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Permalink

<https://escholarship.org/uc/item/39d049sp>

Journal

Research on Child and Adolescent Psychopathology, 48(11)

ISSN

2730-7166

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Publication Date

2020-11-01

DOI

10.1007/s10802-020-00688-7

Peer reviewed



Published in final edited form as:

J Abnorm Child Psychol. 2020 November ; 48(11): 1511–1524. doi:10.1007/s10802-020-00688-7.

Why Family Communication Matters: The Role of Co-Rumination and Topic Avoidance in Understanding Post-Disaster Mental Health

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Abstract

Although families can be a source of support post-disaster, depending on how they communicate about their stress, their attempts at support can be helpful or harmful. This study explored the moderating role of topic avoidance and co-rumination on post-disaster mental health (MH) in a sample of 485 parent-child dyads following severe floods affecting Texas. Parents (69.0% female) and their oldest child between the ages of 10–19 years ($M = 13.75$ years, $SD = 2.56$) completed online surveys approximately one-year post-flooding. Participants reported their flood exposure, life stressors since the disaster, topic avoidance, co-rumination, and MH symptoms (posttraumatic stress symptoms [PTSS], depression, anxiety). Structural equation models tested a moderated-mediation model of whether communication processes moderated the associations of flood exposure and life stressors on MH. They did not moderate the association of flood exposure to PTSS, but did have a moderating role for depression and anxiety. At low levels of topic avoidance, there was no association between flood exposure and child anxiety or depression. However, at mean and high levels of topic avoidance, there was a significant, positive association between flood exposure and child anxiety and depression. Co-rumination impacted both parents and children. For parents, there was no association between flood exposure and depression or anxiety when co-rumination was low or mean-level. However, flood exposure increased risk for depression and anxiety at high levels of co-rumination. A similar pattern emerged for children. Results for life stressors were nuanced. Overall, this suggests that communication can influence post-disaster MH.

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Conflicts of Interest: The authors declare they have no conflicts of interest.

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Keywords

Natural disaster; communication; posttraumatic stress; anxiety; depression; co-rumination

Natural disasters can increase the risk for mental health (MH) problems for children, adolescents, and adults through direct disaster exposure, as well as the impact the disaster has on increasing risk for subsequent life stressors, such as financial problems, moving neighborhoods, and more (Bonanno et al., 2010). Meta-analytic research supported that natural disasters increased risk for posttraumatic stress symptoms (PTSS), as well as other internalizing (e.g., anxiety, depression) and externalizing (e.g., aggression, defiance) symptoms in children and adolescents (Furr et al., 2010; Rubens et al., 2018). MH problems can reach the full symptom criteria for a diagnosis and persist for years post-disaster among children aged 4–17 years (Felix et al., 2011). However, MH outcomes post-disaster depended upon a complex combination of risk and protective factors at individual, family, and community levels (Bonanno et al., 2010). Within families, greater parental distress post-disaster was related to greater symptoms in children (see Bonanno et al., 2010). Parent-child relationship quality and parents' partner relationship quality also influenced child post-disaster MH among children age 4–17 years (Felix et al., 2013). Social support plays an important role in MH following traumatic events (Kaniasty & Norris, 2004), and how this support is transmitted through communication practices warrants further investigation.

Although parents can be a major source of support post-disaster, depending how they communicate about their stress, their attempts at support may be helpful or harmful. For instance, it is often still assumed that simply talking about one's stress or trauma improves MH (e.g., Harvey et al., 2019; Kohler et al., 2018), although a meta-analysis of critical incident stress debriefing showed no beneficial impact compared to no intervention (van Emmerik et al., 2002). Likewise, in public service announcements it is suggested that if parents simply talk to their children about a natural disaster, it will alleviate their children's distress (W. Afifi et al., 2016). However, parents need to know how to talk with their children about natural disasters and simultaneously regulate the disclosure of their stress effectively. In particular, research shows that when people co-ruminate, in that they cannot stop talking about their negative emotions and potential consequences of their stressor with each other, it can perpetuate anxiety and depressive symptoms in adolescents aged 13–16 years (Rose et al., 2017; Schwartz-Mette & Smith, 2018). At the same time, avoidance and secret keeping can contribute to anxiety and distress in young adults aged 18–22 years (Lane & Wegner, 1995).

Refraining from talking about an issue is not merely the opposite of co-rumination, and research that can differentiate their effects on MH is necessary. Topic avoidance and co-rumination were qualitatively different, tended to be used for different reasons, and related to different relationship outcomes (Afifi et al., 2017). For example, a mother avoiding talking about her financial stress with her adolescent daughter can have different outcomes than the mother continually disclosing her anxieties about the financial stress with her daughter. Researchers, however, often assumed they were opposite ends of a communication continuum and rarely compared their unique contributions to MH in the same study.

Consequently, the aim of the current study was to test the moderating effects of parents' and adolescents' co-rumination and topic avoidance on MH outcomes following a natural disaster. Specifically, we argue that co-rumination and topic avoidance interact with disaster exposure and life stressors to moderate the impact of flood exposure on parents' and adolescents' anxiety, depressive, and PTSS.

Family Communication in the Post-Disaster Context

Despite the role of communication in understanding how families support one another following a stressful event, the disaster research field has only recently begun systematic investigation of how family members communicate with one another post-disaster. Among adults, there was a correlation between PTSS and more frequent talking about the disaster experience, but the direction of the association is unknown (Houston & Franken, 2015). Qualitative research with adults following a slow-moving environmental disaster revealed several potential typologies of family communication, including Open/Supportive, Silent/Supportive, Open/Conflictual, Silent/Conflictual, and Silent/Denial (Orom et al., 2012). Silent/supportive described when the person was being silent as a method to support others, such as not burdening their family. Silent/conflictual consisted of a person avoiding a topic in order to avoid an argument. Silent/denial was when the person resisted communicating about the disease that resulted from the technological disaster. Orom et al. (2012) found that the silent subtypes, even if the underlying intention was to be supportive, was related to greater distress among family members. The limited research available on topic avoidance and natural disasters suggests that even if it was intended to help or prevent negative effects from occurring, tended to negatively influence MH.

To date, we are only aware of a handful of studies exploring communication among parents and their children post-disaster. Following the Boston Marathon Bombing, Carpenter et al. (2017) surveyed parents only of youth age 4–19 years about their different communication strategies in the days surrounding the bombing and manhunt, and then assessed its role in parents' reports of children's MH. They found it was helpful to have caregivers inform the child of the attack, express confidence in their child's safety, and discuss their own feelings, but unhelpful for caregivers to avoid discussions of the event and express concerns about safety. A more recent, mixed-methods examination of communication demonstrates its role in understanding lingering distress post-disaster. Hendrickson et al. (2019) had parents and children age 12–17 years engage in a co-remembering task about their experiences during a deadly tornado. They found that a parent communication style where the caregiver focused the conversation on their own emotions, perceptions, and experiences, at the expense of their child's ability to share, was significantly related to PTSS assessed years post- disaster.

