

COVID-19 Life Events Spill-Over on Family Functioning and Adolescent Adjustment

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Abstract

In this longitudinal study, we examined parent and youth perceptions of how life events, both positive and negative, associated with the COVID-19 pandemic resulted in changes in family functioning as well as youth functioning. We tested both direct effects of parent- and youth-reported negative and positive events as well as indirect or spillover effects that have their effects on parent functioning and marital relationships. Families (n=101 parent-youth dyads, 80% European American, 48% boys, and 87% mothers) completed surveys during the pandemic (May to July 2020) and 1.5 years prior. We conducted multivariate path analyses predicting residualized change in family and youth functioning. According to child-report of family functioning, open family communication, parent-child relationship quality and family satisfaction all decreased during this time, although no changes were found in parent-report of family functioning. Several forms of parent-reported negative life events and child-reports of school-related stress during the pandemic predicted changes in family functioning. Moreover, positive life events predicted child reports of family functioning directly and evidence for spill-over effects of parent-reported positive life events on family functioning were also found. In addition, the receipt of social support by parents during the pandemic protected against decrements in family functioning and, indirectly, increases in child symptomatology. School-related stress also predicted increases in child-reported symptomatology. Moreover, several aspects of family functioning pre-pandemic impacted the extent to which parents and children experienced both positive and negative life events during the pandemic. The current findings thus shed light on how experiences of the pandemic are linked with family functioning and have implications for how to support families during this time.

Background

The COVID-19 pandemic and associated public and governmental responses have led to rapid and at times drastic changes in the life of the family (e.g., Chung, Lanier, et al., 2020; Craig & Churchill, 2020; Gambin et al., 2020). Although some of these changes result in stressors that challenge family functioning (Chung, Chan et al., 2020; Fontanesi et al., 2020) others may offer opportunities to preserve or even bolster family functioning in the face of the pandemic (Orgilés et al., 2020). Emerging research from around the world documents the impact of the COVID-19 and previous epidemics/pandemics on families in terms of economic and resource loss, work-related stress, isolation and separation, illness and exposure concerns, caregiving burdens, and schooling needs for children (Ammar et al., 2020; Brooks et al., 2020; Brown et al., 2020; Chung, Lanier, et al., 2020; Craig & Churchill, 2020; Del Boca et al., 2020; Garcia de Avila et al., 2020; Hawryluck et al., 2004; Orgilés et al., 2020; Saurabh & Ranjan, 2020; Segre et al., 2020). Evidence that these stressors impact the mental and physical health of both parents and children is growing (Brown et al., 2020; DelBoca; Orgilés et al., 2020; Patrick et al., 2020; Saurabh; Segre et al., 2020; Xie et al., 2020). However, still unclear are how such stressors impact family systems, the factors that preserve family functioning during the pandemic, and the links between family functioning and youth mental health during this time. We address these issues in a longitudinal study of families who have youth in early to mid-adolescence and who reside primarily in the southeastern United States.

Pandemic Life Events as Family Stressors

Family Stress Models (Price, Bush, et al., 2016) suggest that one way in which the pandemic may be impacting family functioning is through negative life events experienced by individual family members themselves that in turn directly impact the family. Spillover models (Kouros, Papp, et al., 2014) suggest indirect effects as well, indicating that how parents respond to stress spills over into their relationships within the family such that aspects of family functioning (e.g., marital relationships and parenting behaviors) in turn impact children's adjustment. Parenting stress models extend spillover models to also suggest that the ways in which children manage stress can impact family systems, including by evoking parenting behaviors that shape family relationships, family conflict, and parental functioning (Zemp, Nussbeck, et al., 2017). Together, these models posit that stressors for any one family member impact the functioning of the family system more generally, with implications for the adjustment of each individual family member in turn. With the far-reaching life events linked with the COVID-19 pandemic (Brooks et al., 2020), the impact of stressors may be amplified by simultaneous direct effects on each family member as well as the family system and indirect influences on relationships and individuals within the family. In this way, pandemic stressors may echo in the family, creating cycles of disruption in family processes and relationships that impact individual functioning and adjustment.

As one key example of a broad pandemic stressor, families around the world report being affected by quarantine and mandatory social distancing (Brooks et al., 2020). These quarantine practices result in challenges to work-family balance through less support for parents from employers and spouses (Chung, Lanier, et al., 2020; Craig & Churchill, 2020), unemployment (Brown et al., 2020), online schooling demands (Segre et al., 2020), and increased caregiver burden (Russell et al., 2020; Patrick et al., 2020). Although quarantine may entail spending more time at home with family, Ammar et al. (2020) found that family members in Asia, Africa, and Europe reported feeling more socially isolated as a result of fewer opportunities to visit with family outside of the home as well as friends and neighbors during quarantine.

There is mounting evidence that such pandemic stressors are associated with a host of changes in individual functioning. COVID-related changes have been associated with greater parental stress as well as mental health symptoms including anxiety and depression (Chung, Lanier et al., 2020; Fontanesi et al., 2020; Patrick et al., 2020). For children, COVID-related changes include more symptoms of depression, anxiety, sleep difficulties and school-related stress (Garcia de Avila et al., 2020; Hussong et al., 2020; Xie et al., 2020; Zhou et al., 2020). Pandemic-related changes in family functioning, however, have been less studied than changes in individual family member's functioning. Yet, emerging findings suggest that the pandemic has increased marital strain and parental stress leading to harsher parenting and weakening parent-child relationships (Chung, Chan et al., 2020; Chung, Lanier, et al., 2020; Fontanesi et al., 2020).

In addition, recent scholarship has investigated the ways in which certain types of pandemic stressors are impacting family and individual functioning. Craig and Churchill (2020) found that the quarantine period was associated with increased burden in household labor and that Australian mothers and fathers reported a greater dissatisfaction with how that labor was divided during the pandemic. Moreover, Chung, Chan et al. (2020) found that Singaporean couples with strong support from spouses and employers experienced less marital and parental stress during the pandemic and, in turn, better work-family balance was associated with lower parenting stress and decreased marital conflict. Thus, emerging studies show that pandemic stress and changes in family

functioning are impacting individual functioning. Yet, we know little about how pandemic stress is impacting family functioning itself or how pandemic stressors might have spillover effects in families, impacting other family members indirectly.

Family Functioning and Pandemic Stress

In the current study, our focus on pandemic stress was guided by hypotheses regarding how such stressors impact multiple levels of family functioning and how family functioning, in turn, impacts youth adjustment. In so doing, we examined three aspects of family functioning that capture the overall family climate (i.e., overall satisfaction with the family), a key family process linked with other indicators of healthy family functioning (i.e., open family communication), and the salient dyadic relationship within the family impacting youth development (i.e., parent-child relationship quality). These three components reflect operationalizations of family resilience, as noted by Walsh (2006), to include family cohesion (here indexed through high quality parent-child relationships), family beliefs (including having a positive outlook on the family or, here, satisfaction), and coping strategies (such as the use of open communication).

To our knowledge, studies of the current pandemic's impact on family satisfaction, as a broad indicator of overall family functioning, remain forthcoming. Although studies regarding family communication and COVID-19 are also yet to emerge, commentaries stressing the importance of open communication have appeared. For example, Gambil et al. (2020) suggest that quarantining during the pandemic provides a unique opportunity for families to talk about their emotions. Other commentators agree that parents who communicate with their children in a calm, honest, and direct manner may mitigate the possibilities of triggering stress disorders (Dalton, Rapa, et al., 2020; Roccella, 2020). Parent-child relationship quality, on the other hand, has been the focus of early empirical studies on family functioning during the pandemic. Notably, Russell et al. (2020) found that child stress was linked with greater parent-child relationship conflict and less closeness. Moreover, these negative effects were worse in families where caregivers reported more distress.

In sum, there is reason to believe that various forms of pandemic stress will impact family functioning, including through broad indicators of healthy family climate (family satisfaction) and family process (open communication) as well as more specific indicators of relationship functioning (parent-child relationship quality), which in turn may impact youth functioning. For this reason, we examined whether there were changes in each of these three dimensions of family functioning from pre-pandemic to during the pandemic and whether these changes were associated with specific forms of parent- and child-reported pandemic-stress (positive and negative life event changes).

