Random Intercept Cross-Lagged Relations among Trauma Coping Self-Efficacy, Trauma Coping, and PTSD Symptoms among Rural Hurricane Survivors

Heather Littleton[1,2]

Michael L. Dolezal[1]

Ashley Batts Allen[3]

Charles C. Benight[1]

Keywords: PTSD, Recovery, Coping Self-Efficacy, Coping Behaviors, Disaster

Funding Details: This work was supported by the National Science Foundation under RAPID Grant 1916676

Disclosure of Interest: The authors report there are no competing interests to declare.

Data Availability: Data are available at https://doi.org/10.17605/OSF.IO/JK8X5

[1] Lyda Hill Institute for Human Resilience, University of Colorado Colorado Springs, Colorado Springs, CO

[2] Department of Psychology, East Carolina University, Greenville, NC

[3] Department of Psychology, University of North Carolina, Pembroke, Pembroke, NC

Abstract

Background and Objectives: The trajectories of recovery and non-recovery following a disaster are well-documented, but the mechanisms of post-disaster adaptation remain poorly understood. Rooted in social cognitive theory and the transactional model of stress and coping, this study longitudinally investigated the reciprocal relations among coping self-efficacy (CSE), coping behaviors (approach and avoidant), and posttraumatic stress symptoms (PTSS) among highly exposed hurricane survivors. **Design:** 261 Hurricane Florence survivors completed measures of hurricane-related CSE, coping behaviors, and hurricane-related PTSS across three timepoints, beginning 5 to 8.5 months after Hurricane Florence. **Method:** Random-intercept cross-lagged panel models investigated the relations among study variables. **Results:** Reciprocal, cross-lagged relations were identified between higher CSE and approach coping from T2 to T3. The lagged relations between approach coping at T1 and T2 were significant, as well as between avoidant coping at T2 and T3. Significant cross-sectional relations were also present for CSE, coping behaviors, and PTSS at T3. **Conclusions:** Results provide partial support for the positive feedback loop involving CSE and approach coping, but not for the negative feedback loop involving avoidant coping. CSE may be an important mechanism in longer-term disaster recovery, in part by increasing use of approach coping.

Introduction

The psychological toll of disasters, including hurricanes, earthquakes, and wildfires, has been well-documented; survivors often report posttraumatic stress symptoms (PTSS) as well as other types of psychological distress such as depression, anxiety, and grief (Beaglehole et al., 2018; Benight et al., 1999b; Benight et al., 1999c), that persist following the disaster. Further, disasters frequently result in significant social and economic losses that may go unresolved for months and years. These include obtaining financial assistance in repairing damaged property and replacing losses, seeking new employment following disaster-related job loss, obtaining new housing and/or relocating, contending with chronic health effects of the disaster, and rebuilding essential community relationships, all further complicating psychological recovery (Kaniasty & Norris, 2004; Tran & Wilson, 2022). Expectedly, individuals who report experiencing greater disaster-related losses also are more likely to experience significant and persistent psychological distress post-disaster (Lowe et al., 2015a).

However, despite these significant and ongoing recovery challenges, most survivors effectively navigate these challenges without experiencing lasting deleterious psychological effects; upwards of 90% of disaster survivors do not go on to develop any long-term, disaster-related psychological distress (Pietrzak et al., 2012). Interpersonal and intrapersonal resources such as social support, coping strategies, and coping self-efficacy (CSE) may be especially protective, as they have been associated with less severe post-disaster psychological distress over time (Lowe et al., 2015a; Lowe et al., 2015b). Thus, most disaster survivors appear to successfully adapt to the post-disaster psychological recovery demands, and CSE and resources may be especially helpful facilitating adaptation.

Because existing research has documented the trajectories of recovery and non-recovery following a disaster (e.g., Lowe et al., 2015a; Lowe et al., 2015b; Pietrzak et al.,

2012) we now understand that psychological recovery is often the norm following disasters and have some understanding of *who* is more likely to recover, but our understanding is lacking regarding *how* individuals recover. Furthermore, of the studies that have explored mechanisms of recovery, most have investigated these mechanisms at the group, rather than the individual, level. This is a notable limitation given that the aforementioned trajectory studies provide compelling evidence that post-disaster recovery processes are heterogeneous, and therefore group-level statistical analyses cannot fully capture this heterogeneity. Thus, the purpose of this study was to better understand how hurricane survivors manage ongoing recovery challenges in the longer-term aftermath of Hurricane Florence, and to investigate these processes on an individual level. Based on a strong theoretical and empirical foundation, we investigated the longitudinal reciprocal relations among disaster-related CSE, coping behaviors, and PTSS.

Specifically, we utilized a social cognitive framework to understand disaster recovery, rooted in both social cognitive theory (SCT; Bandura, 1986) and stress coping theories (Lazarus & Folkman, 1986; Snyder & Pulvers, 2001). Building upon SCT, Benight and Bandura (2004) theorized that a positive feedback loop exists among CSE, defined as one's appraisals that one can cope effectively with a stressor, coping behaviors, and PTSS. Specifically, they posited that higher CSE contributes to less severe threat appraisals, which in turn results in lower distress (i.e., less severe PTSS), more behavioral engagement with said threats (e.g., approach coping behaviors), and thus more rapid psychological recovery (e.g., less severe PTSS). Existing stress coping frameworks compliment this postulation well; there is compelling theoretical rationale that coping behaviors which actively engage with the stressor (i.e., approach coping behaviors) are more effective in the long-term compared to coping behaviors which seek to distance oneself from the stressor (i.e., avoidant coping behaviors; Lazarus & Folkman, 1986; Snyder & Pulvers, 2001).

These theories suggest that cognitive appraisals of both the stressor and one's coping resources play a determinant role in the coping strategies individuals choose to utilize. That is, if an individual perceives a stressor as exceeding their available coping resources, they regard their only coping option as avoidant strategies. Whereas these avoidant strategies may provide temporary relief for distress, they do not effectively resolve the stressor. Further, engaging in avoidant coping strategies can paradoxically lead to increased stressor-related thoughts and emotions, and thus increased distress over time as the individual is unable to successfully resolve the stressor nor suppress negative stressor-related thoughts and feelings (Snyder & Pulvers, 2001). The combination of SCT and coping theories therefore suggest two different feedback loops. First, these theories suggest a positive feedback loop in which reciprocal relations exist among higher CSE, greater use of approach coping behaviors, and less severe PTSS. Second, they also suggest a negative feedback loop in which reciprocal relations exist among lower CSE, greater use of avoidant coping behaviors, and more severe PTSS.

Congruent with SCT's theory that CSE is integral in the recovery process, studies of disaster survivors have found that higher CSE is cross-sectionally associated with less posttraumatic distress (r_s = -.46 to -.75, Benight & Harper, 2002; Benight et al., 1999b; Benight et al., 1999c; Bosmans et al., 2013) and buffers against the onset or worsening of posttraumatic distress over time (r_s = -.50 to -.74, Benight et al., 2000; Benight & Harper, 2002; Benight et al., 1999b). While limited to only correlational findings, there is also evidence suggesting that disaster survivors reporting higher CSE rely on fewer avoidant coping behaviors (r_s = -.28 to -.42, Benight et al., 1999b; Pooley et al., 2013). The evidence is more mixed for approach coping behaviors, as one study found a significant but relatively weak relation suggesting higher CSE was associated with more use of approach coping

behaviors (r = .15, Pooley et al., 2013) whereas another found the two were not related (r = -.03, Benight et al., 1999b).