Research on Verbal Rumination and Topic Avoidance

The broader literature on verbal rumination and topic avoidance provides important insights into how these communication processes might affect the MH of parents and adolescents following a natural disaster. Research showed that disclosing one's trauma through writing or talking was associated with reduced anxiety and stress (Harvey et al., 2019; Kohler et al., 2018), and better emotion regulation (Pagani et al., 2019). Even though there was evidence

that disclosing one's stress or trauma is beneficial, the effects of disclosure on MH typically depend on the nature of the disclosure and the response from others to the disclosure (Izaguirre & Cater, 2018). Most research on the benefits of disclosure has been conducted with writing experiments or in confidential contexts (e.g., disclosing to a counselor), but not the disclosure of one's stress to family and friends who might have varying responses to the disclosure (Kelly & Macready, 2009). Yet, most natural disasters and other life stressors are managed in the context of close relationships, where the stressor might be shared and discussed repeatedly. Positive modeling can prevent the learning of fear in children (Askew et al., 2016), but if parents show excessive fear, this may be harmful. Overall, research shows that the impact of disclosure on MH depends upon responses to the disclosure. If the reaction is negative or rejecting, it can make the discloser's stress and MH worse (e.g., Izaguirre & Cater, 2018).

Across disciplines, research showed that verbal rumination and co-rumination are associated with anxiety and depressive symptoms among adolescents and young adults (e.g., Smith & Rose, 2011; Stone et al., 2010). Whereas verbal rumination involves one person talking repeatedly about his or her depressive thoughts to another person, co-rumination involves both people continuously talking about their problems and negative emotions together. The majority of the work on co-rumination demonstrated that it increased anxiety and depressive symptoms among adolescent girls ages 10–15 years, but simultaneously brought them closer emotionally because of the bonding that transpired through the talk (Rose, 2002; Rose et al., 2017). Some research found the same effects for boys (Rose, 2002; Schwartz-Mette & Smith, 2018). Research on clinical depression, for example, illustrated that if people continuously cognitively and verbally ruminated about their negative emotions, it generated additional stress for themselves and others (Ames-Sikora et al., 2017).

The effects of topic avoidance on MH are more nuanced than that of co-rumination. In general, research on both avoidant coping and topic avoidance suggested that they were associated with depressive and anxiety symptoms, particularly if avoidance became a dominant form of coping with traumatic events (e.g., Donovan-Kicken & Caughlin, 2011; Flanagan et al., 2014). Family members and emerging adult dating partners also did not like it if they believed their family member/partner was avoiding a topic with them, even if avoidance was not actually occurring; but if they believed their family member was avoiding the topic to protect the relationship, the avoidance was no longer associated with dissatisfaction (Caughlin & Golish, 2002). People often refrain from talking about sensitive topics to not only protect their relationships, but to protect themselves and other people. Topic avoidance might be used to prevent conflict, to maintain relationships, and to regulate the emotions of the entire family (Roloff & Ifert, 2000). It also provided hope and optimism when families faced stressful situations like illness diagnoses (e.g., Caughlin et al., 2011). Family members might avoid talking about a stressor if problem solving was futile and talking about it created more stress. Consequently, topic avoidance might be harmful to MH if it prevents family members from effectively addressing their stress, but it can also serve important protective functions.

Current Study

Research and conceptual models show (e.g., La Greca et al., 1996) that when a natural disaster occurs, if the family members experience a cascade of stressors, it can magnify the effects of the natural disaster on their MH. Thus, life stressors since the disaster can mediate the relationship of disaster exposure to MH, and hence is included in our model as an aspect of the post-disaster experience. The current study focuses on floods that occurred in 2015–2016 in Texas. Extant research suggested that parents' and adolescents' co-rumination about their stress should make the impact of the flood exposure and subsequent life stressors on their symptoms of depressive, anxiety, and PTSS worse. Talking continuously about the negative emotions and consequences of the flood and life stressors likely makes the negative effects on MH especially pronounced. A similar moderating pattern is likely to occur for topic avoidance, but it might not be as harmful to MH as co-rumination. Therefore, we test the moderated-mediation model presented in Figure 1 to address the following hypotheses:

Hypothesis 1.

Topic avoidance will moderate the relationship of disaster exposure and life stressors since the disaster on parent and child MH. Greater topic avoidance will increase risk for MH symptoms.

Hypothesis 2.

Co-rumination will moderate the relationship of disaster exposure and life stressors since the disaster on parent and child MH. Greater co-rumination will increase risk for MH symptoms.

Method

Procedure

The Federal Emergency Management Association (FEMA) made six major disaster declarations for Texas between May 2015 and May 2016, the period of this study, with 159 out of 254 counties receiving FEMA declarations for individual and/or public assistance. Initially, the current research began as a study following the Memorial Day Weekend flood of 2015 that affected 44.5% (113) counties in Texas. After receiving Institutional Review Board (IRB) approval from the University of California, Santa Barbara, recruitment began in October 2015. Very shortly after recruitment began, another devastating flood occurred (Halloween Weekend Flood 2015). IRB was modified to ask about both floods (only one person participated before this modification). Over the course of recruitment, additional flooding and storms occurred, including the April 2016 flood that affected Houston and surrounding areas. This made it prohibitive, in terms of participant time and survey fatigue, to ask exposure questions repeatedly for each flood, as families could have been affected by multiple floods. Therefore, IRB was modified to ask about the “flood most stressful to you” and participants could indicate “Memorial Day Weekend 2015,” “Halloween Weekend 2015,” “April 2016,” or “Other” and specify which flood.

Recruitment included distributing flyers at local schools, community events, and shopping centers; advertising in electronic newsletters from local education institutions; posting flyers in libraries and community centers; door-to-door recruitment in affected neighborhoods; advertising in social media forums, newspapers, and online ads; and telephone recruitment. To reach the desired dyadic sample size, we also used an opt-in panel obtained through Qualtrics, following the April 2016 flood and severe weather. Parents provided consent for themselves and their eligible child, and youth also provided assent. Recruitment ended March 2017. Average time since disaster at survey completion was 406.33 days ($SD = 162.79$). All participants completed their surveys online and received a small incentive for participation.