Spill Over

Relying on prior work by Cummings and colleagues (Kouros et al, 2014; Zemp et al., 2017), Liu and Doan (2020) note that COVID-related stressors, such as those related to parents' work or children's online schooling, may "spillover" into family life, affecting marital, parent-child and sibling relationships. Emerging studies indeed show that greater parental stress is related to higher rates of symptomatology during the pandemic for children (Russell et al., 2020; Brown et al., 2020; Romero et al., 2020; Origlés et al., 2020) and that pre-existing child symptomatology predicted greater stress for families during the pandemic (Spinelli et al., 2020). For instance, children whose parents experience greater stress during the pandemic show greater changes in mood and behaviors (Orgilés et al., 2020; Romero et al., 2020) as well as increased stress and parent-child conflict (Russell et al., 2020; Spinelli et al., 2020).

These effects are commonly discussed with respect to parental stress spilling over to impact children via their influence on family functioning (Kouros et al., 2014). For instance, parental stress resulting from the pandemic has been found to be associated with children's stress and in turn to impact parent-child conflict (Russell et al., 2020; Spinelli et al., 2020). Untested for the current pandemic are 1) whether spillover effects are occurring through parents' pandemic-related stress on family functioning that in turn impacts child functioning, 2) what types of stressful events are more likely to result in spillover effects, and 3) what aspects of family functioning are more likely to mediate this effect. In addition, less is known about how child stressors are spilling into the family, although Russell et al. (2020) found that child stress was linked with greater parent-child relationship conflict and less closeness during the pandemic. Moreover, evidence of greater school-related stressors, illness related concerns, and isolation (Ammar et al., 2020; Saurabh & Ranjan, 2020) have been linked with child distress and symptoms and, as in past quarantine periods, may be traumatic for youth (Sprang & Silman, 2013).

In sum, family stressors are expected to have broad effects on family functioning both directly as well as through spillover effects. Although little research has examined what type of stressors may produce as spillover effects, prior work on parental role conflict (work-family) and caregiver burden may be particularly relevant to COVID-19 life events that predict parental stress and in turn child functioning. In addition, school-related concerns may play a similar role in creating child stress that impacts family functioning and parenting stress.

Protective Factors

The impact of quarantine practices, involving more social isolation from those outside the family but potentially greater contact with those inside the family home, are posited to have diverging implications for individual and family functioning. Carroll et al. (2020) found that some parents are eating healthier and involving their families in meal preparation and spending dinners together, reporting less stress getting ready for school and viewing their children as positively adapting to the pandemic, although others are struggling. The extent to which parents receive social support from outside the family may impact positive changes (or few decrements) in family functioning during the pandemic. For example, Gambil et al. (2020) found that Polish parents' own social support helped promote positive parent-child relationships during COVID-19 and that such measures can be utilized to promote family closeness during lockdown. Individuals with strong support from spouses and employers and a positive work-life balance during the pandemic also report less marital and parental stress than those with lower levels of support and less balance (Chung, Chan, et al., 2020). Similarly, Brown et al. (2020) found that parents who received more support from others reported less perceived stress. Whereas some commentators suggest that greater time together under pandemic stress may result in greater conflict in some families (Buttell & Ferreira, 2020; Campbell, 2020), others note the potential for greater closeness in other families (Gambil et al.,

2020). Such family level protective factors or positive life event changes during the pandemic, however, have received little attention in the literature despite their potential to inform family support programming.

The Current Study

The current study uses data from an existing longitudinal study with assessments occurring before the pandemic and during the first months of the pandemic onset (May to July, 2020) to assess changes in family functioning as well as associated stressors and youth functioning. Our analyses tested six hypotheses. First, that family functioning is impacted by the pandemic, with risk factors associated with decrements in family functioning from pre-pandemic to during the pandemic (hypothesis 1). We posit that these changes in family functioning are related to both negative and positive life events that are associated with the pandemic and that impact parents and children, either impairing functioning or protecting families from decrements in functioning, respectively (hypothesis 2). In addition, we anticipate that parental life events may impact family functioning via a spill-over process, in which negative life events lead to negative changes in parental mental health functioning and less marital satisfaction. Decrements in parent functioning and marital relationships in turn are expected to predict poorer family functioning (hypothesis 3). However, the presence of greater social support for parents may forestall decrements in parental functioning and marital satisfaction, and in turn, family functioning (hypothesis 4). Changes in family functioning, resulting from these risk and protective processes in aggregate, are posited to then predict changes in child mental health symptoms from pre-pandemic to during the pandemic (hypothesis 5). Finally, we explore whether pre-pandemic family functioning predicts different forms of pandemic-related stress that in turn predict residualized change in family functioning during the pandemic (hypothesis 6).

Method

Participants and Procedures

Participants from the BLINDED study (BLINDED) comprised the sample for this longitudinal analysis. We originally recruited participating parents and children from North Carolina, USA in 2013-2014 through mass emails to faculty, staff, and students at an affiliated university, flyers distributed through public and independent schools in first- to third-grade classrooms, and community postings. Inclusion criteria were English proficiency and having a child aged 6-9 years.

A total of 101 dyads participated at wave 1 in a lab-based data collection and short-term follow-up survey (waves 1 and 2) and 98 participated in a 1.5 year follow-up online parent survey (wave 3). At wave 4, 94 participants (90 of the original sample plus 4 retained pilots) completed a lab-based data collection followed either immediately or after one month by an online parent training program in gratitude socialization (with related assessments for waves 5-8). All but seven of the dyads in the analysis sample completed the program. For wave 4, we attained consent/assent before parents and children completed computerized surveys in separate rooms (in addition to subsequent lab tasks). Wave 9 occurred three years later with 90 parents and 88 children from 91 families completing 45-minute online surveys between May 13, 2020 and July 1, 2020. Each received \$25 for participating. All research activities received institutional review board approval.

The analysis sample included parent-child dyads who participated in either or both data collection efforts just before (wave 4) or during (wave 9) the pandemic, resulting in 101 families. These families included 85 families present in both waves, 11 in wave 4 only and five in wave 9 only. (Necessitating missing data analysis, see below.) Sample characteristics include: 48% boys; 80% European American, 1% Alaska Native/American Indian, 9% Asian/Asian American, 4% Black/African American, 4% Latinx, and 4% other; 87% mothers; 25% high school graduate without college education, 30% degree from 4-year college, 45% graduate or professional school graduate; child age at wave 4=8-13 ($M=10.6$) and at wave 9=12-16 ($M=13.6$).

Measures

Parents reported their child's *gender* and *age* (0=female) as well as their own race/ethnicity (1=racial/ethnic minority or multi-racial identity). We standardized and then averaged five items to index *socioeconomic status*, including parent report at wave 1 of: (1) approximate family income from the previous year ranging from 0 (\$9,999 or less) to 13 (\$200,000 or more); (2 and 3) educational attainment of each parent using an 8-point scale that ranged from 1 (some high school) to 8 (completed graduate or professional degree); and, (4 and 5) the MacArthur scale of subjective social status in which parents indicated their own socioeconomic status relative to individuals in the US broadly as well as the socioeconomic status of their family of origin (Adler & Stewart, 2007; score $M=0$; $SD=.72$). Because all but seven of our families completed the online gratitude training program between waves 4 and 9, we also included an indicator of *program participation* as an additional control variable. We examined these five indicators as potential covariates in our analyses.

Pediatric Symptom Checklist. The Pediatric Symptom Checklist was used to assess parent- and child-report of child symptomatology (Jellinek et al., 1988) at waves 4 and 9. Respondents indicated how often in the past month the child had exhibited thirty-five internalizing, externalizing, and attentional symptoms on a scale ranging from 0 (never) to 2 (often). Items were averaged at each wave to characterize children's overall symptomatology, with higher scores indicating greater child impairment. (See Table 1 for descriptive statistics for all measures).