Comparatively few studies have investigated the relations among coping behaviors and PTSS among disaster survivors. Of this work, findings suggest that engaging in more avoidant coping behaviors is generally associated with more severe PTSS both cross-sectionally (r_s = .19 to .75, Bistricky et al., 2019; Glass et al., 2009; Pooley et al., 2013; Sprang & LaJoie, 2009) and longitudinally (β = .51, Bistricky et al., 2019; OR = 2.96 – 4.24, Feder et al., 2016). The evidence regarding the relations between approach coping behaviors and PTSS is less clear. There is limited evidence suggesting more approach coping behaviors are longitudinally associated with less severe PTSS (r = -.27, Wadsworth et al., 2009), but other longitudinal research suggests that using more approach coping is associated with subsequent increases in PTSS (β = .11, Bistricky et al., 2019; r = .39 - .56, Sattler et al., 2014). These findings perhaps illustrate the complexity of the coping-PTSS relation in post-disaster contexts, but it is difficult to draw conclusions based on this limited work.

To our knowledge, only three studies have evaluated CSE, coping behaviors, and PTSS among disaster survivors, but no study has investigated the reciprocal relations among these three constructs in their entirety. Correlational data from Australian cyclone survivors paints a mixed picture of the relations among CSE, coping behaviors, and PTSS, finding that those who reported higher CSE tended to report less severe PTSS, and that more use of task-focused approach coping behaviors, as well as less use of avoidant coping behaviors, were correlated with higher CSE. Additionally, individuals who used more avoidant coping and emotion-focused coping behaviors tended to report more severe PTSS (Pooley et al., 2013). Unfortunately, this study did not conduct more complex analyses of these relations beyond describing the correlations. Wadsworth and colleagues (2009) found that those who experienced less severe PTSS following a hurricane reported using more approach coping

compared to those who experienced more severe PTSS, though groups in this study did not significantly differ in CSE. Finally, Benight and colleagues (1999b) found that reporting higher CSE in the acute aftermath of a hurricane was cross-sectionally associated with less use of avoidant coping behaviors and less psychological distress, while using more approach coping was associated with less psychological distress 8-12 months later.

Though these studies provide some evidence that coping behaviors and CSE are important in post-disaster recovery, there are limitations worth noting. First, two of the three studies that have assessed CSE, coping behaviors, and PTSS (Pooley et al., 2013; Wadsworth et al., 2009) did not fully explore the reciprocal interrelations theorized by SCT. Benight and colleagues' (1999b) study is, to our knowledge, the *only* study to investigate the interrelations among CSE, coping behaviors, and distress, but investigated general psychological distress rather than PTSS specifically. Moreover, they only collected data at two timepoints and only investigated unidirectional, rather than reciprocal, relations among CSE, coping behaviors, and psychological distress. Finally, each of the studies that has investigated relations among some combination of CSE, coping behaviors, and PTSS has done so at the group level, often only relying on cross-sectional data to explore these relations. To truly understand recovery *processes,* we must investigate temporal relations. Furthermore, given that we now know that recovery processes are heterogeneous, it is necessary to investigate these processes at the individual level. Thus, in addition to addressing the general lack of literature investigating post-disaster coping and recovery, methodology and statistical models that can more fully disentangle the bidirectional relations among these constructs is needed.

Cross-lagged panel models (CLPMs) may be an especially advantageous statistical approach to understanding the interrelations among CSE, coping, and PTSS at the individual level, as CLPMs allow researchers to investigate longitudinal reciprocal relations among constructs. Further, existing research using CLPMs helps illuminate these possible reciprocal

relations in samples of survivors of other types of traumas. Bosmans and van der Velden (2015, 2017) investigated the relations among CSE, PTSS, and personality traits using observed variables among two large, mixed-trauma samples. The first found significant cross-lagged, reciprocal relations between higher initial CSE and lower PTSS at four-month follow-up, as well as between CSE at four-month follow-up and PTSS at eight-month follow up, but the cross-lagged relations between PTSS and subsequent CSE were not significant (Bosmans & van der Velden, 2015). In the second study, higher CSE was again consistently associated with subsequent lower PTSS, but, in contrast to the first study, the second identified significant cross-lagged relations between more severe PTSS and lower CSE that strengthened over two years (Bosmans & van der Velden, 2017). Taken together, these two studies suggest that CSE is a key determinant of PTSS severity, while experiencing sustained PTSS may begin to erode CSE over time. Finally, one study investigated the cross-lagged, reciprocal relations between avoidant coping behaviors and PTSS using latent variables among 368 college women exposed to the Virginia Tech campus shooting. PTSS contributed to avoidant coping behaviors between two and six months, as well as between six months and one year, whereas the lagged relations between avoidant coping behaviors and PTSS were not significant (Littleton et al., 2011).

While advantageous at disentangling reciprocal relationships, one criticism of CLPM approaches is that they do not fully disentangle between- and within-person influences, and spurious findings are also possible especially when modeling with observed variables as Bosmans and van der Velden (2015, 2017) did. The random intercept CLPM (RI-CLPM) was developed to address these limitations (see Method for more detail; Hamaker, 2018). There are currently no studies to date that have used an RI-CLPM approach to investigate the potential reciprocal relations among CSE, coping behaviors, and PTSS altogether and

disentangle the within- and between-person temporal relations, nor are there any studies that have investigated these relations among disaster survivors.

The current study therefore evaluated the within-person reciprocal relations among CSE, coping behaviors, and PTSS in a sample of rural North Carolina (NC) residents exposed to Hurricane Florence survivors. This hurricane made landfall in the Southeastern United States in September 2018. The Sandhills region of NC was especially affected by catastrophic flooding, and this same region had also suffered similar damage from Hurricane Matthew just two years prior. As such, residents of this region were forced to cope with new hurricane-related stressors while also continuing to navigate ongoing stressors resultant from Hurricane Matthew. We specifically tested two models using RI-CLPM: (1) A model involving cross-lagged relations among hurricane-related CSE, approach coping behavior, and PTSS, and (2) a model involving cross-lagged relations among hurricane-related CSE, avoidant coping behaviors, and PTSS. In accordance with the existing theory and literature, we hypothesized that significant reciprocal relations among higher CSE, more approach coping behaviors, and lower PTSS would exist over time, while reciprocal relationships among lower CSE, more avoidant coping behavior, and more severe PTSS would exist over time.

Methods

Participants

Participants were 261 adults residing in four rural NC counties recruited to participate in a study of individuals experiencing high levels of hurricane-related stress and ongoing hurricane-related challenges. Ages ranged from 19 to 81 (M = 44.0 years, SD = 12.8). Most (88.5%, n = 231) were women. A total of 52.5% (n = 137) identified as White, 25.3% (n = 66) as Black, and 17.2% (n = 45) as Native American (primarily Lumbee). Fewer identified as Asian American (0.4%, n = 1), multiracial (1.1%, n = 3), or other (3.4%, n = 9). A total of 2.3% (n = 6) were Hispanic/Latinx. As far as education, 6.9% (n = 18) did not complete high

school, 21.5% (*n* = 56) completed high school/earned their GED, 32.2% (*n* = 84) had some post-secondary education, and 39.5% (*n* = 103) graduated from college. A total of 61.3% (*n* = 160) had dependent children in their home, and 53.3% (*n* = 139) had a household income of $30,000 U.S. dollars or less.