Participants

A sample of 581 parents and 510 children aged 10–19 years old were recruited from flood-affected areas in Texas. Given that the current study is dyadic, we excluded parents for whom their child did not participate or had incomplete data. We also excluded 26 parents and 24 children who reported their most stressful flood experience was “other” because of the wide range of past floods reported (e.g., a 2010 flood, Hurricane Katrina, none were stressful, etc.). The final sample included 485 parent-child dyads. Parent participants were predominantly female (69.0%), and the primary relationship to the child was mother (66.3%), father (26.0%), or other family relationship (7.6%; e.g., stepparent, grandparent). Parents’ ethnicity was 62.2% White, 18.2% Latinx, 9.2% African American, 7.7% Asian or Pacific Islander, 1.5% Native American, and 1.3% Mixed. United States Census data for Texas adjusted for 2016 showed the population to be 42.6% White (not Hispanic), 39.1% Latinx, 12.6% African American, 4.8% Asian, 0.1% Pacific Islander, and 1.0% Native American. The modal parent education was graduated college or graduate school (46.9%). Median household income was \$60,001–\$70,000. Parents were asked to have their oldest child within the eligible age range of 10–19 years old complete the child survey, as we needed one focal child old enough to reliably complete an online survey. Mean child age was 13.75 years ($SD = 2.56$). Child participants were 52.8% male, and ethnicity was 57.3% White, 18.6% Latinx, 9.0% African American, 7.7% Asian/Pacific Islander, 1.0% Native American, and 6.1% biracial/multiethnic. Most parents (68.6%) described their family as continuously intact (traditional nuclear family). Almost half (45.4%) of parents and approximately one quarter (26.6%) of children included in the study fell into the clinical range on the Hopkins Symptom Checklist (HSCL-25; Derogatis et al., 1974).

Measures

Flood Impact Questionnaire (FIQ).—The FIQ was developed by the authors from established measures of disaster exposure (Felix et al., 2011; Ginexi et al., 2000; La Greca et al., 1996). Parents and their child completed separate FIQs with regard to the flood most stressful to them. Response options were 0 = *no*, 1 = *yes*. One item on damage to participants’ home was answered on a 5-point scale from 0 (*No Damage*) to 4 (*Total Loss or Destruction*). This was converted to a dichotomous scale (0 = *No Damage*, 1 = *Any Damage*) following an analysis demonstrating that it was no versus any damage that distinguished between MH outcomes. We combined child and parent flood exposure into one total flood exposure sum score, based on the procedures used in past disaster studies

focusing on dyads (Felix et al., 2011). For items that were asked of both parents and children, if either one reported “yes,” then they received a score of 1. For items asked of parents only or children only, either one reporting a yes, contributed a 1 to the sum score. The total sum score represents the total flood exposure items the family experienced. The predictive validity of this measure has been demonstrated through the relationship of increasing levels of exposure to greater levels of PTSS, anxiety, and depression symptoms for both parents and youth (Felix et al., 2019).

Inventory of Life Stressors (ILS).—Study participants were also asked if they had experienced different stressful life events (life stressors) in the months since the flood that was most stressful to them. Items (12) for the parents were adapted from questions used in prior research following wildfire disasters (e.g., Freedy et al., n.d.; Felix et al., 2015) and asked about job changes, moving away, illness or injury to self or a family member, money problems, relationship problems, problems dealing with insurance companies, and difficulties with rebuilding or fixing a home. For the child, items (9) were similar but asked about school instead of work. Response options were 0 = *no*, 1 = *yes*. Total scores were computed by the sum of the dichotomized items. We combined the parent and child life stressors reported, following the same procedures as for flood exposure, to create a total family life stressors score. Predictive validity is supported through the negative relations of life stressors since the disaster to various aspects of social-emotional health among the children (Felix et al., 2020).

PTSS.—Parents completed the Impact of Events Scale (IES-6; Thoresen et al., 2010), and children completed the Children’s Revised Impact of Events Scale-8 (CRIES-8; Yule, 1997). Participants were asked to indicate, with respect to the flood that was most stressful to them, how much they were distressed or bothered during the past seven days by each difficulty listed. Response options were 0 (*not at all*) to 4 (*extremely*), with a total score representing the sum of responses. The IES-6 is a 6-item measure of PTSS derived from the IES-Revised (Weiss & Marmar, 1997). It contains two items each assessing intrusion (e.g., “Other things kept making me think about it”), avoidance (“I tried not to think about it”), and hyperarousal (“I had trouble concentrating”). The IES-6 correlated highly (pooled correlation = 0.95) with the IES-R in four different samples of individuals exposed to a traumatic event, across gender, age, type of trauma, and trauma severity, and has good internal consistency ($\alpha = .80$; Thoresen et al., 2010). The CRIES-8 is used with children aged 8 years and older and measures intrusion and avoidance. The criterion validity of the CRIES-8 in comparison to a diagnostic interview in two samples of children, showing a 75–83% correct classification rate (Perrin et al., 2005). Among child survivors of a natural disaster, data for the CRIES-13 support its convergent validity ($r=.79$) and stable factor structure (Giannopoulou, 2006). Our data yielded reliability estimates of $\alpha = .95$ for both the parent and child scales.

Depression and anxiety.—The Hopkins Symptom Checklist (HSCL-25; Derogatis et al., 1974) measures symptoms of anxiety (10 items; e.g., “suddenly scared for no reason”, “feeling fearful”) and depression (15 items; e.g., “feeling low in energy, slowed down”, “crying easily”). Parents and children reported how much each symptom bothered them in the last week. Responses ranged from 1 (*not at all*) to 4 (*extremely*) and were averaged to

create an anxiety and a depression score, per scoring guidelines. Due to IRB recommendations, one depression item (“thoughts of ending your life”) was not included in the child version of the checklist used in this study. The HSCL shows good internal consistency across subscales (α 's range .85–.87). Test-retest reliability was strong ($r=.81$ Dep, $r=.75$ Anx), and inter-rater reliability was sufficient ($r=.64$ Dep, $r=.67$ Anx) (Derogatis et al. 1974). In comparing HSCL-25 scores to diagnoses obtained from a psychiatric interview, the HSCL-25 showed good sensitivity (76%) and specificity (73%) (Nettelbladt et al., 1993). In our study, internal consistency was excellent (Anx $\alpha = .93$, Dep $\alpha = .95$ for parents; Anx $\alpha = .96$, Dep $\alpha = .97$ for children).

Co-Rumination.—Parents' and adolescents' co-rumination was measured using five items derived from the 27-item Co-Rumination Questionnaire (CRQ; Rose, 2002). For the purposes of the current study, items were worded to reflect on participants' perceptions of their own verbal rumination when discussing problems related to the flood with their parent/child. In particular, items assessed how much parents and children discussed the same problem repeatedly, speculated about the consequences of the problem, and focused on negative feelings. A sample item is “When we talk about a problem that one of us has related to the flood, we'll talk about every part of the problem over and over.” Responses ranged from 1 (*not at all true*) to 5 (*really true*). An exploratory factor analysis of the original CRQ showed one factor with loadings $<.45$, and greater co-rumination was associated with anxiety and depression symptoms (Rose, 2002). It also had excellent internal consistency ($\alpha = .96$; Rose, 2002). Reliability of the five items used in the current study was very good ($\alpha = .88$ for parents, $\alpha = .90$ for child). As parents reported how they spoke with the focal child, and the child reported how they spoke with the focal parent, we created a mean family-level score, about how much the dyad reported co-rumination.