Parent-Child Relationship Quality. Parent-child relationship quality was assessed using eight items from the Arizona Social Support Interview Schedule (ASSIS; Barrera et al., 1981) administered to children and parents at waves 4 (using the original past three month directions) and 9 (using a past month timeframe to capture the pandemic period). At wave 4, children separately rated their relationship with each of two caregivers (typically mother and father) when applicable but rated both relationships together at wave 9. Wave 4 child-reports for each caregiver were highly correlated and averaged to form a single scale score ($r=.48$, $p<.001$). For both parents and children, item responses ranged from 1 (little or none) to 5 (the most possible). A mean of items comprised scale scores within reporter, including the reverse scored-conflict item, with higher scores suggesting more positive relationship quality.

Parent's Marital Satisfaction. The respondent's marital satisfaction was assessed using the eight item Relationship Assessment Scale (RAS; Hendrick, 1988) by parent report at wave 4 (with the original directions not indicating a timeframe) and 9 (using a past month timeframe). Participants responded to four items

assessing relationship satisfaction with responses ranging from 1 (very low satisfaction) to 7 (very high satisfaction) as well as how often they regretted the relationship and how much they loved their partner on two items ranging from 1 (not at all) to 7 (a great deal). On a single (reverse-scored) item, participants reported how many problems existed in their relationship with responses ranging from 1 (none) to 7 (very many). Items were averaged to create scores for analyses, with higher scores indicating greater marital satisfaction.

Family Satisfaction. Both children and parents reported on family satisfaction using the Family Satisfaction Scale (FSS; Barnes & Olson, 1985). Reporters indicated the extent to which they agreed with ten items with responses ranging from 1 (strongly disagree) to 5 (strongly agree) using the original directions without a time frame in wave 4 and in the past month in wave 9. Items were averaged to form scale scores for subsequent analyses, with higher scores indicating greater satisfaction.

Family Open Communication. Parents and children reported on open family communication using 10 items from the Family Communication Scale (FCS; Olson & Barnes, 2010). Participants rated agreement with responses ranging from 1 (strongly disagree) to 5 (strongly agree) using the original directions without a time frame in wave 4 and in the past month in wave 9. A mean of items served as scores for subsequent analyses, with higher scores indicating more open communication.

Parent Social Support Scale. At wave 9, parents completed an abbreviated version of the social support scale from the Support Provision Scale (Cutrona & Russell, 1987; Iapichino et al., 2016). Participants rated ten items assessing how well statements described support derived from relationships with others in the past month (e.g., family members, friends, or coworkers) using a scale ranging from 1 (strongly agree) to 4 (strongly disagree). A mean of items served as scores for subsequent analyses, with higher scores indicating more social support.

Child COVID-19 Negative and Positive Life Events. Children indicated whether or not they experienced each of 27 COVID-related life stressors and, for those experienced, rate how desirable they found each to be on a scale of -4 (extremely bad) to 0 (neither good or bad) to 4 (extremely good). Items were derived from the Responses to Stress Questionnaire-COVID-19, an adaptation of the original Responses to Stress Questionnaire for COVID-19 (Compas, 2020; Connor-Smith et al., 2000). Eleven items assessing positive life events were rescored as ranging from 0 (from extremely bad to neither good nor bad, although few negative ratings were reported) to 4 (extremely good) and assessed more time outside, finding ways to help people, more time for hobbies and creative activities, more connection to others, etc.. Negative life events were rescored as ranging from 0 (from extremely good to neither good nor bad) to 4 (extremely bad) and assessed school stress (difficulty completing online schoolwork and unable to complete school work requirements), illness concerns (not sure about self or others getting COVID-19), or isolation (unable to spend time with friends or participate in social activities). An average of items on each standardized subscale served as scores for subsequent analyses and an average of the three standardized negative stress scales formed an overall negative stress score.

Parent Negative and Positive Life Events and Pandemic-Related Changes in Parental Functioning. Parents completed the Epidemic-Pandemic Impacts Inventory (Grasso et al., 2020) at wave 9. Parents rated whether they had experienced each of 92 COVID-related events. For purposes of this study, we dropped items that directly overlapped with changes in family functioning and created subscales that captured seven scales: positive life events (19 items; e.g., "found greater meaning in work" or "volunteered time to help people in need"), work/school stress (four items; e.g., "increased workload"), economic/resource loss (five items; e.g., "laid off from job"), isolation/separation (15 items; "isolated or quarantined due to possible exposure to this disease"), illness concerns (four items; e.g., "had symptoms of this disease but never tested"), caregiving stress (nine items; e.g., "childcare or babysitting unavailable when needed"), and medical provider stress (four items; e.g., "provided direct care to people with the disease"). Scales assessing economic resource/loss, COVID-19 exposure risk, and medical provider stress were scored dichotomously due to lower base rates. Other scales were scored as the proportion of items endorsed. An overall negative stress scale was formed by averaging standardized negative scale scores.

Twelve additional items on this scale indexed changes in parental functioning related to COVID-19, each rated as occurring or not and then averaged to form this scale. Items assessed, for example, changes in mental health, sleep, physical activity, and need for medical care.

Analytic Plan

To test changes in family functioning by parent- and child-report from pre-pandemic (wave 4) to during the pandemic (wave 9), we conducted a series of within-person t-tests for family functioning indicators (see Table 2; hypothesis 1). We then tested hypotheses 2-5 simultaneously using a model building approach in which we first examined parent- and child-report variables in separate analyses (see Figures 1 and 3). To account for missing data, we generated and synthesized 100 imputations using Mplus (Muthén & Muthén, 1998-2019). We then evaluated potential covariate effects by regressing all endogenous variables for a given model on parent race/ethnicity, child gender, child age, family socio-economic status and prior program participation retaining pathways significant at $p < .10$.

In Model 1, we tested hypotheses 2-5 using parent-report variables. Family functioning variables assessed at wave 9 (open family communication, parent-child relationship quality, and family satisfaction) were regressed on parallel variables at wave 4, in order to examine predictors of residualized change in family functioning during the pandemic. Positive and negative parent-reported life events were correlated with wave 4 family functioning indicators as exogenous variables. The three indicators of family functioning at wave 9 and changes in parental functioning were also regressed on the two forms of life event indicators and marital satisfaction was regressed on changes in parental functioning (Estimated Model in Figure 1). In Model 2, we tested hypothesis 2 and 5 only using child-report variables (as parent-report variables only were available to test hypothesis 3-4). Child symptoms were regressed on the three indicators of family functioning which were regressed on positive and negative life events.

To examine the impact of different forms of negative life events and to test hypothesis 6, we estimated a parent-report model using the three indicators of family functioning at wave 4 as predictors of parent-reported stressors (work, economic, isolation, illness concerns, caregiving, and medical provider) which in

turn predicted residualized change in the three indicators of family functioning at wave 9 (Model 3). A parallel child-report model included the negative stressors of isolation, illness concerns, and school-related stressors with child-reports of the three indicators of family functioning (Model 4).

The final four models examined hypotheses 2-6 in cross-reporter analyses. These models tested whether the hypothesized full model using parent-report variables (in Figure 1) predicted residualized change in child-reported symptomatology (Model 5) and whether child-report of variables in this model (from Figure 3) predicted parent reports of child symptomatology (Model 6). These models also tested whether child-reported life events (from Figure 5) predicted residualized change in parent-reports of family functioning indicators (Model 7) and whether parent reports of negative life events (from Figure 4) predicted residualized change in child-reports of family functioning indicators (model 8).

Results

Preliminary Analysis

Descriptive analyses of primary variables are reported in Table 1.

Hypothesis 1: Changes in Family Functioning Pre-to During-the-Pandemic

We conducted a series of within-person t-tests to examine changes in levels of each indicator of family functioning from wave 4 to wave 9. As reported in Table 2, only child-report variables demonstrated significant change over this time; decreases were noted in family open communication, parent-child relationship quality, and family satisfaction. Note that wave 9 child reported variables were not significantly correlated with child age.

