Fourth, the measure used for pandemic stress was recently published at the time of study implementation. Thus, the measure of psychometrics and best scoring practices were unknown. Fifth, it will be important for future studies to implement longitudinal designs to investigate developmental trajectories for those children who benefitted from the quarantine. More specifically, although children may have enjoyed increased time with family and limited interaction with anxiety provoking situations, middle childhood is a formative period for social development and is particularly salient when entering adolescence. Thus, it will be important to track children across development to understand whether their anxiety may be heightened later in life due to the quarantine and resultant social isolation from peers.

Practical Implications

The findings from this study suggest several practical implications. It remains important for families to continue to have calm discussions about fears with other family members to understand, address, and identify ways in which to attenuate those fears. This discourse could be supported by mental and medical health providers to identify ways to make meaningful interpretations of the pandemic experience, educate families on the risk and protective factors for overall family health, and to mitigate future risk of child anxiety. Additionally, resources and support systems could be leveraged to assist families who were challenged by the pandemic. More specifically, it was important to identify and understand specific pandemic-related challenges that may relate to child anxiety symptoms so that targeted preventative efforts can be implemented to alleviate risk. Targeted preventative efforts grounded in attachment, family systems, and stress theories may help to promote calm and educated discussions within the family, to which may benefit families throughout the ongoing pandemic and potential future health crises.

Future Directions

Future studies that examine the influence of caregiver-child relationships on child mental health during the COVID-19 pandemic may benefit from considering the following suggestions. Research should continue to consider the potential specificity of anxiety subscales. Results from this study indicated that prior anxiety diagnosis was significantly associated with school avoidance and social anxiety subscales, suggesting some subscale specificity. Therefore, it may be important for future studies to include subscales of anxiety when assessing children in middle childhood (ages 8 - 12). Studies might also implement longitudinal designs to better understand how anxiety outcomes differ at different timepoints (e.g., seasons, changes in preventative protocols, variants of the virus, etc.). Research could also examine other key factors that may influence child mental health outcomes during the pandemic, such as specific COVID-19 related stressors, household resources, other familial relationships (e.g., marital), or the perceived level of threat of the pandemic for families. Studies might also consider contextual factors that may contribute to variation in macro-level responses such as geographic region (e.g., state), locality (e.g., urban vs. rural areas), and political affiliation (e.g., democrat vs. republican). These contextual factors may be influential in future research when considering the impact that the pandemic had on families and child anxiety levels. Finally, studies might consider highlighting cultural differences that protect against or contribute to racial and ethnic disparities, particularly considering the disproportionate impact that the pandemic has had on systematically marginalized groups. This could provide diversity in the literature and stimulate meaningful action and discussion.

Conclusion

This study used attachment, family systems, and stress theories to illustrate how the COVID-19 pandemic has the potential to impact families and influence their relationships, and how those factors work to interactively contribute to child anxiety. The study findings were null, indicating that there is more research to be done to better understand child anxiety outcomes during the COVID-19 pandemic and the influence the caregiver-child relationship may have on those outcomes. Future research that inspires targeted preventive efforts may benefit families throughout the ongoing pandemic and hereafter health crises.

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Appendix A

EPII-B© (*Updated 9/14/20*) Grasso, Briggs-Gowan, Ford, and Carter (2020) All Rights Reserved

Epidemic-Pandemic Impacts Inventory (EPII) – Brief Form

INSTRUCTIONS

We would like to learn how COVID-19 has changed people's lives. For each statement below, please indicate whether the pandemic has impacted you or your family in the way described.

Since the COVID-19 pandemic began, what has changed for you or your family?					
	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
1. I or someone in my home was laid off, furloughed, had to close a business, or had reduced work hours					
2. I or someone in my home had to work in close contact with people who might be infected	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
3. I or someone in my home had an increase in workload or work responsibilities	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
4. I or someone in my home provided direct care or services to people who had the disease	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family

5. A child or teenager/young adult I care for could not go to school or needed home instruction	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
6. Childcare or babysitting was unavailable to me or someone in my home when needed	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family

7. I or another caregiver had more conflict with or was harsher in disciplining my child or children	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
8. I spent a lot more time taking care of a family member most days	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
9. My family had to move, relocate, was evicted, or became homeless	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
10. There was an increase in verbal or physical conflict with a partner or spouse	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family

11. There was an increase in verbal or physical conflict among other family in my home	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
12. My family was unable to pay for or get enough food or clean water	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
13. My family was unable to pay important large bills like rent or utilities	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
14. My family had trouble getting places due to less access to public transportation or concerns about safety	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family

15. I or someone in my home did not have the ability or resources to talk to or see family or friends while separated	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
16. My family had to cancel or could not attend important celebrations (such as weddings) or religious ceremonies or funerals	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family