Procedures

Residents of four rural NC counties were recruited to participate in a study for individuals who "experienced high levels of hurricane-related stress," 5 to 8.5 months following the U.S. landfall of Hurricane Florence. Participants were recruited through social media ads, online newspaper ads, local media stories, door-to-door recruitment, tables/fliers at community events, and word of mouth. To be eligible, individuals had to be over the age of 18, to have resided in one of the four study recruitment counties when Hurricane Florence made landfall, to have been exposed to high levels of hurricane-related stress, to still be experiencing the negative effects of Hurricane Florence in their daily life, and to own a smartphone with a data plan.

A total of 426 individuals provided written consent to participate and initiated the T1 survey, hosted on Qualtrics. Of these individuals, 11.5% (*n* = 49) were ineligible because they denied on a yes/no screening item that they were still experiencing impacts from the hurricane on their daily life, 4.0% (*n* = 17) were ineligible because they denied that they were exposed to high levels of hurricane-related stress (e.g., flood damage, loss of possessions, loss of employment), 1.2% (*n* = 5) were ineligible because they did not reside in one of the four recruitment counties when the hurricane made landfall, less than 1% (*n* =2) were ineligible due to being under 18, and 1.2% (*n* = 5) were ineligible because they did not own a smartphone with a data plan. An additional 19.5% (*n* = 83) of individuals who initiated the T1 survey did not complete it, and less than 1% (*n* = 4) asked to be removed from the study

after completing the T1 survey. In total, 261 (61.3%) individuals who initiated the T1 survey were eligible and enrolled.

The baseline (T1 survey) consisted of eligibility questions followed by measures of hurricane stressor exposure, hurricane-related CSE, hurricane-related coping efforts, hurricane-related PTSS, and other measures not utilized in the current study. Three months and six months after completing the baseline survey, all participants were contacted via text message to complete the T2 and T3 surveys in Qualtrics and received up to four weekly text reminders to complete the surveys. The T2 and T3 surveys contained similar measures as the T1 survey. Participants received a $10 gift card for completing the baseline (T1) survey, and a $25 gift card for completing each of the T2 and T3 surveys. The study was approved by the East Carolina University IRB. In addition, all participants received a list of local hurricane-related resources at the end of each survey.

A total of 69.7% (n = 182) of T1 participants completed the T2 survey. There were no significant differences in age, gender, race, ethnicity, relationship status, postsecondary education, or low-income status (annual household income $30,000 or less) between individuals who completed the T2 survey and those who did not. Individuals who completed T2 (11.0%, n = 20) were significantly less likely to report they lost their job following Hurricane Florence compared to those who did not complete T2 (21.5%, n = 17), χ^2 (1, N = 261) = 5.02, p = .025. There were no other significant differences in hurricane stressor exposure between those who completed T2 and those who did not. A total of 60.5% (n = 158) of T1 participants completed the T3 survey. There were no significant differences in age, gender, race, ethnicity, relationship status, postsecondary education, or low-income status between individuals who completed the T3 survey and those who did not. Individuals who completed T3 (5.7%, n = 9) were significantly less likely to report their spouse or partner lost their job following Hurricane Florence compared to those who did not complete T3 (13.6%, n

= 14), χ^2 (1, N = 261) = 4.84, p = .028. There were no other significant differences in hurricane stressor exposure between those who completed T3 and those who did not.

Measures

Hurricane Stressor Exposure

Participants were administered 24 yes-no items regarding exposure to hurricane stressors at T1 only. These items assessed flood-related losses (e.g., home damage, loss of possessions), exposure to contaminants (e.g., mold in the home, contaminated water), loss of employment, displacement, development/worsening of physical and mental health conditions in connection to the hurricane, and loss of family pet(s). In addition to assessing participant exposure to stressors (e.g., job loss, development of a physical or mental health condition), items also assessed stressors experienced by the participant's spouse/partner (e.g., spouse/partner job loss, spouse/partner development of a physical or mental health condition), and stressors experienced by the participant's dependent children (e.g., child developed a physical or mental health condition)

Hurricane-Related PTSS

The PTSD-Checklist for DSM-5 (PCL-5) was administered to assess hurricane-related PTSS (Weathers et al., 2013). The PCL-5 consists of 20 items which correspond with DSM-5 PTSD criteria. Items were modified so that at each assessment, participants indicated how much they have been bothered by each symptom *over the past month* in connection to the hurricane on a 5-point rating scale bounded by 0 (*not at all*) and 4 (*extremely*). A sample item is: "Repeated, disturbing, and unwanted memories of the hurricane?" Scores are summed and can range from 0 to 80 with a cutoff score of 33 for likely current PTSD (Bovin et al., 2016). The PCL-5 has demonstrated good internal consistency in a sample of hurricane survivors (α = .93; Lowe et al., 2015). In the current study, Cronbach's α for the PCL-5 across assessments was excellent: T1 = .95, T2 = .95, T3 = .96.

Hurricane-Related Coping

The 32-item short form of the Coping Strategies Inventory was administered (CSI-32; Tobin, 1995) to assess hurricane-related coping efforts. For each item, individuals indicated the extent to which they had used each strategy in handling their experience with Hurricane Florence on a five-point scale bounded by 1 (*not at all*) and 5 (*very much*). At T1, they indicated how often they had used the strategy overall in handling their experience with Hurricane Florence, at T2 and T3 they indicated how often they had used that strategy in handling their experience with Hurricane Florence in the past three months. Items are divided into two engagement (approach) and two disengagement (avoidance) coping subscales including problem-focused engagement ("I tackled the problem head on"), emotion-focused engagement ("I let out my feelings to reduce stress"), problem-focused disengagement ("I avoided thinking or doing anything about the situation"), and emotion-focused disengagement ("I avoided my family and friends"). The two engagement scales were summed to produce an overall approach coping scale. Cronbach's α for the problem-focused disengagement subscale was not acceptable across assessments: T1 = .50, T2 = .67, T3 = .60. Thus, scores on the emotion-focused disengagement subscale were used to assess avoidance coping at each assessment. Cronbach's α for the approach coping subscale across assessments was excellent: T1 = .91, T2 = .95, T3 = .94. Cronbach's α for the emotion-focused avoidance coping subscale across assessments was acceptable: T1 = .89, T2 = .90, T3 = .90.

Hurricane Coping Self-Efficacy

To assess hurricane-related CSE, the 9-item Trauma CSE Scale (Benight et al., 2015) was administered along with six additional items from the Hurricane Coping Self-Efficacy Scale (Benight et al., 1999a). For each item, individuals indicated how confident they were *right now* in their ability to manage each hurricane-related recovery demand on a 7-point rating scale bounded by 1 (*I am not at all capable*) and 7 (*I am totally capable*). Sample items

are: “Managing distressing dreams or images about the hurricane” and “Maintaining financial security-obtaining financial resources either through employment or assistance.” A mean hurricane related CSE score was calculated utilizing all items. Both the Trauma and Hurricane CSE Scales have previously demonstrated good internal consistency (α = .88–.91 among disaster survivors, Benight et al., 2015; Hyre et al., 2008). Cronbach’s α for the measure across assessments was excellent: T1 = .96, T2 = .96, T3 = .97.