Hypothesis 2-5: Parent-Report Full Hypothesized Model

Results of the covariate model regressing all endogenous variables (marital satisfaction, changes in parent functioning, the three indicators of family functioning, and child symptoms) on five potential covariates (child age, gender, parent race, family socioeconomic status, and program completion or not) showed only one significant finding. COVID-related changes in parent functioning were greater when the target child was older ($b=.18$; $t=1.98$; $p<.05$). Model 1 (see Figure 2) was thus estimated including this covariate pathway and with the broad indicators of positive and negative COVID-related life events. The resulting model provided an acceptable fit to the data ($\chi^2(32)=53.18$, $p<.05$; RMSEA=.08; CFI=.95; SRM=.05). Negative and positive life events were not directly related to residualized change in family functioning indicators, although spillover effects emerged. There were positive spillover effects such that greater positive life events predicted greater marital satisfaction ($b=.20$; $t=2.61$; $p<.01$) as did greater social support for parents ($b=.23$; $t=2.24$; $p<.05$). Marital satisfaction was in turn associated with greater parental family satisfaction ($b=.30$; $t=2.22$; $p<.05$). Greater parent social support also predicted more positive (or fewer decrements) in parent-child relationship quality during the pandemic ($b=.21$; $t=1.93$; $p<.05$), which in turn predicted less child symptomatology ($b=-.31$; $t=-3.08$; $p<.01$; hypothesis 5). Although not associated with family functioning, more impairment in parental functioning associated with COVID-19 was associated with parents reporting more negative COVID-related stressors ($b=.34$; $t=3.47$, $p<.001$), and although only marginally, fewer positive life events ($b=-.16$; $t=-1.76$, $p=.08$) and having older children in the study ($b=.18$, $t=-1.82$, $p=.07$).

Hypothesis 2 and 5: Child-Report Full Hypothesized Model

Results of the covariate model regressing all endogenous variables (the three indicators of family functioning and child symptoms) on the five potential covariates showed no significant associations. Model 2 was thus estimated without covariates and provided an excellent fit to the data ($\chi^2(13)=14.33$, $p>.05$; RMSEA=.03; CFI=.99; SRM=.03). Results for the child-report model testing effects of negative and positive life events on family functioning and in turn child symptoms, showed that negative life events did not predict residualized change in family functioning but they did predict greater elevation in child symptoms from pre- to during the pandemic ($b=.31$; $t=4.55$, $p<.001$ see Figure 3). In addition, experiencing positive COVID-related life events related to fewer decrements in open family communication ($b=.25$; $t=2.72$, $p<.01$) and parent-child relationship quality ($b=.24$; $t=2.84$, $p<.01$) from before to during the pandemic.

Hypothesis 6: Parent-Report Model

Results of the covariate model regressing all endogenous variables (the six negative stressors and three family functioning indices) on the five potential covariates showed greater illness concerns for parents who identified as a racial/ethnicity minority ($b=.38$; $t=3.25$, $p<.001$) and greater medical provider stress for families with higher socio-economic status ($b=.22$; $t=2.41$, $p<.05$). These effects were retained in Model 3 in which effects of pandemic-related stressors on residualized change in family functioning were estimated as well as associations between pre-pandemic family functioning and the six types of negative pandemic stressors (see Figure 4). Note that parent-report of child symptoms was not retained in this model given the lack of association between stressors and symptoms in Model 1 and the need to reduce model complexity.

The resulting model provided an acceptable fit to the data ($\chi^2(19)=30.17$, $p>.05$; RMSEA=.08; CFI=.96; SRM=.04). Decreased family communication was related to more parent caregiving stress ($b=-.19$; $t=-2.20$, $p<.05$) and, although marginally significant, more illness concerns ($b=-.17$; $t=-1.83$, $p=.07$). However, medical provider stress ($b=.23$; $t=2.83$, $p<.01$) was related to increases (or fewer decrements) in family communication as was greater isolation stress, although this was only marginally significant ($b=.15$; $t=1.53$, $p=.10$). A decrease in parent-child relationship quality was related to greater work stress ($b=-.20$; $t=2.25$, $p<.05$), although, like family functioning, greater isolation stress ($b=.18$; $t=2.09$, $p<.05$) and (at marginal significance) medical provider stress ($b=.15$; $t=1.90$, $p=.06$) were related to increases (or fewer decrements) in parent-child relationship quality. Greater caregiving stress showed a marginally significant association with decreases in family satisfaction ($b=-.17$; $t=-1.71$, $p=.09$).

In addition, family functioning impacted the likelihood of experiencing pandemic-related stressors. Greater open family communication pre-pandemic predicted more work stress ($b=.31$; $t=2.41$, $p<.05$) and (at marginal significance) isolation stress ($b=.29$; $t=1.84$, $p=.07$) as well as fewer illness concerns ($b=-.28$;

$t=2.21, p<.05$) during the pandemic. Stronger parent-child relationship quality predicted greater risk for illness concerns, although at marginal significance ($b=.19; t=18.6, p=.06$). Greater family satisfaction pre-pandemic predicted less work stress ($b=-.40; t=-3.14, p<.01$), caregiving stress ($b=-.35; t=-2.30, p<.05$), and (at marginal significance) isolation stress ($b=-.31; t=-1.80, p=.07$) during the pandemic. And racial/ethnic minority status predicted greater illness concerns ($b=.25; t=2.24, p<.05$) and higher socioeconomic status predicted greater medical provider stress ($b=.20; t=2.03, p<.05$).

Hypothesis 6: Child-Report Model

Results of covariate models for the child-report analysis regressing all endogenous variables (three negative and one positive life event indicator, three family functioning indices, and child symptoms) on the five potential covariates showed that girls reported greater stress during the pandemic due to isolation ($b=-.57; t=-3.03, p<.01$), illness concerns ($b=-.56; t=-2.81, p<.01$), and school-related stress ($b=-.38; t=-1.94, p=.05$). Higher family socioeconomic status predicted less isolation stress ($b=.31; t=2.21, p<.05$), greater positive events during COVID-19 ($b=.44; t=3.28, p<.001$) and lower child symptomatology during the pandemic ($b=-.08; t=-1.93, p=.05$). Controlling for these effects, Model 4 provided an excellent fit to the data ($\chi^2(20)=23.91, p>.05$; RMSEA=.04; CFI=.99; SRM=.03; see Figure 5). Results showed that children with more symptomatology pre-pandemic had more school-related stress during the pandemic ($b=.36; t=3.28, p<.001$) which predicted greater increases (residualized change) in child symptoms during the pandemic ($b=.17; t=1.96, p<.05$). Positive events continued to predict greater open family communication ($b=.25; t=2.62, p<.01$) and more positive parent-child relationship quality ($b=.23; t=2.75, p<.01$). Girls continued to report more isolation ($b=-.33; t=-3.63, p<.001$) and illness concerns ($b=-.25; t=-.47, p<.05$) during the pandemic and higher socio-economic status predicted more positive events ($b=.23; t=2.75, p<.01$).

Testing Cross-Reporter Effects (Models 5-8)

We first examined the full hypothesized model using parent-report variables to predict child-reported symptoms (testing hypotheses 2-5) by re-estimating Model 1 (shown in Figure 2) replacing parent- with child-report symptoms (Model 5). No cross-reporter effects on parent-report of child symptoms were found, although model fit was acceptable ($\chi^2(32)=49.98, p<.05$; RMSEA=.07; CFI=.95; SRM=.04). We then conducted a parallel model (Model 6) in which we tested whether child-report variables in the full hypothesized model predicted self-report of child symptoms (Model 2, shown in Figure 3). Model fit was again excellent ($\chi^2(13)=17.49, p>.05$; RMSEA=.05; CFI=.98; SRMR=.04) but no effects on parent-reports of child symptoms were found.

We next tested cross-reporter effects for models evaluating hypothesis 6. We re-estimated Model 3 (show in Figure 4) replacing parent-reported stressors with child-reported stressors ($\chi^2(13)=19.91, p>.05$; RMSEA=.07; CFI=.98; SRM=.04; Model 7). Greater child-reported school stress predicted decrements in parent-reports of parent-child relationship quality ($b=-.10; t=-2.35, p<.05$), although no other effects of child-reported stressors on changes in parent-reported family functioning were found. Higher parent-reported parent-child relationship quality pre-pandemic also predicted greater isolation stress by child reported during the pandemic ($b=.30; t=2.55, p<.05$). In addition, lower parent-reported open family communication ($b=-.27; t=-2.22, p<.05$) and, unexpectedly, higher family satisfaction ($b=.31; t=2.20, p<.05$) predicted greater child-reported school stress during the pandemic.