17.	I or someone in my home was unable to be with a close family member who was hospitalized, in a nursing home, or in critical condition	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
18.	I or someone in my home was isolated or quarantined due to possible exposure to the disease, symptoms, or increased risk	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
19.	I had limited physical closeness with my child or loved one due to concerns of infection	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
20.	My child[ren] had more frequent or severe behavioral or emotional problems (for example, mood, anxiety, sleep, nightmares)	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
21.	I or someone in my home had more frequent or severe mental health problems, sleep, or use of alcohol or substances	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
22.	I or someone in my home was unable to access or was less satisfied with	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family

	mental health treatment or therapy				

23.	I or someone in my home could not get enough medication or medical treatment for a chronic illness or pain	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
24.	I or someone in my home got less exercise, spent more time sitting down, or ate more junk food	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
25.	I or someone in my home had important medical procedures cancelled or was unable to access medical care for a serious condition	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
26.	I or someone in my home tested positive for COVID-19 and had severe symptoms	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
27.	A close friend or family member died from COVID-19 or related complications	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family

28.	My family enjoyed more quality time together, paid more attention to personal health, or made new connections with one another or with friends	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
29.	I or someone in my home was harassed or blamed for causing or spreading COVID-19, or was denied or unable to access services or treatment for COVID-19 because of my race/ethnicity	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family
30.	I found greater meaning and was more effective in my work, school, or friendships than before COVID-19	0 Did not happen	1 Happened but no impact on me or my family	2 Some impact on me or my family	3 A lot of impact on me or my family	4 Extreme impact on me or my family

Appendix B

Instructions: Please read each statement below and think about your parent or parents. Mark the answer that shows how true each statement is for you.

Scoring the IPPA-R

- All items are scored as 1 = Never True, 2 = Sometimes True, 3 = Always True
- Italicized items are reverse scored.
- Factors are as follows: [A = Alienation; C = Communication; T = Trust; * = On subsequent factor analyses item did not load sufficiently highly for inclusion]

Parent Scale Items

1. My parents respect my feelings - T
2. My parents are good parents - T
3. *I wish I had different parents* *
4. My parents accept me as I am. T
5. *I can't depend on my parents to help me solve a problem.* *
6. I like to get my parents' view on things I'm worried about. C
7. *It does not help to show my feelings when I am upset.* *
8. My parents can tell when I'm upset about something. C
9. *I feel silly or ashamed when I talk about my problems with my parents.* A
10. *My parents expect too much from me.* *
11. *I easily get upset at home.* A
12. *I get upset a lot more than my parents know about.* A
13. When I talk about things with my parents they listen to what I think. T
14. My parents listen to my opinions. T
15. *My parents have their own problems, so I don't bother them with mine.* *
16. My parents help me to understand myself better. C
17. I tell my parents about my problems and troubles. C
18. *I feel angry with my parents.* A
19. *I don't get much attention at home.* A
20. My parents support me to talk about my worries. C
21. My parents understand me. T
22. *I don't know who I can depend on.* A
23. When I am angry about something, my parents try to understand. T
24. I trust my parents. T
25. *My parents don't understand my problems.* A
26. I can count on my parents when I need to talk about a problem. C
27. *No one understands me.* A
28 If my parents know that I am upset about something, they ask me about it. C

Gullone & Robinson (2005)

Appendix C

Screen for Child Anxiety Related Disorders (SCARED)

CHILD Version—Page 1 of 2 (to be filled out by the CHILD)

Developed by Boris Birmaher, M.D., Suneeta Khetarpal, M.D., Marlane Cully, M.Ed., David Brent, M.D., and Sandra McKenzie, Ph.D., Western Psychiatric Institute and Clinic, University of Pittsburgh *(October, 1995). E-mail:* birmaherb@upmc.edu

See: Birmaher, B., Brent, D. A., Chiappetta, L., Bridge, J., Monga, S., & Baugher, M. (1999). Psychometric properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED): a replication study. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*(10), 1230–6.

Name: _____ Date: _____

Directions:
Below is a list of sentences that describe how people feel. Read each phrase and decide if it is "Not True or Hardly Ever True" or "Somewhat True or Sometimes True" or "Very True or Often True" for you. Then, for each sentence, fill in one circle that corresponds to the response that seems to describe you *for the last 3 months*.

	0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True	
1. When I feel frightened, it is hard to breathe	O	O	O	PN
2. I get headaches when I am at school.	O	O	O	SH
3. I don't like to be with people I don't know well.	O	O	O	SC
4. I get scared if I sleep away from home.	O	O	O	SP
5. I worry about other people liking me.	O	O	O	GD
6. When I get frightened, I feel like passing out.	O	O	O	PN
7. I am nervous.	O	O	O	GD
8. I follow my mother or father wherever they go.	O	O	O	SP
9. People tell me that I look nervous.	O	O	O	PN
10. I feel nervous with people I don't know well.	O	O	O	SC
11. I get stomachaches at school.	O	O	O	SH
12. When I get frightened, I feel like I am going crazy.	O	O	O	PN
13. I worry about sleeping alone.	O	O	O	SP
14. I worry about being as good as other kids.	O	O	O	GD
15. When I get frightened, I feel like things are not real.	O	O	O	PN