Analysis Plan

Two random intercept cross-lagged panel models (RI-CLPM) were conducted in Mplus (version 8.0; Muthén & Muthén, 1998-2017) to examine the relations among approach and avoidance coping, hurricane-related CSE, and PTSS across the three assessments (T1-T3). The first RI-CLPM included the approach coping subscale scores at each timepoint. The second RI-CLPM included the emotion-focused avoidance coping subscale scores at each timepoint. Huricane-related CSE and PCL-5 scores at each timepoint were included in both RI-CLPM models. Analyses were conducted utilizing the Mplus syntax developed by Hamaker (2018). All variables were modeled as observed variables utilizing total scores at each assessment. RI-CLPM partials out between- and within-person variance in observed indicators over time; thus, cross-lagged parameters within this model thus reflect whether changes from an individual’s expected score on one variable in the model are predicted by deviations on the second variable in the model at an earlier observation point (Burns et al., 2020; Hamaker et al., 2015). In other words, a significant cross-lagged relation indicates that those reporting above/below their individual average in X at T1 tended to report above/below their individual average in Y at T2. RI-CLPM is preferred over traditional cross-lagged panel modeling because it accounts for the extent to which stability in constructs over time is reflective of the trait-like, time invariant nature of said constructs (Hamaker et al., 2015). Traditional cross-lagged panel modeling’s inability to account for this stability in constructs

modeled can lead to inflated results regarding the causal nature of the relations between constructs (Hamaker et al., 2015). All paths were freely estimated as we had no a priori hypotheses that model paths would not vary over time.

Missing data on study variables was infrequent, ranging from 0% (T2 PTSS) to 2.5% (T3 CSE). Missing data, including attrition at T2 and T3, were handled using full information maximum likelihood (FIML) estimation. FIML provides unbiased estimates of model parameters and standard errors when data are missing at random or completely at random. To reduce bias in model estimates, participant job loss and participant spouse/partner job loss were included as auxiliary variables using the saturated correlates approach, given these hurricane stressors were associated with attrition at T2 or T3 (Graham, 2003). In the saturated correlates approach, auxiliary variables (those variables associated with missingness) are specified as being correlated with all exogenous variables in the model, as well as being correlated with the residuals of any variables that are predicted in the model (Graham, 2003). Finally, all auxiliary variables in the model (i.e., participant job loss, participant spouse/partner job loss) are specified as being correlated with each other (Graham, 2003).

Results

Descriptive Statistics

Participants reported being exposed to an average of 9.14 (*SD* = 4.30) of the 24 possible stressors, including home mold damage (72.8%, *n* = 190), home flooding (52.1%, *n* = 136), damage/loss of possessions (62.5%, *n* = 163), and extended displacement from the home (44.1%, *n* = 115). Other commonly experienced stressors included exposure to contaminants (66.3%, *n* = 173), having unsafe drinking water (57.5%, *n* = 150), loss of employment of two weeks or more (45.6%, *n* = 119) and development of a new or worsened mental health condition among the participants (66.7%, *n* = 174).

See Table 1 for descriptive statistics of study variables and Table 2 for correlations among study variables. Participants frequently reported hurricane related PTSS with 35.7% scoring above the clinical cutoff for probable PTSD at T1, 33.5% at T2 and 29.3% at T3. On average, participants reported engaging in low levels of emotion-focused avoidance coping, which increased slightly from T1 to T2 and remained stable from T2 to T3. On average they reported engaging in moderate levels of approach coping, which increased slightly from T1 to T2 and remained stable from T2 to T3. Finally, they reported moderate levels of CSE on average which increased slightly from T1 to T2 and remained stable from T2 to T3. Scores on all variables covered their entire possible range or nearly their entire possible range.

Random-Intercept Cross-Lagged Panel Models

Results of the RI-CLPM examining the relations among approach coping, self-efficacy, and PTSS are summarized in Table 3. Having higher CSE at T2 was significantly associated with engaging in more approach coping at T3, and engaging in more approach coping at T2 was significantly associated with higher CSE at T3. More approach coping at T1 significantly predicted engaging in more approach coping at T2. Results of the RI-CLPM examining the relations among emotional avoidance coping, CSE, and PTSS are summarized in Table 4. Engaging in more avoidance coping at T2 significantly predicted engaging in more avoidance coping at T3, and higher CSE at T2 significantly predicted higher CSE at T3.

We then elected to run two post-hoc RI-CLPM models based on the results from our primary models. Because there was a non-significant trend in both RI-CLPM models for T2 CSE to predict T3 PTSS, we ran an exploratory supplemental RI-CLPM including CSE and PTSS only (https://osf.io/6sn4j) to see if this path was significant in the more parsimonious (and therefore higher powered) model. The path from T2 CSE to T3 PTSS was significant, indicating that higher CSE at T2 was significantly associated less severe PTSS at T3.

There was also a non-significant trend for T2 PTSS to predict T3 avoidance coping in the primary RI-CLPM including avoidance coping. Therefore, we ran an exploratory supplemental RI-CLPM including avoidance coping and PTSS only (https://osf.io/r9a4w), to see if this path was significant in the more parsimonious (and therefore higher powered) model. The path from T2 PTSS to T3 avoidance coping was significant, indicating that more severe PTSS at T2 was significantly associated with more avoidance coping at T3.

Discussion

This is the first study to explicitly investigate the within-person positive and negative feedback loops posited by SCT among a sample of disaster survivors. Beginning at T2, hurricane survivors who reported engaging in more approach coping behaviors also reported significantly higher CSE at the same point in time. Moreover, relying on approach coping behaviors at T2 predicted higher CSE at T3 and vice versa, thus partially supporting our hypothesis of a positive feedback loop. This provides evidence for the within-person reciprocal relations between CSE and approach coping behaviors occurring between 8.5-12 months post-hurricane and 12.5-15 months post-hurricane.

However, CSE and approach coping behaviors were not significantly associated when assessed shortly after the hurricane occurred (between 5- and 8.5-months post-hurricane). This is consistent with Benight and colleagues' (1999b) findings that CSE and approach coping were not cross-sectionally related, and it is possible that the number and severity of stressors are so high in this period that approach coping efforts are only minimally effective. Indeed, many stressors that survivors face following a disaster, such as repairing a damaged home or waiting for insurance to compensate for lost property, cannot be alleviated by any one individual's coping efforts. In these instances, approach coping behaviors may be effective in beginning to address these stressors, but resolution of these stressors takes time and therefore the effectiveness of the approach coping behaviors may not fully manifest

within this period. Our study also extends on Benight and colleagues' study by assessing approach coping and CSE in the intermediate recovery term following a disaster, during which time we began to find support for the theorized relations between approach coping behaviors and CSE, suggesting that it may simply take a longer amount time for approach coping efforts to begin to influence CSE in the post-disaster environment. However, we recruited survivors experiencing continued distress many months after Florence made landfall, so it is possible that we sampled those whose hurricane-related stressors were more severe and/or less resolvable than others. Thus, it is possible that we sampled a specific group of individuals for whom the positive feedback loop was impeded by the nature of their stressors. Others may have been able to rely on approach coping and experience the positive feedback loop in the months after the hurricane, thus resolving distress by the time of recruitment and excluding them from the present study.