We then re-estimated Model 4 (shown in Figure 5) replacing child-reported life events with the six parent-reported negative stressors ($\chi^2(27)=47.79, p<.05$; RMSEA=.09; CFI=.92; SRM=.07; Model 8). Parent-reported medical stressors predicted greater child-reported family open communication ($b=.22; t=2.34, p<.05$), positive parent-child relationship quality ($b=.18; t=2.16, p<.05$), and (although only marginally significant) higher family satisfaction ($b=.15; t=1.65, p=.10$). In addition, greater open family communication pre-pandemic predicted less caregiving stressors by parent-report during the pandemic ($b=-.21; t=-1.98, p<.05$) and a marginally significant effect was found for child-reported family satisfaction to lower medical provider stress during the pandemic by parent report ($b=-.25; t=-1.75, p=.08$).

Discussion

The current longitudinal study examined changes in family functioning in the southeastern US from pre-pandemic into the early months of the pandemic, along with pandemic-related processes that both impair and safeguard functioning, and the implications of changes in family functioning for child symptomatology. According to child-report of family functioning, open family communication, parent-child relationship quality and family satisfaction all decreased during this time, although no changes were found in parent-report of family functioning (hypothesis 1). Several forms of parent-reported negative life events and child-reports of school-related stress during the pandemic predicted changes in family functioning. Moreover, positive life events predicted child reports of family functioning directly and evidence was found for spill-over effects of parent-reported positive life events on family functioning (hypothesis 2 and 3). In addition, the receipt of social support by parents during the pandemic protected against decrements in family functioning and, indirectly, increases in child symptomatology (hypotheses 4 and 5). School-related stress, on the other hand, predicted increases in child-reported symptomatology (hypothesis 5). Finally, several aspects of family functioning pre-pandemic impacted the extent to which parents and children experienced both positive and negative life events during the pandemic (hypothesis 6). Thus, the current findings shed light on how experiences of the pandemic are linked with family functioning.

The importance of examining multiple reporters in understanding family processes is once again evident in the current study, most notably in the consistent decrements in family functioning that were found across indicators for child- but not parent-report from pre-pandemic to the first months of the pandemic quarantine period. Such differences may be due to several factors. For example, parents may adjust their expectations and ratings for family functioning during the pandemic whereas children may not include such allowances for context. In addition, these younger teens may find the increased time with family confining, restricting their goals for autonomy and independence, and, as a result, experience family functioning more negatively than do parents.

Although the current findings cannot distinguish these differences, results do provide insights into factors that may improve or protect against pandemic-related decrements in family functioning as well as consequences of such decrements. First, more open family communication and better parent-child relationship quality were associated with child-reported positive events, including spending time with people, being active, spending time outside, and engaging in hobbies and creative activities. Second, parental social support both directly protected parent-child relationships during the pandemic and

indirectly increased family satisfaction by increasing marital satisfaction. This finding underscores that spillover effects, including those related to parents receiving social support in particular, may not only improve family functioning by their impact on marital relationships but also protect children against pandemic-related increases in symptomatology by reinforcing the quality of the parent-child relationship. And, third, parents reporting greater isolation in these early months of the pandemic quarantine also reported a more positive parent-child relationship, perhaps due to welcome family togetherness, although child-reports showed no such effect. In general, these findings suggest that remaining positively engaged with others, seeking and receiving social support, and remaining physically and mentally engaged in activities may all be important ways to improve individual health (as previously suggested, Kilgore et al., 2020) but also family functioning in the face of stressors associated with the pandemic.

A somewhat surprising finding was that stress associated with having a parent actively engaged in providing medical care for those impacted by COVID-19 was also protective against decrements in family functioning during the pandemic. This form of family stress was associated with more open family communication and a stronger parent-child relationship during the pandemic, by both parent and child report. In these early months of the pandemic quarantine in particular, such families may have been privy to more accurate information about the pandemic and have talked more openly about this information. Families may rally around parents in frontline jobs and such parents may especially value family support and their relationships with children as they face the daily realities of the pandemic at work. Thus, although such care providers clearly have experienced significant stress and demands in their work that impact them in other ways (Craig & Churchill, 2020), for some these experiences may bring their family closer or at least protect against pandemic-related decrements in family functioning during this time.

Findings for this study also affirm some of the sources of stress that appear to have impaired family functioning as the pandemic quarantine unfolded. For youth, none of the negative life event domains (isolation, illness concerns, and school) predicted changes in family functioning, although greater school stress predicted increased symptomatology. Pandemic-related work and caregiving stressors were most impactful for parents, with work stress associated with decreased parent-child relationship quality and caregiving stress with less open family communication and, to some extent, family satisfaction. These stressors underscore the extreme challenges to family-work balance that parents are facing and that impact families as a whole (Craig & Churchill, 2020).

In terms of how these processes impact youth, we saw limited direct effect of pandemic-related life events on child symptomatology although school-related stressors increased child-reported symptomatology. On the other hand, more positive parent-child relationship quality protected against increased symptomatology. However, as rising trends in youth mental health problems have begun to emerge as the pandemic and corresponding safety measures continue (e.g., Garcia de Avila et al., 2020; Jiao et al., 2020; Xie et al., 2020), changes in how these family processes impact youth functioning are likely to emerge as well. For example, it is important to note that decisions about Fall 2020 in-person school closures and the move to digital learning that occurred in this area had yet to be announced at the time of this data collection.

In addition, findings from this study suggest that aspects of family functioning prior to the pandemic may serve to protect or leave family members vulnerable to pandemic-related stressors. Most notably, family satisfaction pre-pandemic as reported by parents and open family communication as reported by children resulted in less parent role stress (work and caregiving) during the pandemic. Open family communication as reported by parents also resulted in fewer illness concerns, perhaps by providing ready skills for discussing the uncertainties and challenges of the pandemic as well as illness stressors within the family.

We also found that, as compared to boys, girls were more vulnerable to isolation stress and, along with racial/ethnic minority families, illness concerns. Finally, families with a relatively higher socio-economic status reported greater medical provider stress and child-reports of positive life events. These findings parallel reported disparities in COVID-19 exposures and impact in the literature, with greater negative stress for racial/ethnic minority families and more protective factors for families with greater socio-economic resources (Abedi et al., 2020) even within this relatively privileged sample.

Limitations

Strengths of this study include the use of a longitudinal design, the use of multiple reporters, and the consideration of various domains of life events that can pose both risk and protective effects on families coping with the pandemic. Limitations include the presence of only two time points, inclusion of a single parental perspective (often mothers) and no siblings, and restricted diversity in the sample. This last point is particularly important given that the pandemic has disproportionately impacted racial/ethnic minority families and low socio-economic families (Abedi et al., 2020). Understanding how the pandemic has impacted a wide range of families, both within the US and across the globe, will be critical in supporting the developmental recovery of youth and their families in the years to come. Thus, the current study offers a snapshot of how the pandemic has impacted a relatively privileged sample as one of many needed contributions to this research.

As future research continues to examine these questions, these findings underscore the importance of longitudinal data that can address temporal precedence and developmental progression as well as multiple reporter data, given differences in perspectives (and the potential for reporter bias) particularly in family research. Indeed, the most salient finding across reporters was the protective effects on family functioning of having a frontline medical provider as a parent. This finding suggests that families who experience pandemic-related stress through an exposed caretaker may be finding ways of engaging in family processes that are adaptive to this unique context, perhaps identifying approaches that may be useful for families who experience related stressors. Further research into the family-level coping strategies of this subgroup could thus be useful for service planning.

These findings have other implications for supporting families during the COVID-19 pandemic and related crises. First, as reported elsewhere, there are predictable differences in the stressful life events to which families may be exposed. Families with fewer resources and those who may be marginalized due to race/ethnicity are experiencing more negative illness-related impacts of the pandemic and fewer of the positive life events, which may require more time and money to access. Some youth, in the current study girls rather than boys, may also be more susceptible to the social changes of the pandemic that include more isolation. Understanding the long-term impact of such isolation on youth development and the role of families in mitigating that risk is an important research agenda, just as finding ways to help youth stay connected is a clear service implication of these results.