Topic Avoidance.—Participants reported the extent to which they avoided talking about the flood with their parent/child on three items adapted from prior research on topic avoidance (Afifi et al., 2008). A confirmatory factor analysis with the original scale showed strong loadings (.71–.95) and fit indices ($\chi^2=68.82$, $p=.06$, CFI=.96, NFI=.95, RMSEA=.07), with internal consistency ranging from .82–.90. A sample item is “I purposefully refrained from discussing my feelings about the flood with my parent(s).” Items were answered on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). A mean score was computed, with higher scores indicating greater avoidance. Our data yielded reliability estimates of $\alpha = .92$ for parents and $\alpha = .96$ for child. As parents reported how they spoke with the focal child, and the child reported how they spoke with the focal parent, we created a mean family-level score, about how much the dyad reported avoiding communication about the disaster.

Analytic Procedure

Correlations, histograms, and descriptive statistics for study variables, child age, child sex, and time since disaster are provided in online supplemental materials. For most variables, there was no influence of child sex, child age, or time since disaster, and it was only weakly related for some. As such, we did not include them in our subsequent modeling. Structural equation modeling (SEM) was used for its ability to estimate complex variable relations

simultaneously. All models were estimated using Mplus Version 8 (Muthén, & Muthén, 1998–2017). The model estimated (see Figure 1) involves moderated-mediation, where life stressors mediated the relationship of flood exposure to MH outcomes for parents and children. The communication variables were moderators of both flood exposure and life stressors on MH. A total of six models were estimated, varying by the communication moderator and by the MH outcome (fit indices provided in the online supplemental materials). Generalized linear modeling was used to model different paths, based on the type of data the variable represented. The path from flood exposure to life stressors was modeled with Poisson regression as life stressors is reported as count with the mass of the distribution near zero. Consequently, the $x \rightarrow m$ coefficient is in the logistic scale. The Poisson model assuming equal mean and variances was compared to inflated Poisson and two-part Poisson models. The non-inflated Poisson model was found to be the best fit for the life stressor mediator variable. The communication moderator variables were continuous so standard levels were chosen to represent their distribution.

Due to the non-normality of the mediator and outcome variable distributions, estimation of unbiased mediation effects posed analytic challenges. Wang and Zhang (2011) found that non-normality of any of the three variables that constitute a mediation effect lead to biased estimates. As the focus of this paper is the moderating role of the communication variables, the indirect effects are not reported; however, the regression paths that comprise mediation are discussed (i.e. α , β , C'). For all other paths, left censored-normal regression was chosen to model the three outcomes due to the skewed continuous characteristic of these variables and for clarity of interpretation. The censored-normal models were compared to a censored inflated model, which models the outcome as mixture of a binary and a continuous component, as well as a two-part censored model. The censored-normal model was found to better fit to the data for all six models based on the Bayesian Information Criterion (BIC).

Results

The conceptual model being tested is displayed in Figure 1. The path values and significance for each outcome are in Table 1 for topic avoidance and Table 2 for co-rumination. If moderation was found, graphs of simple slopes are displayed in Figure 2–4, respectively.

The Influence of Topic Avoidance on Post-Disaster Mental Health

Anxiety.—Flood exposure had a direct effect on life stressors and on child anxiety, and life stressors partially mediated the relationship between flood exposure and child anxiety. Flood exposure did not have a significant effect on parent anxiety, rather life stressors mediated the relationship between flood exposure and parent anxiety. Topic avoidance moderated the relationship between flood exposure and reported child anxiety, but not for parents. An examination of simple slopes revealed that at low levels of topic avoidance (i.e., $-1 SD$), the slope did not significantly differ from zero, indicating there was no relationship between flood exposure and child anxiety. At mean and high (i.e., $+1 SD$) levels of topic avoidance, there was a significant, positive relationship found between flood exposure and child anxiety, with the steepness of the slope increasing at high levels of topic avoidance.

Topic avoidance was found to significantly moderate the relationship between life stressors and child anxiety, but again not for parent anxiety. At low and mean levels of topic avoidance, a significant positive relationship was found between life stressors and child anxiety. When topic avoidance was high, the slope did not significantly differ from zero. Thus, at high levels of topic avoidance, no relationship was found between life stressors and child anxiety.

Depression.—Flood exposure had a direct effect on child depression, but not on parent depression. Life stressors mediated the relationship between flood exposure and parent depression and mediated the relationship between flood exposure and child depression. Topic avoidance significantly moderated the influence of flood exposure on child depression, but not for parents. Simple slopes revealed no significant relationship between flood exposure and child depression when topic avoidance was low. When topic avoidance was at the mean or high levels a significant positive relationship emerged, with a steeper slope at high levels of topic avoidance. The mediation path between life stressors and child depression was significantly moderated by topic avoidance, but not for parent depression. Simple slopes showed a significant, positive relationship between life stressors and child depressive symptoms when topic avoidance was either low or at the mean. No significant relationship was found between life stressors and child depressive symptoms when topic avoidance was high.

PTSS.—Similar results were found across parents and children. For both, flood exposure had a direct effect on PTSS. Flood exposure also influenced life stressors; however, life stressors did not influence PTSS. Topic avoidance did not have a moderating effect on either the relationship of flood exposure to PTSS or the relation of life stressors to PTSS.

Conclusion.—Overall, topic avoidance functioned differently with PTSS than for anxiety and depression. Topic avoidance consistently moderated the relationship between flood exposure or life stressors on anxiety and depression for children, but not parents. For PTSS, flood exposure had a direct relationship to PTSS and topic avoidance did not moderate.

The Influence of Co-Rumination on Post-Disaster Mental Health

Anxiety.—For both parents and children, flood exposure had a direct effect on anxiety, and life stressors mediated the relationship between flood exposure and anxiety. Co-rumination significantly moderated the effects of flood exposure on anxiety. For parents, simple slopes graphs revealed that at low and mean levels of co-rumination, the slope did not significantly differ from zero; indicating no relationship between flood exposure and parent anxiety. At high levels of co-rumination, a significant positive relationship was found between flood exposure and parent anxiety. Co-rumination did not moderate the relation between life stressors and anxiety for parents.