Our second model did not support our hypothesis of a negative feedback loop among CSE, avoidant coping, and hurricane-related PTSS, and did not find support for within-person cross-lagged relations among any constructs in the model. However, in this model reporting more severe hurricane related PTSS was significantly associated with using more avoidant coping behaviors at each of the three timepoints. This is not surprising given existing literature suggesting a strong relation between more severe PTSS and using more avoidant coping strategies (e.g., Hasselle et al., 2019; Littleton et al., 2011) and suggests that survivors in our sample were employing avoidant coping behaviors to cope with ongoing PTSS. It is worth noting that CSE, avoidant coping behaviors, and hurricane related PTSS were interrelated at the final time point, and this same pattern of relations was present in the model involving approach coping behaviors as well. Thus, it appears as though something psychologically significant may have occurred between the three- and six-month surveys.

Of note, T2 data collection occurred between May and September of 2019, which encompassed the beginning of the hurricane season. As a result, survivors were confronted with ongoing reminders that another hurricane may hit in addition to facing the one- and three-year anniversaries of Hurricane Florence and Hurricane Matthew, respectively. Being exposed to trauma reminders can increase PTSS (Glad et al., 2016), and therefore survivors likely experienced an addition of new coping challenges around the time they completed the T2 survey. Indeed, qualitative data collected from participants as part of an additional study aim supported that they frequently reported concerns about the onset of hurricane season as a trigger for increased PTSS and anxiety. These additional coping challenges may have kickstarted the positive and negative feedback loops. Indeed, it was only between T2 and T3 that we found reciprocal relations among CSE and approach coping behaviors.

The model investigating avoidant coping did not find significant within-person cross-lagged relations, though there were significant lagged relations between avoidant coping at T2 and T3, as well as between CSE at the same time points. As established by Snyder and Pulvers (2001), avoidant coping behaviors are effective at providing short-term relief. However, over time avoidant coping behaviors can instead lead to paradoxical increases in thoughts and emotions about the stressor which then often leads to non-productive and distressing rumination. This rumination leads to increased negative thoughts and emotions about one's inability to manage both the stressor and their distressing thoughts and emotions, thus leading to further avoidant coping behaviors. Applied to our results, it is likely that survivors who used avoidant coping behaviors in response to the stressors associated with the approaching hurricane season experienced this paradox, as captured by the significant within-person lagged relation between avoidant coping at T2 and T3. It is also possible that the long-term ineffectiveness of avoidant coping behaviors was only beginning to manifest by T3, and that one additional wave of data collection would have captured the negative feedback loop.

Although neither primary model found significant within-person cross-lagged relations involving hurricane-related PTSS, our supplemental analyses do provide evidence that within-person cross-lagged relations existed between CSE and PTSS, as well as between avoidant coping and PTSS. Specifically, in this model higher CSE at T2 was significantly associated with reduced hurricane-related PTSS at T3, while a statistical trend was present suggesting that using more avoidant coping behaviors at T2 may have increased the likelihood of experiencing more severe hurricane-related PTSS at T3. These findings compliment prior cross-lagged research which identified a unidirectional cross-lagged relation from CSE to PTSS (Bosmans & van der Velden, 2015, 2017), as well as from PTSS to avoidant coping (Littleton et al., 2011). Notably, the present study provides evidence of a reciprocal, rather than unidirectional, relation between CSE and PTSS, as well as provides more robust evidence for the within-person causal relations between CSE and PTSS. However, these supplemental models must be interpreted with a high degree of caution since the relations identified in these models were not present in the primary models. Additionally, running these additional models increases the risk for Type I error.

Limitations

One alternate explanation for why these relations were not present within the primary models is that our study is slightly underpowered. Larger sample sizes and more repeated measures can improve the statistical power of RI-CLPM, while having more freely estimated parameters requires a larger sample size to be adequately powered (Mulder, 2022). Though new tools exist to conduct power analyses for RI-CLPMs (e.g., Mulder, 2022), unfortunately these tools are not yet able to conduct power analyses for models with three or more variables. Thus, though three observations are enough for RI-CLPMs, adding more observations and increasing sample size would increase statistical power in the model and therefore may help clarify the relations that were sizeable but only trending toward

significance in the primary models. Further, given we hypothesized that there would be differences in distress and recovery-related behaviors over time, we elected not to constrain these model paths. Future research may seek to evaluate whether an unconstrained model fits the data better than one in which the proposed relations were constrained to not change over time (that is, where model paths are constrained to be equal across assessments).

The timing of observations is an additional limitation when attempting to understand the nuances of coping processes in the post-disaster environment. There is compelling theoretical evidence suggesting that recovery processes are dynamic, and that shifts in state can occur rapidly (e.g., Benight et al., 2020). Methodology such as ecological momentary assessment would allow for more precise measurement of post-disaster recovery processes. We also did not include the problem-focused disengagement scale due to poor internal consistency. Accordingly, our analyses did not capture the full breadth of survivors' avoidant coping behaviors. Studies with mixed trauma samples have found adequate internal consistency for this subscale (e.g., Hasselle et al., 2019), whereas one study among mass shooting survivors found that one of the subscales that make up the problem disengagement scale (wishful thinking) had unacceptably low internal consistency (Littleton et al., 2011). As the CSI has primarily been utilized with survivors of interpersonal traumas, it may be that this measure does not adequately assess the problem-focused avoidance strategies used by survivors of mass traumas and disasters. Finally, the sample for the present study was comprised of predominantly women, and we intentionally recruited individuals experiencing high levels of ongoing hurricane-related stress. Generalizability is limited to these respective groups, especially considering that those who did not meet the ongoing hurricane-related stress threshold for inclusion in the present study may have already experienced the positive feedback loop between approach coping behaviors and CSE. Similarly, the experiences of male hurricane survivors are likely not adequately captured in the present study.

Conclusion and Future Directions

Taken together, results from the present study provide evidence that CSE may contribute to both current and future use of more adaptive approach coping behaviors, and that using approach coping behaviors may increase CSE both in the present, and over time. Further, results provide evidence that experiencing PTSS can lead disaster survivors to rely more on avoidant coping strategies, and that high CSE can serve to reduce PTSS over time. Thus, results have notable implications for intervention with disaster survivors. Given the timeline of the current study, our results indicate that monitoring individuals' CSE and coping behaviors for sustained changes within the first 12-18 months following a disaster may indicate upcoming PTSS changes, and providing clinical intervention that specifically targets both approach coping and CSE in this timeframe may be especially helpful for individuals experiencing long-term recovery challenges. Moreover, if PTSS were indeed sustained by the presence of ongoing hurricane-related stressors, this suggests that providing more efficient aid to disaster-afflicted communities may have significant impacts on the psychological health and functioning of those within the communities.