16. I have nightmares about something bad happening to my parents.	O	O	O	SP
17. I worry about going to school.	O	O	O	SH
18. When I get frightened, my heart beats fast.	O	O	O	PN
19. I get shaky.	O	O	O	PN
20. I have nightmares about something bad happening to me.	O	O	O	SP

Screen for Child Anxiety Related Disorders (SCARED)

CHILD Version—Page 2 of 2 (to be filled out by the CHILD)

	0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True	
21. I worry about things working out for me.	O	O	O	GD
22. When I get frightened, I sweat a lot.	O	O	O	PN
23. I am a worrier.	O	O	O	GD
24. I get really frightened for no reason at all.	O	O	O	PN
25. I am afraid to be alone in the house.	O	O	O	SP
26. It is hard for me to talk with people I don't know well.	O	O	O	SC
27. When I get frightened, I feel like I am choking.	O	O	O	PN
28. People tell me that I worry too much.	O	O	O	GD
29. I don't like to be away from my family.	O	O	O	SP
30. I am afraid of having anxiety (or panic) attacks.	O	O	O	PN
31. I worry that something bad might happen to my parents.	O	O	O	SP
32. I feel shy with people I don't know well.	O	O	O	SC
33. I worry about what is going to happen in the future.	O	O	O	GD
34. When I get frightened, I feel like throwing up.	O	O	O	PN
35. I worry about how well I do things.	O	O	O	GD
36. I am scared to go to school.	O	O	O	SH
37. I worry about things that have already happened.	O	O	O	GD
38. When I get frightened, I feel dizzy.	O	O	O	PN
39. I feel nervous when I am with other children or adults and I have to do something while they watch me (for example: read aloud, speak, play a game, play a sport).	O	O	O	SC
40. I feel nervous when I am going to parties, dances, or any place where there will be people that I don't know well.	O	O	O	SC
41. I am shy.	O	O	O	SC

SCORING:

A total score of ≥ **25** may indicate the presence of an **Anxiety Disorder**. Scores higher than 30 are more specific. **TOTAL =**

A score of **7** for items 1, 6, 9, 12, 15, 18, 19, 22, 24, 27, 30, 34, 38 may indicate **Panic Disorder** or **Significant Somatic Symptoms**. **PN =**

A score of **9** for items 5, 7, 14, 21, 23, 28, 33, 35, 37 may indicate **Generalized Anxiety Disorder**. **GD =**

A score of **5** for items 4, 8, 13, 16, 20, 25, 29, 31 may indicate **Separation Anxiety SOC**. **SP =**

A score of **8** for items 3, 10, 26, 32, 39, 40, 41 may indicate **Social Anxiety Disorder**. **SC =**

A score of **3** for items 2, 11, 17, 36 may indicate **Significant School Avoidance**. **SH =**

For children ages 8 to 11, it is recommended that the clinician explain all questions, or have the child answer the questionnaire sitting with an adult in case they have any questions.

The SCARED is available at no cost at www.wpic.pitt.edu/research under tools and assessments, or at www.pediatric bipolar.pitt.edu under instruments.

March 27, 2012

Appendix D

Adverse Childhood Experiences

Please mark yes or no for whether your child in this study has ever experienced the following before and during the COVID-19 pandemic

	Before the COVID-19 Pandemic		**During the COVID-19 Pandemic**	
1. Lived with a parent or guardian who got divorced or separated	☐ No	☐ Yes	☐ No	☐ Yes
2. Lived with a parent or guardian who died	☐ No	☐ Yes	☐ No	☐ Yes
3. Lived with a parent or guardian who served time in jail or prison	☐ No	☐ Yes	☐ No	☐ Yes
4. Lived with anyone who was mentally ill, suicidal, or severely depressed	☐ No	☐ Yes	☐ No	☐ Yes
5. Lived with anyone who had a problem with alcohol or drugs	☐ No	☐ Yes	☐ No	☐ Yes
6. Saw or heard parents or other adults in the home slap, hit, kick, punch one another	☐ No	☐ Yes	☐ No	☐ Yes
7. Was a victim of violence or witnessed violence in the neighborhood	☐ No	☐ Yes	☐ No	☐ Yes
8. Experienced economic hardship “somewhat often” or “very often” (i.e., the family found it hard to cover costs of food and housing)	☐ No	☐ Yes	☐ No	☐ Yes
9. Treated or judged unfairly because of their race or ethnic group	☐ No	☐ Yes	☐ No	☐ Yes

Vita

Rebecca Hoppe was born on August 14th, 1991, in Point Pleasant, New Jersey and is a United States citizen. She received Bachelor of Arts degrees in Psychology and Spanish in May 2014 from Rider University. She worked in higher education at Rider University, Princeton University, and at the Foundation for Advanced Education in the Sciences at the National Institutes of Health in roles that promoted educational advancement and research opportunities to the next generation of scientists. At present, Rebecca is enrolled as a doctoral student in Developmental Psychology at Virginia Commonwealth University, Richmond, Virginia.