For children, at low levels of co-rumination the slope did not significantly differ from zero, indicating no relationship was found between flood exposure and child anxiety. At mean and high levels of co-rumination, there was a significant, positive relationship between family flood exposure and child anxiety. Co-rumination significantly moderated the mediation

between life stressors and child anxiety. At low and mean levels of co-rumination, a significant positive relationship was found between life stressors and child anxiety. At high co-rumination, there was no relationship between life stressors and child anxiety.

Depression.—Flood exposure had a direct effect on both parent and child depression. The relationship of flood exposure to life stressors was significant and life stressors mediated the relationship between flood exposure and parent and child depression. For both parents and children, co-rumination significantly moderated the relation between flood exposure and depressive symptoms. Simple slopes showed that no significant relationship existed between flood exposure and parent depressive symptoms when co-rumination was either low or at the mean. A significant, positive relationship between flood exposure and parent depressive symptoms emerged when co-rumination was high. For children, there was no significant relationship between flood exposure and child depressive symptoms when co-rumination was low or at the mean; however, a significant, positive relationship emerged when co-rumination was high. For parents, co-rumination did not moderate the relation between life stressors and depression. However, it did for children. Simple slopes revealed a significant, positive relationship between life stressors and child depressive symptoms when co-rumination was either at the mean or low, but no relationship when co-rumination was high.

PTSS.—Flood exposure had a significant, direct effect on both parent and child PTSS. Life stressors mediated the relationship between flood exposure and parent and child PTSS. Results did not support co-rumination as a moderator for either parents or children.

Conclusion.—In sum, with co-rumination as the moderator, flood exposure had a direct effect on life stressors and MH for parents and children. Life stressors also had a direct effect on outcomes for parents and children. Co-rumination did not moderate the relation between flood exposure or life stressors and PTSS for either parents or children. Whereas, co-rumination did moderate the relation between flood exposure and depression/anxiety for both parents and children, and between life stressors and depression/anxiety for children, but not parents.

Discussion

In 2018 alone, 315 natural disasters were documented around the world, affecting over 68 million people, killing over 11,000 people, and leading to over \$100 billion in economic losses (Center for Research on the Epidemiology of Disaster, 2019). The relation of disaster exposure to increased risk for MH symptoms is well-documented (Bonanno et al., 2010; Rubens et al., 2018). Theory and research supported that the recovery context is critical in understanding risk for MH problems post-disaster (Bonanno et al. 2010; La Greca et al. 1996), of which family plays a central role, especially for children. When examining the post-disaster family environment, a review of the research indicated that parental distress was one of the best indicators of child distress post-disaster (Bonanno et al. 2010). However, the reasons behind this relationship have yet to be explored. In fact, most of the family-focused post-disaster research has focused only on a few variables, such as parental distress, parent-child relationship quality, or aspects of parenting. This study extends this body of work by exploring how families communicate. More specifically, we examined the role of

topic avoidance and co-rumination on the association between flood exposure, and life stressors since the disaster, on MH for both parents and children. We found that communication practices affected the relation of flood exposure and life stressors to depression and anxiety symptoms, but did not moderate their relation to PTSS. Flood exposure was associated with parent and child PTSS regardless of the level of topic avoidance or co-rumination, and life stressors mediated this association.

Topic Avoidance Moderated Post-Disaster Depression and Anxiety for Children

Topic avoidance played an important role with post-disaster anxiety and depression for children, but not for parents. At low levels of topic avoidance, there was no association between flood exposure and child anxiety or depression. However, at mean and high levels of topic avoidance, there was a significant, positive association between flood exposure and child anxiety and depression. Based on these results, avoiding discussions may be harmful in some instances. Prior research indicated it may be helpful for parents to talk with their child about the disaster experience, if they can do so in a way that supported their child's sense of safety, discussed emotions in a healthy manner, and provided needed information to control worries (Carpenter et al., 2017). However, avoiding discussions of the flood altogether strengthened the association between flood exposure and child depression and anxiety symptoms. This is consistent with research suggesting that family communication characterized by silence, regardless of the intent of the silence, can prompt distress (Orom et al. 2012).

However, we found a different pattern for life stressors since the disaster. At low or mean levels of topic avoidance, increasing life stressors resulted in more anxiety and depression symptoms. But when topic avoidance was high, life stressors no longer differentiated between levels of symptoms, child symptoms were already high. Thus, high topic avoidance can be harmful, regardless of stress levels, which prior qualitative research supports (Orom et al. 2012).

Co-Rumination Moderated Post-Disaster Depression & Anxiety for Parents & Children

Co-rumination did impact both parents and children in the aftermath of the flood. For parents, there were no relations between flood exposure and depression or anxiety when co-rumination was low or mean-level. However, flood exposure increased risk for depression and anxiety at high levels of co-rumination. A similar pattern emerged for children. At low levels of co-rumination, there was no association between flood exposure and depression or anxiety symptoms, but there was at high levels of co-rumination. In addition, for mean levels of co-rumination, there was a relation between flood exposure and child anxiety. This supports that co-rumination can amplify distress (e.g., Rose, 2002; Rose et al., 2017), and indicates that children may be particularly sensitive to this, as at even average levels we start to see its role in influencing on anxiety symptoms, and at high levels on both anxiety and depression symptoms. Prior research has suggested that if parents expressed excessive worry about safety following a human-made disaster, that this was related to child distress (Carpenter et al., 2017).

The role of co-rumination in contending with life stressors since the disaster is more nuanced, and warrants further investigation to clarify. For parents, co-rumination did not have a role in the relation of life stressors and depression or anxiety symptoms. For children, there was a significant, positive association between life stressors and child depressive or anxiety symptoms when co-rumination was either at the mean or lower. No significant association existed between life stressors and child depressive or anxiety symptoms when family co-rumination was high, perhaps because symptoms were already high.

Implications for Research and Practice

Evidence-informed guidelines for talking to children about natural and human-made disasters exist through the National Child Traumatic Stress Network (nctsn.org) and provide useful suggestions for the immediate aftermath of a potentially traumatic event. However, our research, conducted approximately one year after several floods impacted Texas, shows that communication styles may continue to influence the impact of the natural disaster on MH. This was especially true for children, but we also saw some associations with parent MH. Therefore, our guidance for families on communication needs to extend beyond the initial impact and recoil phase, to the longer-term recovery phase, and needs to help families balance how much to discuss, as both topic avoidance and co-rumination can be problematic to family members' MH. Our study employed self-report surveys from both parents and their child. To continue to build the evidence-base on post-disaster communication, we need research that observes how families actually communicate over time post-disaster, and/or tests interventions to help improve post-disaster communication.