Second, helping families, not only youth, stay connected to others who provide support is important for parent, family, and child functioning. The closure of work spaces, leisure spaces, and community spaces (public parks, churches, etc.) has the potential to limit the amount of social support and contact that parents have as they navigate their lives during the pandemic. Seeking social support under quarantine and social distancing practices likely requires more active, intentioned behavior from parents who may feel squeezed for time. Encouraging and facilitating social support seeking for parents, however, is not simply a matter of self-care but also of family-care.

Third, these findings also suggest that helping families maintain positive parent-child relationships and reduce school-stress, sometimes competing goals when parents become teachers and enforcers for online learning, are both important avenues for reducing increases in symptomatology in children. Integrating support through schools, community organizations, and mental health providers, particularly for vulnerable families with children already evidencing symptomatology prior to the pandemic, is one avenue forward in meeting this need.

And, finally, positive events for children and parents are another avenue for supporting family functioning. These events include spending quality time together, taking care of the physical needs of family members (e.g., diet, sleep, exercise), and engaging in enjoyable activities. These may well be the very activities that are most difficult for families to maintain under the conflicting work and caregiving demands of the pandemic. Finding ways to support families in making time for these activities, without adding to parental stress or a sense of failure for not doing them, is another way to enhance family functioning during this time.

Declarations

Competing interests: The authors declare no competing interests.

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Tables

Table 1

Correlations and Reliability Estimates among Primary Study Variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Child Age	-													
2. SES	-.19	-												
Wave 4 Variables														
3. PR Family Open Comm	-.18	.04	-											
4. CR Family Open Comm	-.15	.20	.13	-										
5. PR Marital Satisfaction	-.08	.13	.15	.13	-									
6. PR P-C Relation Qlty	-.06	-.05	.25	.03	.02	-								
7. CR P-C Relation Qlty	-.07	.02	.01	.32	.02	.43	-							
8. PR Family Satisfaction	-.14	.05	.65	.11	.38	.40	.22	-						
9. CR Family Satisfaction	-.17	.13	.25	.55	.22	.22	.50	.27	-					
10. PR Child Symptoms	-.11	.07	-.23	.01	-.32	-.26	.03	-.29	-.20	-				
11. CR Child Symptoms	-.01	-.26	-.07	-.18	-.15	-.05	-.10	-.08	-.35	.33	-			
Wave 9 Variables														
12. PR Family Open Comm	.07	-.09	.51	-.00	.21	.16	.10	.51	.17	-.25	-.07	-		
13. CR Family Open Comm	-.09	.11	.31	.18	.24	.21	.23	.28	.45	-.26	-.16	.33	-	
14. PR Marital Satisfaction	-.03	.09	.11	.03	.72	-.07	.06	.36	.07	-.23	.02	.27	.19	-
15. PR P-C Relation Qlty	.04	-.05	.31	.03	.23	.60	.22	.37	.18	-.30	-.16	.54	.33	.17
16. CR P-C Relation Qlty	-.13	.18	.24	.21	.28	.36	.45	.29	.38	-.22	-.13	.17	.68	.22
17. PR Family Satisfaction	-.01	.01	.28	.06	.35	.17	.28	.48	.23	-.37	.01	.71	.47	.48
18. CR Family Satisfaction	-.15	.12	.29	.31	.33	.20	.34	.25	.46	-.16	-.18	.28	.77	.25
19. PR Child Symptoms	-.03	-.03	-.22	-.05	-.27	-.33	-.04	-.26	-.18	.64	.30	-.39	-.23	-.16
20. CR Child Symptoms	-.05	-.19	-.19	-.20	-.21	.05	-.12	-.10	-.36	.30	.50	-.23	-.16	.02

21. PR Social Support	.17	.01	-.02	-.02	.45	-.11	-.04	.17	-.01	-.07	-.08	.25	.09	.52
22. PR Parent Functioning	.18	-.16	.01	-.07	-.27	.12	-.00	-.12	-.20	.13	.11	-.03	-.02	-.16
23. PR Negative Stressors	.05	.04	-.06	-.22	-.39	.03	-.12	-.27	-.26	.23	.09	-.18	-.06	-.30
24. CR Negative Stressors	.06	.04	-.05	-.07	-.09	.18	.07	.07	-.06	.00	.20	-.07	-.05	.22
25. PR Positive Events	.04	.03	.11	.14	.10	-.08	.01	.17	.12	.08	.18	.14	.03	.27
26. CR Positive Events	-.07	.32	.22	.13	-.02	-.01	.06	.02	.14	-.10	-.15	.13	.30	-.03
Mean	10.6	.03	3.97	3.95	5.60	4.18	4.09	3.85	4.04	0.41	0.56	4.05	3.77	5.71
Variance	1.35	.53	.23	.31	.80	.25	.33	.24	.33	.06	.07	.31	.35	1.35
Reliability Estimate	—	—	.84	.84	.90	.85	.82	.86	.85	.89	.86	.89	.84	.94

Note: PR= Parent Report; CR= Child Report; P-C=Parent-Child; Comm=Communication; Qty=Quality. Dashed lines indicate reliability estimate not included because internal reliability is not appropriate to life events indices.

Table 2. Changes in Parent- and Child-Report of Family Functioning

Outcome	Sample Size	Mean W4	Mean W9	T-Test
Child-Reported Variables				
Open Family Communication	89	3.94	3.77	2.12*
Parent-Child Relationship Quality	89	4.09	3.80	3.72***
Family Satisfaction	89	4.04	3.84	2.84**
Parent-Reported Variables				
Open Family Communication	89	3.97	4.05	-0.92
Parent-Child Relationship Quality	89	4.18	4.12	1.82+
Family Satisfaction	89	3.84	3.93	-0.56
Marital Satisfaction	76	5.60	5.71	-0.93

Note: ***, **, *, and + indicate p<.001, p<.01, P<.05, and p<.10 respectively. W4=wave 4; W9=wave 9.