The frequency of disasters, especially hurricanes, may be on the rise (Bhatia et al., 2019), suggesting that facing the threat of hurricane-related loss and distress may be becoming more the norm than the outlier for residents of coastal communities and surrounding areas. However, our understanding of psychological recovery processes following a disaster remains limited at best. Little is known about the nuance of recovery processes among disaster survivors, who live in highly unique contexts in which they continuously experience disaster-related environmental stressors which have notable implications for their psychological recovery. Thus, more research investigating the short- and long-term psychological recovery of disaster survivors is needed to better understand the unique complexity of coping with disaster-related distress, as well as to be able to provide

survivors with adequate psychosocial resources that help them effectively manage post-disaster challenges.

References

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Prentice-Hall, Inc.

Beaglehole, B., Mulder, R.T., Frampton, C.M., Boden, J.M., Newton-Howes, G., & Bell, C.J. (2018). Psychological distress and psychiatric disorder after natural disasters: A systematic review and meta-analysis. *British Journal of Psychiatry, 213*(6), 716-722. https://doi.org/10.1192/bjp.2018.210

Benight, C.C., & Bandura, A. (2004). Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Behaviour Research and Therapy, 42*(10), 1129-1148. https://doi.org/10.1016/j.brat.2003.08.008

Benight, C.C., Freyaldenhoven, R.W., Hughes, J., Ruiz, J.M., Zoschke, T.A., & Lovallo, W.R. (2000). Coping self-efficacy and psychological distress following the Oklahoma City bombing. *Journal of Applied Social Psychology, 30*(7), 1331-1344. https://doi/10.1111/j.1559-1816.2000.tb02523.x

Benight, C.C., & Harper, M.L. (2002). CSE perceptions as a mediator between acute stress response and long-term distress following natural disasters. *Journal of Traumatic Stress, 15*(3), 177-186. https://doi.org/10.1023/A:1015295025950

Benight, C.C., Ironson, G., & Durham, R.L. (1999a). Psychometric properties of a hurricane CSE measure. *Journal of Traumatic Stress, 12*(2)*,* 379-386. https://doi.org/10.1023/A:1024792913301

Benight, C.C., Ironson, G., Klebe, K., Carver, C.S., Wynings, C., Burnett, K., Greenwood, D., Baum, A., & Schneiderman, N. (1999b). Conservation of resources and coping self-efficacy predicting distress following a natural disaster: A causal model analysis where the environment meets the mind. *Anxiety, Stress, and Coping, 12,* 107-126. https://doi.org/10.1080/10615809908248325

Benight, C.C., Shoji, K., Harwell, A., & Felix, E. (2020). Non-linear dynamic shifts in distress after wildfires: Further tests of the self-regulation shift theory. *Frontiers in Psychology, 11.* https://doi.org/10.3389/fpsyg.2020.551962

Benight, C.C., Shoji, K., James, L.E., Waldrep, E.E., Delahanty, D.L., & Cieslak, R. (2015). Trauma CSE: A context-specific self-efficacy measure for traumatic stress. *Psychological Trauma: Theory, Research, Practice, and Policy, 7*(6)*,* 591-599*.* https://doi.org/10.1037/tra0000045

Benight, C.C., Swift, E., Sanger, J., Smith, A., & Zeppelin, D. (1999c). CSE as a mediator of distress following a natural disaster. *Journal of Applied Social Psychology, 29*(12), 2443-2464.

Bhatia, K.T., Vecci, G.A., Knutson, T.R., Murakami, H., Kossin, J., Dixon, K.W., & Whitlock, K.E. (2019). Recent increases in tropical cyclone intensification rates. *Nature Communications, 10.* https://doi.org/10.1038/s41467-019-08471-z

Bistricky, S.L., Long, L.J., Lai, B.S., Gallagher, M.W., Kanenberg, H., Elkins, S.R., Harper, K.L. & Short, M.B. (2019). Surviving the storm: Avoidant coping, helping behavior, resilience and affective symptoms around a major hurricane-flood. *Journal of Affective Disorders, 257,* 297-306. https://doi.org/10.1016/j.jad.2019.07.044

Bosmans, M.G.W., Benight, C.C., van der Knapp, L.M., Winkel, F.W., & van der Velden, P.G. (2013). The associations between CSE and posttraumatic stress symptoms 10 years postdisaster: Differences between men and women. *Journal of Traumatic Stress, 26,* 184-191. https://doi.org/10.1002/jts.21789

Bosmans, M.G.W., & van der Velden, P.G. (2015). Longitudinal interplay between posttraumatic stress symptoms and CSE: A four-wave prospective study. *Social Science & Medicine, 134,* 23-29, https://doi.org/10.1016/j.socscimed. 2015.04.007

Bosmans, M. G. W., & van der Velden, P. G. (2017). Cross-lagged associations between posttraumatic stress symptoms and coping self-efficacy in long-term recovery: A four-wave comparative study. *Social Science & Medicine*, *193*, 33-40. https://doi.org/10.1016/j.socscimed.2017.09.040

Bovin, M. J., Marx, B. P., Weathers, F. W., Gallagher, M. W., Rodriguez, P., Schnurr, P. P., & Keane, T. M. (2016). Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition (PCL-5) in veterans. *Psychological Assessment, 28*(11), 1379–1391. https://doi.org/10.1037/pas0000254

Burns, R. A., Crisp, D. A., & Burns, R. B. (2020). Re-examining the reciprocal effects model of self-concept, self-efficacy, and academic achievement in a comparison of the cross-lagged panel and random-intercept cross-lagged panel model frameworks. *British Journal of Educational Psychology, 90*(1)*,* 77-91. https://doi.org/10.1111/bjep.12265

Feder, A., Mota, N., Salim, R., Rodriguez, J., Singh, R., Schaffer, J., Schechter, C.B., Cancelmo, L.M., Bromet, E.J., Katz, C.L. & Reissman, D.B. (2016). Risk, coping and PTSD symptom trajectories in World Trade Center responders. *Journal of Psychiatric Research, 82,* 68-79. https://doi.org/10.1016/j.jpsychires.2016.07.003

Glad, K. A., Jensen, T. K., Hafstad, G. S., & Dyb, G. (2016). Posttraumatic stress disorder and exposure to trauma reminders after a terrorist attack. *Journal of Trauma & Dissociation, 17*(4), 435-447. https://doi.org/10.1080/15299732.2015.1126777

Glass, K., Flory, K., Hankin, B.L., Kloos, B., & Turecki, G. (2009). Are coping strategies, social support, and hope associated with psychological distress among Hurricane Katrina survivors? *Journal of Social and Clinical Psychology, 28*(6), 779-795. https://doi.org/10.1521/jscp.2009.28.6.779

Graham, J. W. (2003). Adding missing-data-relevant variables to FIML-based structural equation models. *Structural Equation Modeling, 10*(1), 80-100. https://doi/10.1207/S15328007SEM1001_4

Hamaker, E. L. (2018). How to run the RI-CLPM with MPlus. Retrieved from http://www.statmodel.com

Hamaker, E. L., Kuiper, R. M., & Grasman, R. P. P. P. (2015). A critique of the cross-lagged panel model. *Psychological Methods, 20*(1), 102-116. https://doi.org/10.1037/a0038889

Hasselle, A.J., Schwartz, L.E., Berlin, K.S., & Howell, K.H. (2019). A latent profile analysis of coping responses to an individuals' most traumatic event: Associations with adaptive and maladaptive mental health outcomes. *Anxiety, Stress, & Coping, 32*(6), 626-640. https://doi.org/10.1080/10615806.2019.1638773

Hyre, A. D., Benight, C. C., Tynes, L. L., Rice, J., DeSalvo, K. B., & Muntner, P. (2008). Psychometric properties of the hurricane coping self-efficacy measure following Hurricane Katrina. *The Journal of Nervous and Mental Disease*, *196*(7), 562-567. https://doi.org/10.1097/NMD.0b013e31817d016c

Kaniasty, K., & Norris, F. H. (2004). Social support in the aftermath of disasters, catastrophes, and acts of terrorism: Altruistic, overwhelmed, uncertain, antagonistic, and patriotic communities. In R. J. Ursano, A. E. Norwood, & C. S. Fullerton (Eds.), *Bioterrorism: Psychological and public health interventions* (pp. 200–224). Cambridge University Press.

Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping.* New York: Springer.

Littleton, H., Axsom, D., & Grills-Taquechel, A. E. (2011). Longitudinal evaluation of the relationship between maladaptive trauma coping and distress: Examination following

the mass shooting at Virginia Tech. *Anxiety, Stress, & Coping*, *24*(3), 273-290. https://doi.org/10.1080/10615806.2010.500722

Lowe, S. R., Joshi, S., Pietrzak, R. H., Galea, S., & Cerdá, M. (2015a). Mental health and general wellness in the aftermath of Hurricane Ike. *Social Science & Medicine, 124,* 162-170. https://doi.org/10.1016/j.socscimed.2014.11.032

Lowe, S.R., Rhodes, J.E., & Waters, M.C. (2015b). Understanding resilience and other trajectories of psychological distress: A mixed-methods study of low-income mothers who survived Hurricane Katrina. *Current Psychology, 34*(3), 537-550. https://doi.org/10.1007/s12144-015-9362-6

Mulder, J. D. (2022). Power analysis for the random intercept cross-lagged panel model: Using the powRICLPM R-package. *Structural Equation Modeling: A Multidisciplinary Journal.* https://doi.org/10.1080/10705511.2022.2122467

Muthén, L. K., & Muthén, B. O. (1998-2017). *Mplus user's guide* (8th Ed.). Los Angeles: Muthén & Muthén.

Pietrzak, R.H., Tracy, M., Galea, S., Kilpatrick, D.G., Ruggiero, K.J., Hamblen, J.L., Southwick, S.M., & Norris, F.H. (2012). Resilience in the face of disaster: Prevalence and longitudinal course of mental disorders following Hurricane Ike. *PLOS One, 7*(6). https://doi.org/10.1371/journal.pone.0038964

Pooley, J. A., Cohen, L., O'Connor, M., & Taylor, M. (2013). Posttraumatic stress and posttraumatic growth and their relationship to coping and self-efficacy in Northwest Australian cyclone communities. *Psychological Trauma: Theory, Research, Practice, and Policy, 5*(4), 392–399. https://doi.org/10.1037/a0028046

Sattler, D.N., Assanangkornchai, S., Moller, A.M., Kesavatana-Dohrs, W., & Graham, J.M. (2014). Indian Ocean tsunami: Relationships among posttraumatic stress, posttraumatic growth, resource loss, and coping at 3 and 15 months. *Journal of*

Trauma & Dissociation, 15(2), 219-239. https://doi.org/10.1080/15299732.2014.869144

Snyder, C.R., & Pulvers, K.M. (2001). Dr. Seuss, the coping machine, and ‘‘Oh, the Places You’ll Go’’. In C.R. Snyder (Ed.), *Coping with stress: Effective people and processes* (pp. 3-29). Oxford: Oxford University Press.

Sprang, G., & LaJoie, A. S. (2009). Exposure, avoidance, and PTSD among Hurricane Katrina evacuees. *Traumatology, 15*(2), 10-19. https://doi.org/10.1177/1534765609331607

Tobin, D. (1995). *The Coping Strategies Inventory Short Form 32.* Unpublished manual.

Tran, B.R., & Wilson, D.J. (2022). *The local economic impact of natural disasters.* Federal Reserve Bank of San Francisco Working Paper 2020-34. https://doi.org/10.24148/wp2020-34

Wadsworth, M.E., DeCarlo Santiago, C., & Einhorn, L. (2009). Coping with displacement from Hurricane Katrina: Predictors of one-year post-traumatic stress and depression symptom trajectories. *Anxiety, Stress, & Coping, 22*(4), 413-432. https://doi.org/10.1080/10615800902855781

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). *The PTSD Checklist for DSM-5 (PCL-5).* http://www.ptsd.va.gov

Table 1

Descriptive Statistics for Study Variables

	T1 *M* (*SD*) Range Skew Kurtosis	T2 *M* (*SD*) Range Skew Kurtosis	T3 *M* (*SD*) Range Skew Kurtosis
Approach coping	46.90 (12.51) 16-80 0.21 -0.10 *n* = 258	47.80 (14.36) 16-80 0.33 -0.54 *n* = 181	47.42 (14.13) 16-80 0.39 0.01 *n* = 157
Emotional avoidance coping	17.82 (7.33) 8-36 0.54 -0.57 *n* = 259	18.69 (7.72) 8-40 0.60 -0.35 *n* = 182	19.11 (7.58) 8-40 0.45 0.38 *n* = 158
PTSS	26.52 (17.78) 0-74 0.44 0.15 *n* =258	23.58 (17.13) 0-75 0.58 -0.29 *n* = 182	23.16 (17.50) 0-73 0.59 -0.16 *n* = 157
CSE	4.19 (1.39) 1.0-7.0 0.12 -0.60 *n* = 258	4.57 (1.45) 1.0-7.0 -0.02 -0.62 *n* = 180	4.58 (1.54) 1.1-7.0 0.01 -0.91 *n* = 154

Note. M = mean; *SD* = standard deviation; PTSS = posttraumatic stress symptoms; CSE = coping self-efficacy

Table 2

Correlations Among Primary Study Variables

	2	3	4	5	6	7	8	9	10	11	12
1. T1 Approach coping	.62*	.57*	-.39*	-.39*	-.48*	.49*	.53*	.56*	.-.37*	-.35*	-.39*
2. T2 Approach coping	___	.63*	-.30*	-.34*	-.40*	.47*	.69*	.62*	-.32*	-.39*	-.39*
3. T3 Approach coping	___	___	-.30*	-.33*	-.46*	.37*	.61*	.70*	-.31*	-.39*	-.47*
4. T1 Avoidance coping	___	___	___	.66*	.63*	-.45*	-.47*	-.44*	.62*	.51*	.45*
5. T2 Avoidance coping	___	___	___	___	.77*	-.45*	-.54*	-.51*	-54*	.66*	.53*
6. T3 Avoidance coping	___	___	___	___	___	-.48*	-.58*	-.58*	58*	.67*	.68*
7. T1 CSE	___	___	___	___	___	___	.62*	.64*	-.54*	-.52*	-.57*
8. T2 CSE	___	___	___	___	___	___	___	.81*	-.56*	-.69*	-.65*
9. T3 CSE	___	___	___	___	___	___	___	___	-.57*	-.64*	-.70*
10. T1 PTSS	___	___	___	___	___	___	___	___	___	.72*	.72*
11. T2 PTSS	___	___	___	___	___	___	___	___	___	___	.76*
12. T3 PTSS	___	___	___	___	___	___	___	___	___	___	___

Note. CSE = coping self-efficacy; PTSS = posttraumatic stress symptoms.