Strengths, Limitations and Future Directions

A strength of this study is the large number of parent-child dyads that allowed us to test the role of different family communication behaviors. We also explored the impact on a variety of MH symptoms post-disaster. Most post-disaster research is focused on PTSS, sometimes to the neglect of other common MH outcomes (Rubens et al. 2018). If we had only focused on PTSS in this study, we would have had an incomplete picture of the possible role of topic avoidance and co-rumination in the aftermath of a disaster, as they did not moderate the association between flood exposure and PTSS. However, they did play a role in post-disaster depression and anxiety symptoms.

Despite these strengths, there are limitations to note that can help guide future research. Our study is cross-sectional, and longitudinal research would help discern how different communication patterns may influence and/or interact with MH over time. Our surveys were approximately a year post-disaster, and recall bias could have affected the accuracy of some measures, such as flood exposure. Other measures were asking about their current MH and communication, so provide a picture of the long term effects of disaster, not immediate or short-term (under a year). We sampled families after a natural disaster, and human-made disasters may or may not have different influences on communication. We know that human-made disasters have stronger relations to distress than natural disasters (Norris et al., 2002). Similarly, this research only explored one type of disaster, flooding, and needs to be replicated with other types of disasters, at various short and long-term time frames post-disaster. Multiple floods occurred in a one-year time frame, making it prohibitive in terms of

survey length and participant fatigue to ask about exposure to each; hence, we cannot disentangle the experience of one flood versus multiple floods. Finally, our sample is not a representative sample, and future research would benefit from this ability to generalize.

Conclusion

In sum, research exploring the family processes that can promote or hinder the adjustment of family members post-disaster is needed. This study supports the examination of communication processes, like topic avoidance and co-rumination, and their impact on family MH, particularly for children. Topic avoidance may be detrimental on child MH post-disaster, but so can co-rumination. Helping support healthy communication practices that reduce the likelihood of either topic avoidance or co-rumination can be a public MH promotion strategy post-disaster.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Funding: This study was funded through 1R03HD077164-01A1 the National Institute of Child Health and Human Development

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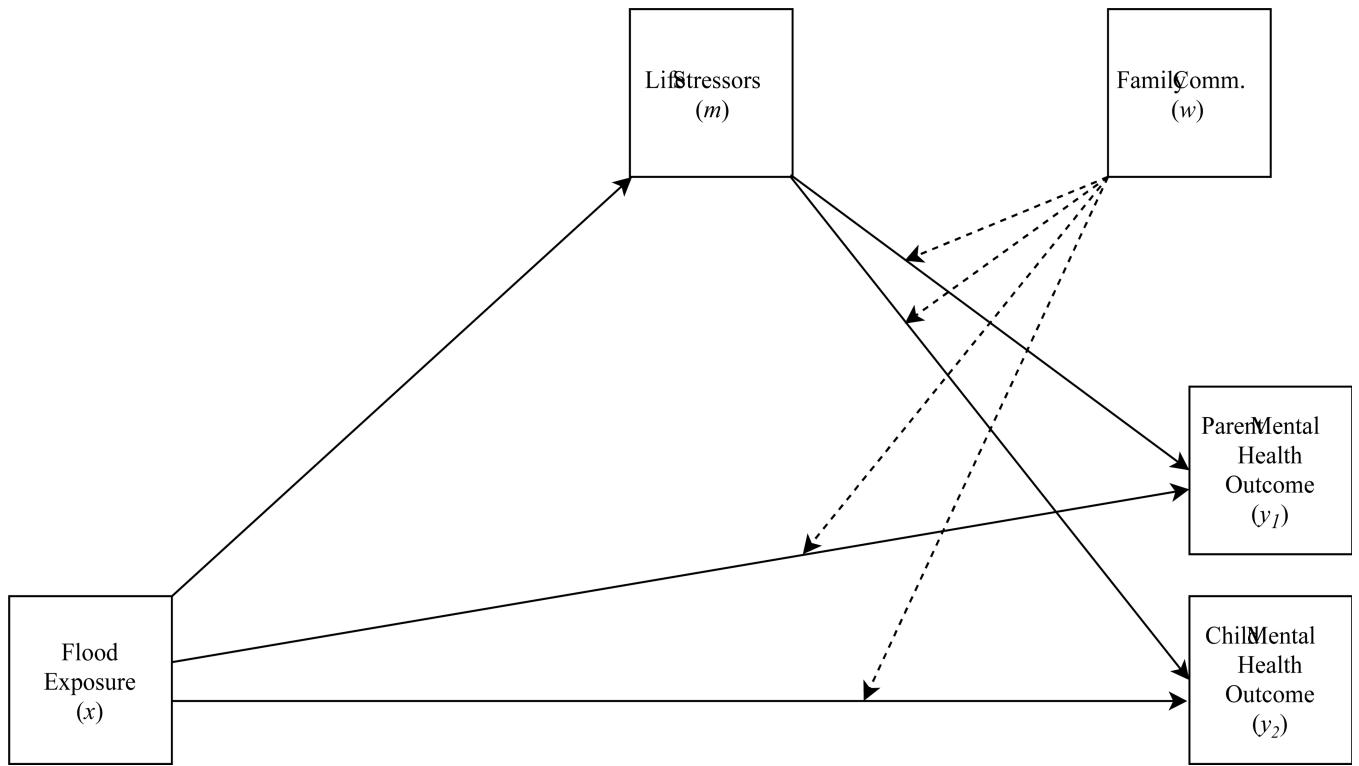


Figure 1.
Path diagram of conceptual structural equation model.