Figures

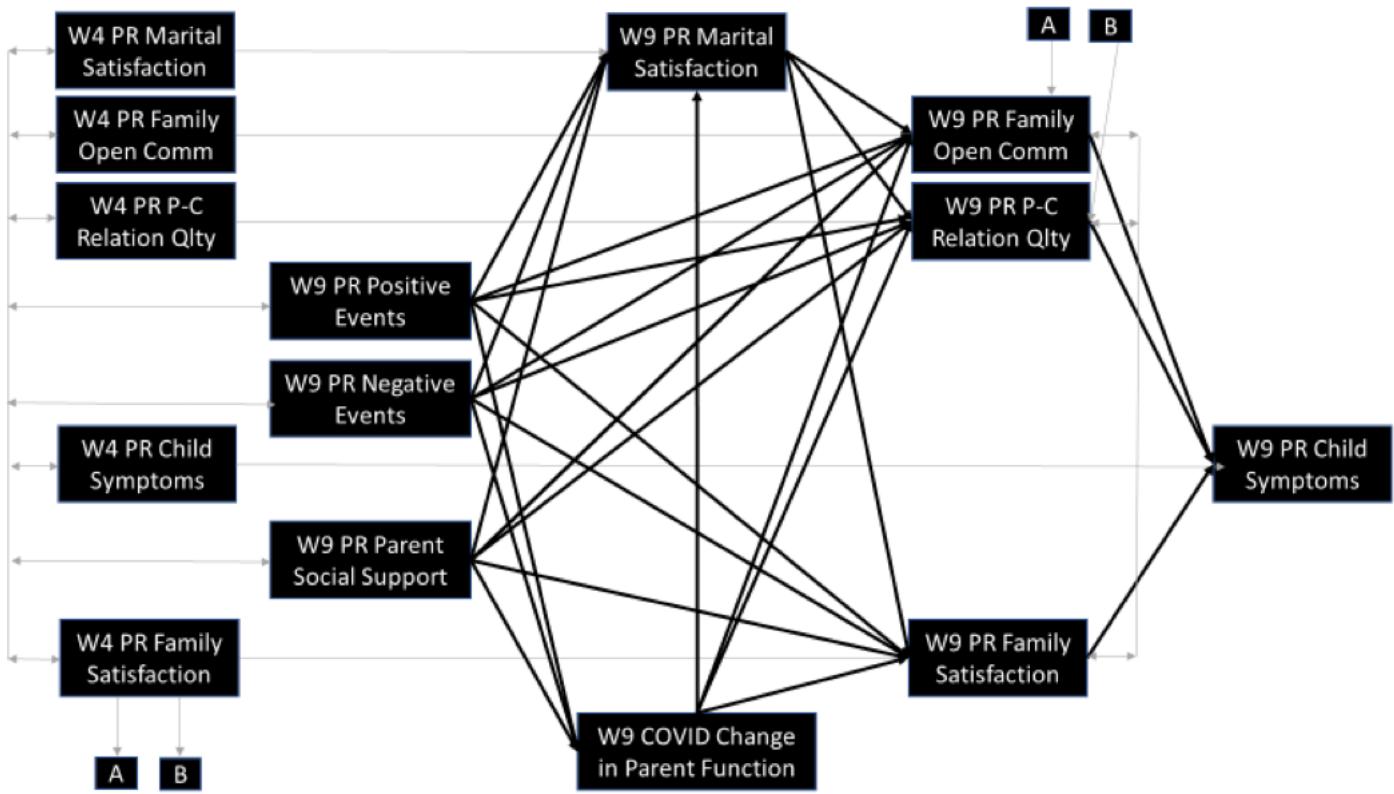


Figure 1

Estimated Parent-Report Full Hypothesized Model. Note: PR= Parent Report; Comm=Communication; Qlty=Quality. W4=Wave 4; W9=Wave 9. Prediction of family open communication and parent-child relationship quality from family satisfaction indicated by boxed A and B pathways, respectively. Gray lines are control pathways. Dark lines are significant at $p<.05$ and dashed lines at $p<.10$.

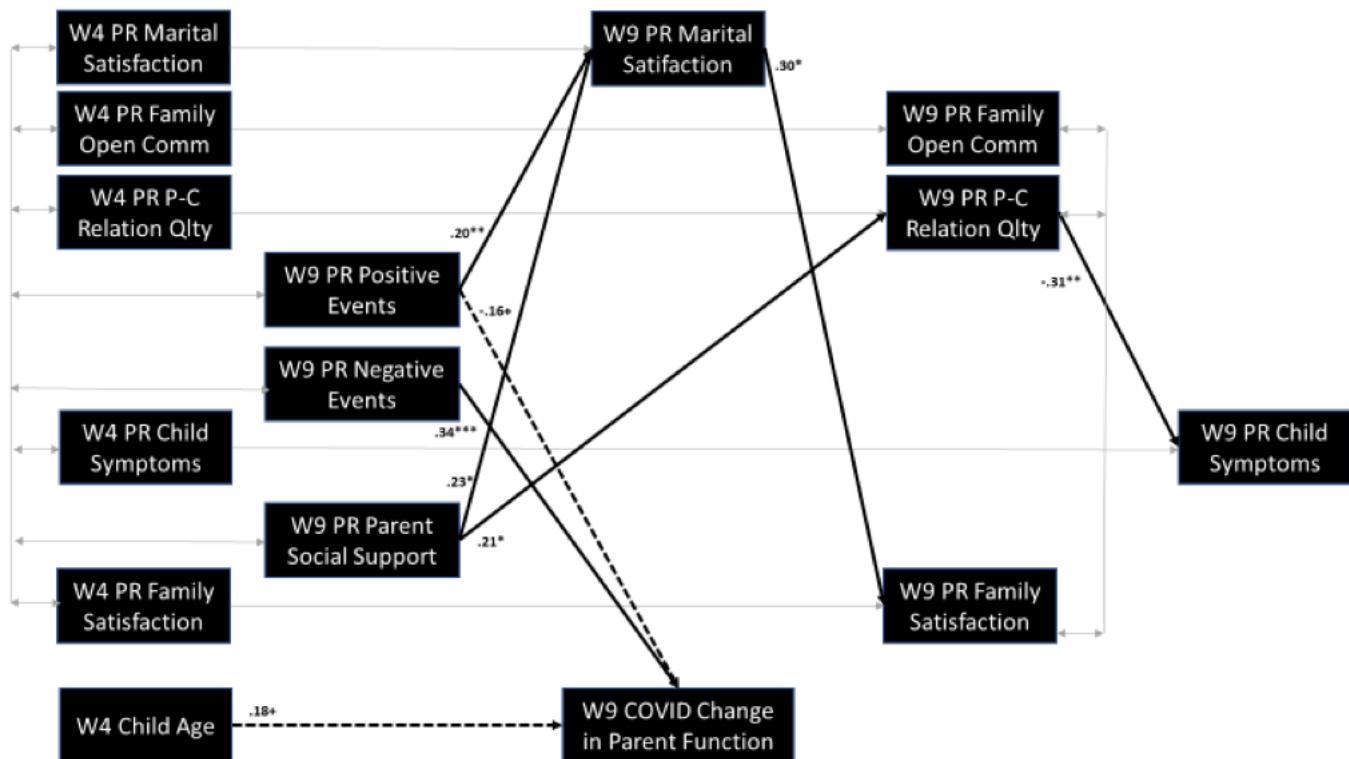


Figure 2

Results of Parent-Report Full Hypothesized Model. Note: PR= Parent Report; Comm=Communication; Qlty=Quality. W4=Wave 4; W9=Wave 9. Prediction of family open communication and parent-child relationship quality from family satisfaction indicated by boxed A and B pathways, respectively. Gray lines are control pathways. Dark lines are significant at $p < .05$ and dashed lines at $p < .10$.

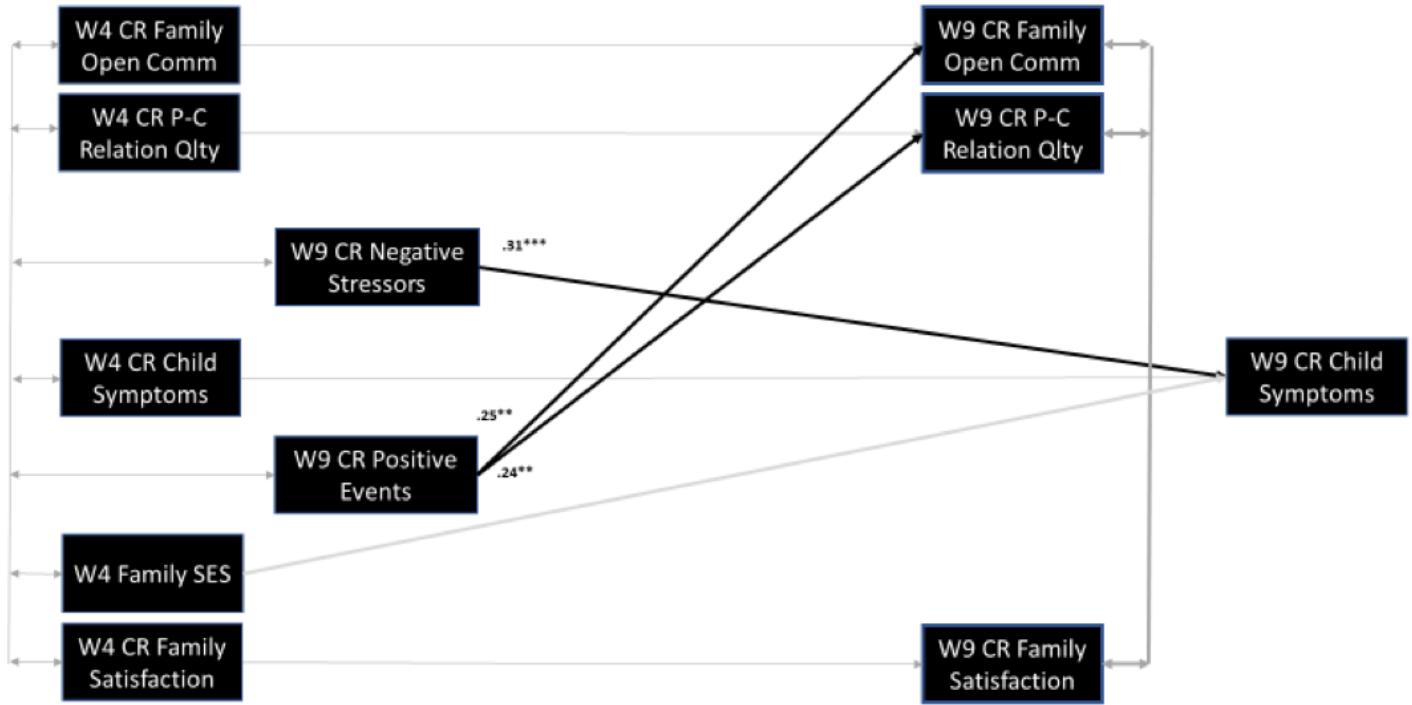


Figure 3

Results of Child-Report Full Hypothesized Model. Note: CR= Parent Report; Comm=Communication; Qlty=Quality; SES=Socio-economic status. W4=Wave 4; W9=Wave 9. Prediction of family open communication and parent-child relationship quality from family satisfaction indicated by boxed A and B pathways, respectively. Gray lines are control pathways. Dark lines are significant at $p < .05$ and dashed lines at $p < .10$.