* $p < .05$.

Table 3

Results of RI-CLPM Examining Relations Among Approach Coping, CSE, and PTSS

Model path	*b*	SE	*p*	*β*
T1 to T2 model paths				
RI Approach coping ↔ RI CSE	**7.28**	**2.34**	**.002**	**.74**
RI Approach coping ↔RI PTSS	**-62.28**	**20.01**	**.002**	**-.49**
R1 PTSS ↔ R1 CSE	**-12.80**	**2.27**	**<.001**	**-.79**
T1 Approach coping ↔ T1 CSE	1.12	2.26	.619	.15
T1 Approach coping↔ T1 PTSS	-15.39	18.69	.410	-.17
T1 PTSS ↔ T1 CSE	-0.37	1.96	.850	-.04
T2 Approach coping↔ T2 CSE	**6.22**	**1.33**	**<.001**	**.67**
T2 Approach coping ↔ T2 PTSS	-30.88	15.82	.051	-.33
T2 PTSS ↔ T2 CSE	-3.94	2.06	.056	-.50
T1 Approach coping →T2 Approach coping	**0.41**	**0.17**	**.014**	**.31**
T1 CSE→T2 CSE	-0.11	0.28	.697	-.10
T1 PTSS → T2 PTSS	0.05	0.19	.790	.06
T1 Approach coping →T2 CSE	0.03	0.02	.120	.31
T1 CSE → T2 Approach coping	1.77	1.92	.357	.13
T1 Approach coping →T2 PTSS	-0.18	0.20	.390	-.17
T1 PTSS → T2 Approach coping	-0.10	0.15	.505	-.10
T1 CSE →T2 PTSS	1.55	2.59	.551	.14
T1 PTSS → T2 CSE	-0.01	0.02	.636	-.09
T2 to T3 model paths				
T2 Approach coping ↔ T2 CSE	**6.22**	**1.33**	**<.001**	**.67**
T2 Approach coping ↔ T2 PTSS	-30.88	15.82	.051	-.33
T2 PTSS ↔ T2 CSE	-3.94	2.06	.056	-.50
T3 Approach coping ↔ T3 CSE	**3.50**	**0.77**	**<.001**	**.49**
T3 Approach coping ↔ T3 PTSS	**-28.90**	**10.05**	**.004**	**-.37**
T3 PTSS ↔ T3 CSE	**-3.15**	**0.91**	**<.001**	**-.45**
Model path	*B*	SE	*p*	β

T2 Approach coping →T3 Approach coping	0.08	0.15	.589	.09
T2 CSE→T3 CSE	0.27	0.17	.122	.25
T2 PTSS → T3 PTSS	-0.02	0.23	.923	-.02
T2 Approach coping →T3 CSE	**0.03**	**0.01**	**.018**	**.31**
T2 CSE → T3 Approach coping	**4.41**	**2.04**	**.030**	**.38**
T2 Approach coping →T3 PTSS	-0.02	0.18	.891	-.03
T2 PTSS → T3 Approach coping	-0.19	0.17	.255	-.17
T2 CSE →T3 PTSS	-4.15	2.67	.120	-.40
T2 PTSS → T3 CSE	-0.02	0.01	.154	-.18

Note. RI-CLPM = random intercept cross-lagged panel model; *b* = unstandardized slope; SE = standard error; *β* = standardized slope; CSE = coping self-efficacy; PTSS = posttraumatic stress symptoms.

Significant model paths are indicated by bold text.

Table 4

Results of RI-CLPM Examining Relations Among Emotional Avoidance Coping, CSE, and PTSS

Model path	*B*	SE	*p*	*β*
T1 to T2 model paths				
RI Avoidance coping ↔ RI CSE	**-4.14**	**1.09**	**<.001**	**-.69**
RI Avoidance coping ↔RI PTSS	**56.73**	**12.22**	**<.001**	**.77**
R1 PTSS ↔ R1 CSE	**-12.76**	**2.25**	**<.001**	**-.78**
T1 Avoidance coping ↔ T1 CSE	-0.65	1.02	.524	-.16
T1 Avoidance coping↔ T1 PTSS	**25.63**	**11.37**	**.024**	**.46**
T1 PTSS ↔ T1 CSE	-0.52	2.01	.797	-.06
T2 Avoidance coping↔ T2 CSE	-1.43	0.90	.113	-.33
T2 Avoidance coping ↔ T2 PTSS	**24.36**	**9.35**	**.009**	**.51**
T2 PTSS ↔ T2 CSE	-3.67	2.40	.126	-.48
T1 Avoidance coping →T2 Avoidance coping	0.31	0.17	.061	.29
T1 CSE→T2 CSE	-0.22	0.40	.579	-.20
T1 PTSS → T2 PTSS	0.07	0.19	.713	.08
T1 Avoidance coping →T2 CSE	-0.03	0.04	.339	-.21
T1 CSE → T2 Avoidance coping	0.03	1.29	.979	.01
T1 Avoidance coping →T2 PTSS	0.46	0.30	.126	.25
T1 PTSS → T2 Avoidance coping	0.08	0.08	.343	.15
T1 CSE →T2 PTSS	1.99	3.05	.515	.16
T1 PTSS → T2 CSE	-0.07	0.02	.778	-.07
T2 to T3 model paths				
T2 Avoidance coping ↔ T2 CSE	-1.43	0.90	.113	-.33
T2 Avoidance coping ↔ T2 PTSS	**24.36**	**9.35**	**.009**	**.51**
T2 PTSS ↔ T2 CSE	-3.67	2.40	.126	-.48
T3 Avoidance coping ↔ T3 CSE	**-0.68**	**0.34**	**.046**	**-.20**
T3 Avoidance coping ↔ T3 PTSS	**17.44**	**4.87**	**<.001**	**.48**
T3 PTSS ↔ T3 CSE	**-2.95**	**0.91**	**<.001**	**-.41**
Model path	*B*	SE	*p*	β

T2 Avoidance coping →T3 Avoidance coping	**0.34**	**0.12**	**.005**	**.37**
T2 CSE→T3 CSE	**0.45**	**0.14**	**.001**	**.42**
T2 PTSS → T3 PTSS	-0.02	0.24	.951	-.02
T2 Avoidance coping →T3 CSE	-0.03	0.02	.898	-.02
T2 CSE → T3 Avoidance coping	-0.69	0.69	.318	-.12
T2 Avoidance coping →T3 PTSS	0.15	0.32	.636	.09
T2 PTSS → T3 Avoidance coping	0.12	0.08	.102	.23
T2 CSE →T3 PTSS	-4.04	2.15	.060	-.37
T2 PTSS → T3 CSE	-0.02	0.02	.326	-.15

Note. RI-CLPM = random intercept cross-lagged panel model; *b* = unstandardized slope; SE = standard error; *β* = standardized slope; CSE = coping self-efficacy; PTSS = posttraumatic stress symptoms.

Significant model paths are indicated by bold text.