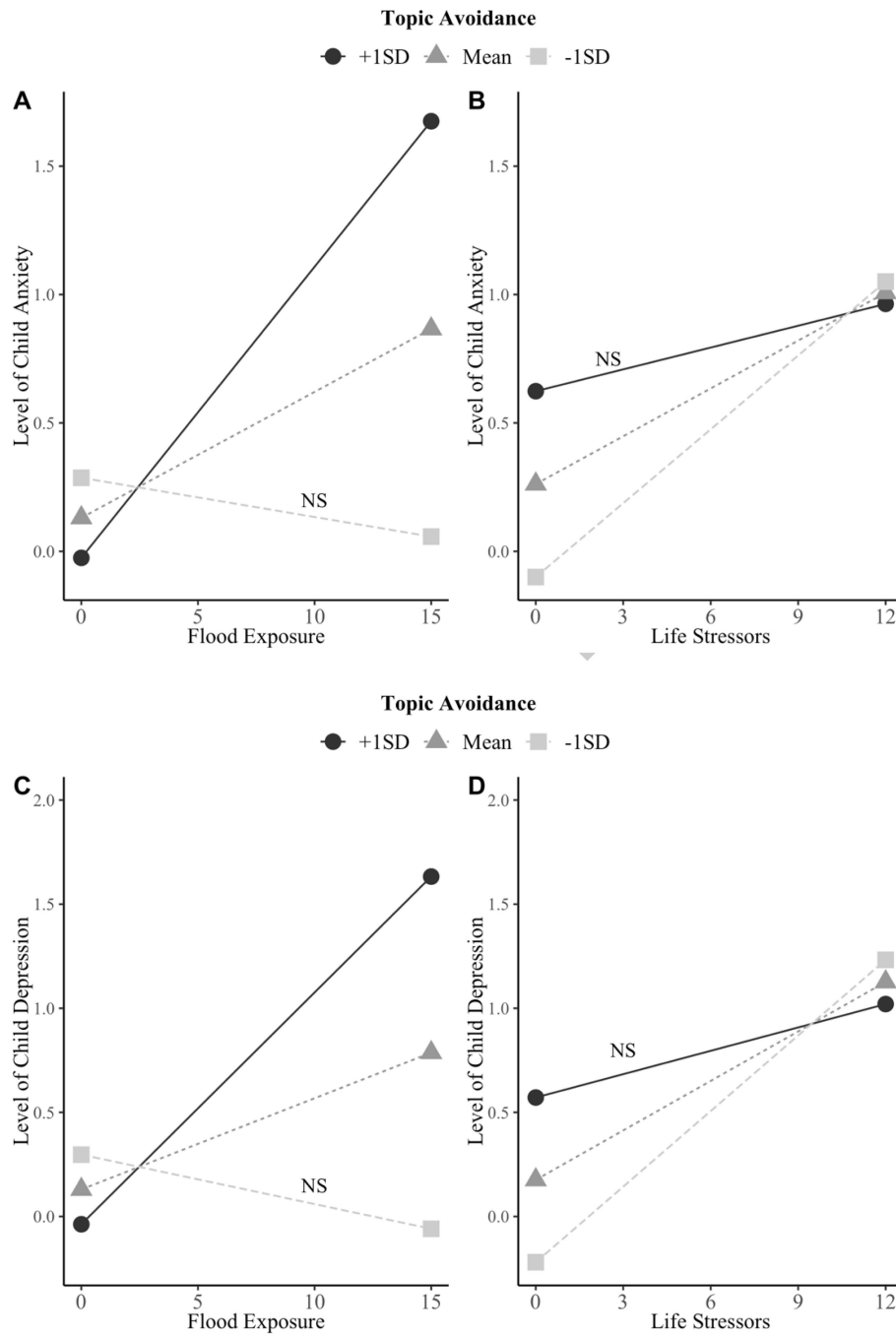


Figure 2. Topic avoidance moderates the association between flood exposure / life stressors and child anxiety and depression.

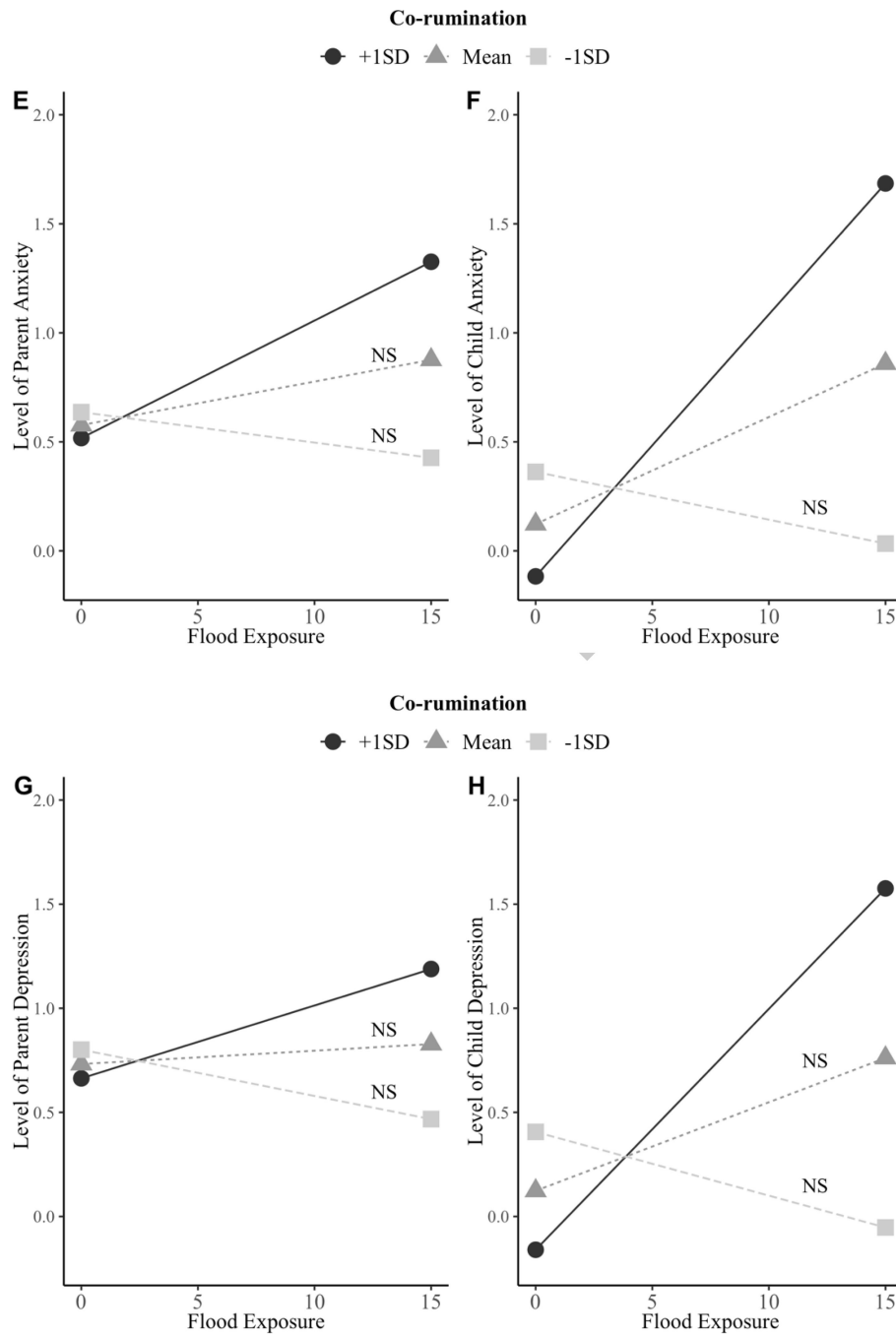


Figure 3. Co-rumination moderates the association between flood exposure and parent/child anxiety and depression.