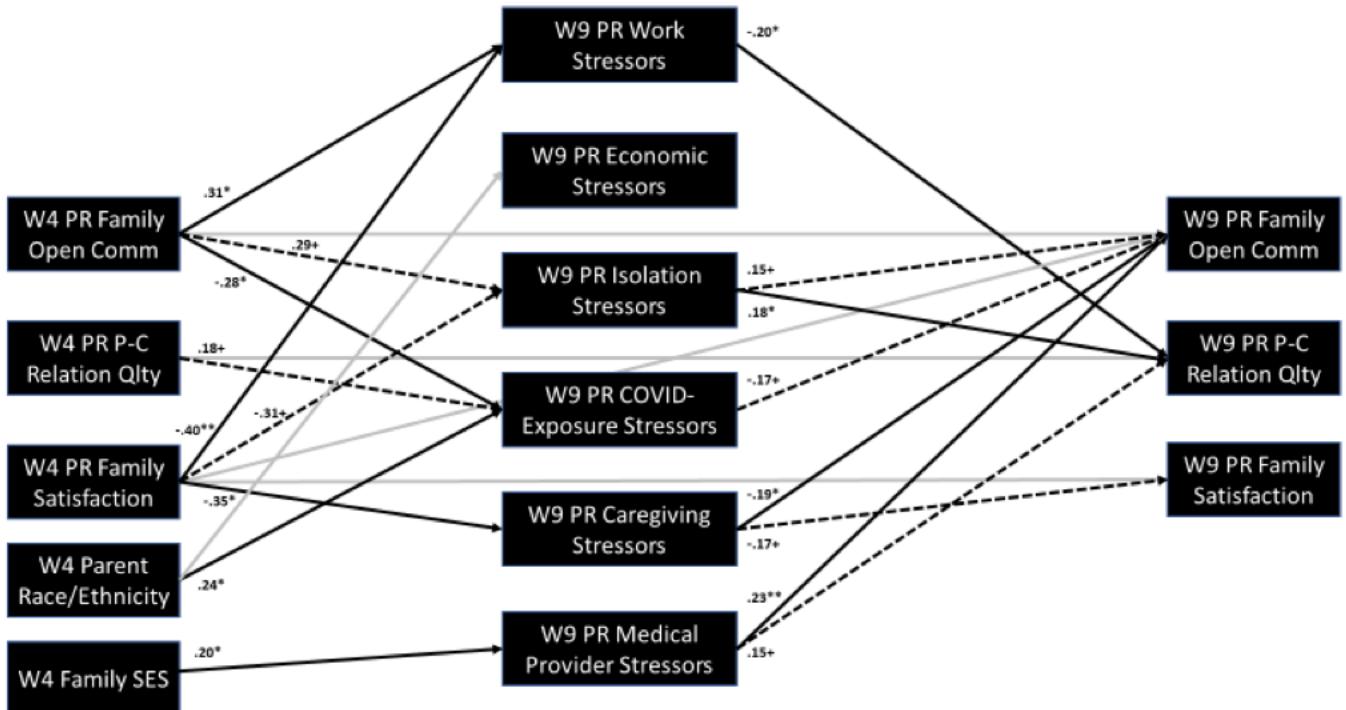


Figure 4

Results of Specific COVID-19 Stressors on Parent-Report of Family Functioning Over Time. Note: PR= Parent Report; Comm=Communication; Qlty=Quality; SES=Socio-economic status. W4=Wave 4; W9=Wave 9. Direct paths from wave 4 to wave 9 family functioning variables depicted by grayed lines (results not reported here). Gray lines are control pathways. Dark lines are significant at $p<.05$ and dashed lines at $p<.10$.

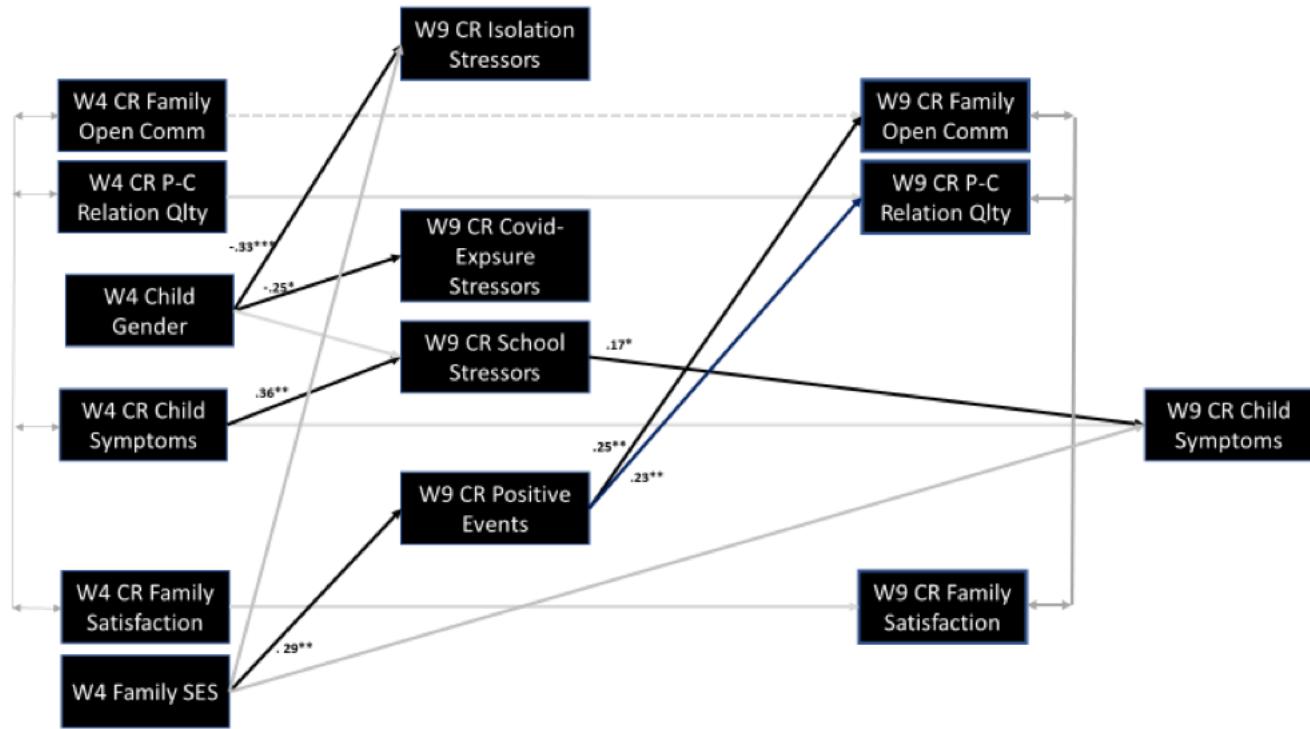


Figure 5

Results of Specific COVID-19 Stressors on Child-Report of Family Functioning Over Time. Note: CR= Parent Report; Comm=Communication; Qlty=Quality. W4=Wave 4; W9=Wave 9. Direct paths from wave 4 to wave 9 family functioning variables depicted by grayed lines (results not reported here). Gray lines are control pathways. Dark lines are significant at $p<.05$ and dashed lines at $p<.10$.