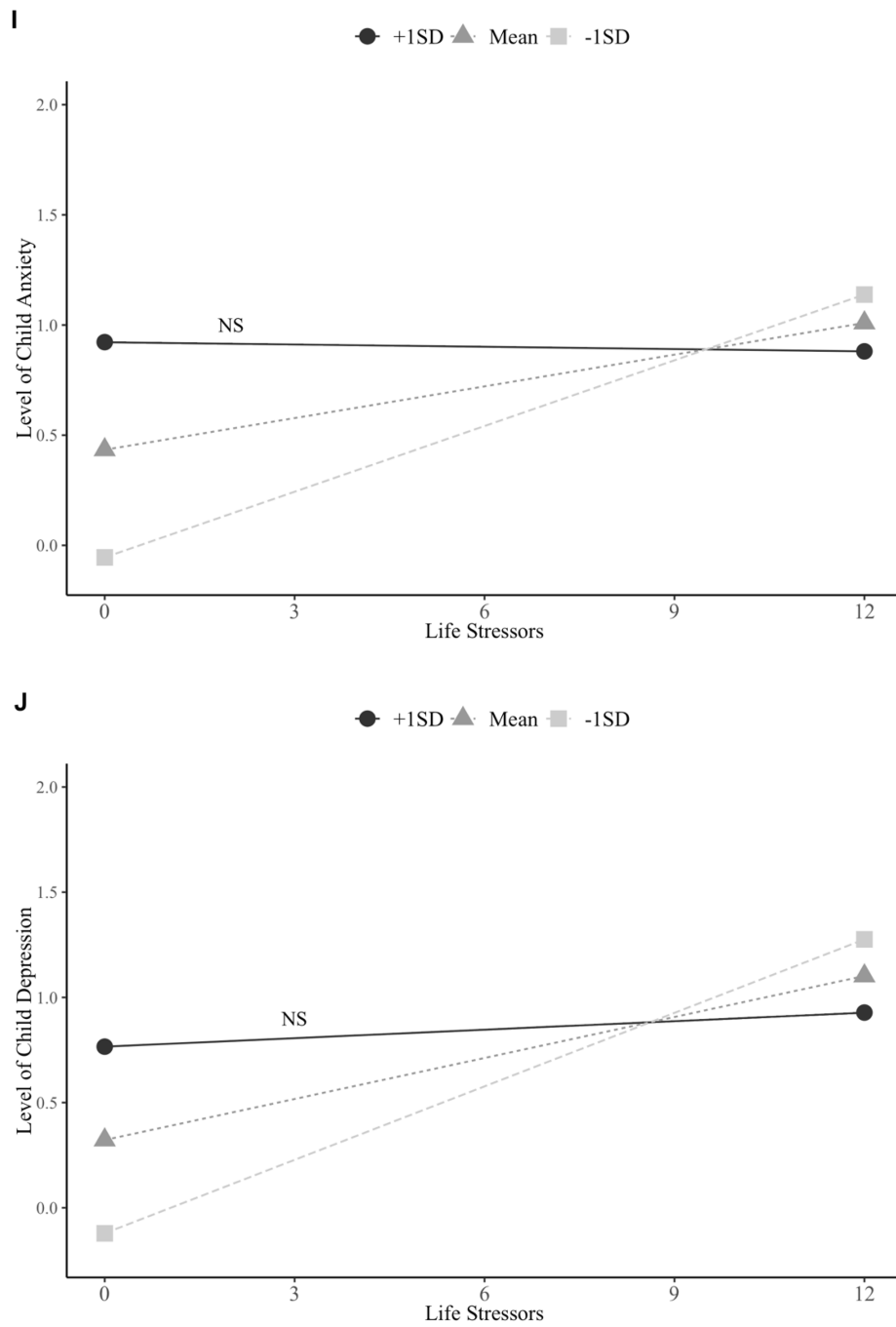


Figure 4. Co-rumination moderates the association between life stressors and child anxiety and depression

Table 1

Structural Equation Model Path Coefficients with Topic Avoidance as a Moderator

Path	PTSS		Depression		Anxiety	
	Parent	Child	Parent	Child	Parent	Child
Exposure → Life Stressors	.15 (.01), $p < .001$	.15 (.01), $p < .001$	.15 (.01), $p < .001$	.15 (.01), $p < .001$	.15 (.01), $p < .001$	.15 (.01), $p < .001$
Exposure → MH	1.18 (.29), $p < .001$	1.38 (.45), $p = .002$	-.01 (.03), $p = .729$	-.10 (.03), $p < .001$	.00 (.03), $p = .965$	-.09 (.03), $p = .001$
Life Stressors → MH	.32 (.33), $p = .341$	.46 (.49), $p = .355$	.12 (.03), $p < .001$	.17 (.04), $p < .001$	.09 (.03), $p = .013$	.13 (.03), $p < .001$
Moderator of Exposure → MH	-.11 (.08), $p = .184$	-.04 (.13), $p = .783$	.01 (.01), $p = .567$	.04 (.01), $p < .001$	.01 (.01), $p = .435$	.04 (.01), $p < .001$
Moderator of Life Stressors → MH	.02 (.09), $p = .839$	-.02 (.14), $p = .912$	.00 (.01), $p = .689$	-.03 (.01), $p = .007$	.00 (.01), $p = .746$	-.02 (.01), $p = .016$

Note. The coefficient is in logit scale. The standard error is in parentheses.

Table 2

Structural Equation Model Path Coefficients with Co-Rumination as a Moderator

Path	PTSS		Depression		Anxiety	
	Parent	Child	Parent	Child	Parent	Child
Exposure → Life Stressors	.15 (.01), $p < .001$	.15 (.01), $p < .001$	.15 (.01), $p < .001$	.15 (.01), $p < .001$	.15 (.01), $p < .001$	.15 (.01), $p < .001$
Exposure → MH	.73 (.28), $p = .009$	.91 (.41), $p = .026$	-.07 (.03), $p = .023$	-.15 (.04), $p < .001$	-.07 (.03), $p = .021$	-.13 (.03), $p < .001$
Life Stressors → MH	.96 (.34), $p = .005$	1.41 (.48), $p = .003$	.18 (.04), $p < .001$	.17 (.04), $p < .001$	.12 (.03), $p < .001$	.16 (.04), $p < .001$
Moderator of Exposure → MH	.01 (.09), $p = .917$	.13 (.14), $p = .331$	.03 (.01), $p = .009$	.07 (.01), $p < .001$	.03 (.01), $p = .002$	.07 (.01), $p < .001$
Moderator of Life Stressors → MH	-.16 (.11), $p = .158$	-.29 (.16), $p = .073$	-.02 (.01), $p = .223$	-.03 (.02), $p = .048$	-.01 (.01), $p = .593$	-.03 (.02), $p = .028$

Note. The coefficient is in logit scale. The standard error is in parentheses.