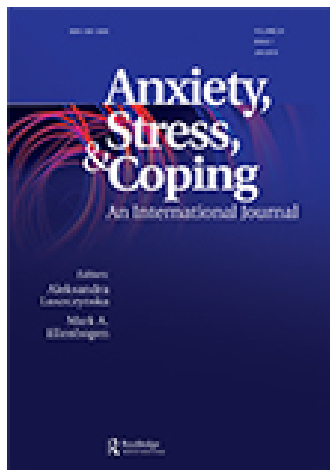


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Predicting adolescent posttraumatic stress in the aftermath of war: Differential effects of coping strategies across trauma reminder, loss reminder, and family conflict domains

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Background and Objectives: The vast majority of youth who lived through the Bosnian war were exposed to multiple traumatic events, including interpersonal violence, community destruction, and the loss of a loved one. This study examined factors that predict post-war psychological adjustment, specifically posttraumatic stress, in Bosnian adolescents. **Design:** Regression analyses evaluated theorized differential relations between three types of post-war stressors – exposure to *trauma reminders*, *loss reminders*, and *intrafamilial conflict* – specific coping strategies, and posttraumatic stress symptom dimensions. **Methods:** We examined 555 Bosnian adolescents, aged 15–19 years, to predict their long-term posttraumatic stress reactions in the aftermath of war. **Results:** Findings indicated that post-war exposure to trauma reminders, loss reminders, and family conflict, as well as engagement and disengagement coping strategies, predicted posttraumatic stress symptoms. Secondary control engagement coping responses to all three types of post-war stressors were inversely associated with posttraumatic stress symptoms, whereas primary control engagement coping responses to *family conflict* were inversely associated with hyperarousal symptoms. Disengagement responses to *trauma reminders* and *family conflict* were positively associated with re-experiencing symptoms. **Conclusions:** These findings shed light on ways in which trauma reminders, loss reminders, and family conflict may intersect with coping responses to influence adolescent postwar adjustment.

Keywords: coping; adolescent; posttraumatic stress; trauma; family; loss

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Introduction

War poses a significant global threat to the mental health and functioning of children and adolescents. Although it is difficult to determine the psychological toll on the millions of child survivors of war, the United Nations (UN) estimated that 10 million children were traumatized by war during the 1990s (UN, 2000). In recent years, international and governmental relief organizations have demonstrated a growing interest in responding to this threat by providing psychosocial services to war-affected youth (e.g., Layne et al., 2008; Qouta, Palosaari, Diab, & Punamäki, 2012). Survivors of war in childhood have been the focus of increasing attention and concern during the past two decades, based on mounting evidence regarding the adverse effects of war exposure (including exposure to death, injury, life threat, and intense suffering of others) on a broad array of developmentally salient outcomes (e.g., Allwood, Bell-Dolan, & Husain, 2002; Layne et al., 2010; UNICEF, 1999), including elevated prevalence rates of posttraumatic stress disorder (PTSD), depression, and anxiety (e.g., Feldman & Vengrober, 2011; Hasanovic, 2011; Papageorgiou et al., 2000).

One such armed conflict with devastating effects on youth was the violent fragmentation of the former Yugoslavia, including the 1992–1995 Bosnian Civil War, characterized by the direct targeting of civilians in ethnic cleansing and genocidal campaigns, prolonged sieges, and the massive destruction of the country's infrastructure. Nearly 100,000 people are estimated to have been killed during the Bosnian War, with over 2 million people displaced. The war set the stage for a protracted postwar ecology in which families have been forced to contend with persisting political instability, high unemployment, and severe economic strain up to the present day (see European Commission, 2012). Studies of Bosnian children and adolescents exposed to the war report elevated rates of posttraumatic stress reactions, anxiety, and depressive symptoms (e.g., Allwood et al., 2002; Hasanovic, 2011; Papageorgiou et al., 2000). Of particular interest, Smith, Perrin, Yule, Hacam, and Stuvland (2002) and Smith, Perrin, Yule, and Rabe-Hesketh (2001) found elevated rates of posttraumatic stress and maladaptive grief in war-exposed Bosnian youth, whereas symptoms of anxiety and depression fell within normal ranges, suggesting that posttraumatic stress may be of particular concern in this population and may be especially susceptible to postwar stressors endemic to the region. Commonly reported postwar stressors include persistent reminders of war-related traumatic incidents; reminders of the losses of friends, family, and homes; domestic conflict (Layne et al., 2006); and ongoing separations from loved ones, many of whom were permanently resettled following refugee flight (Layne, Warren, et al., 2009). Given the multitude of postwar stressors and the high rates of psychological distress in this population, this study explored possible differential links between postwar stressors, coping strategies, and posttraumatic stress in adolescents who had lived through the Bosnian War. To our knowledge, this study is the first to explore the various ways in which these candidate causal risk factors may intersect to influence child and adolescent postwar adjustment, with special emphasis given to posttraumatic stress reactions (see Layne, Warren, Watson, & Shalev, 2007, Layne et al., 2009). The resulting findings carry the potential to not only improve efforts to identify youth living in the aftermath of war-related conflict who are at high risk for psychopathology, but also to identify promising intervention foci for programs that serve war-exposed youth (Layne, Steinberg, & Steinberg, *in press*).

Postwar reminders and secondary stressors

In reviewing theorized predictors of posttraumatic adjustment, Layne et al. (2006) proposed that three types of stressors – *trauma reminders*, *loss reminders*, and *secondary adversities*

such as intrafamilial conflict – may each play a role in influencing whether posttraumatic stress reactions will initially develop, as well as subsequently recede, persist, worsen, or fluctuate over time. In a seminal series of papers applying a developmental psychopathology framework to the childhood traumatic stress field, Pynoos (1996) and Pynoos, Steinberg, and Wraith (1995) proposed that the links between traumatic events and subsequent psychological adjustment are influenced by a complex matrix of proximal and distal child-intrinsic and extrinsic factors. These factors include frequency and degree of exposure to trauma reminders, secondary adversities, family adjustment, and the use of adaptive versus maladaptive coping strategies. As applied to a postwar environment, the model suggests that both *trauma reminders* (i.e., cues, including people, places, situations, sounds, smells, or objects that evoke memories associated with past traumatic experiences) and *loss reminders* (i.e., cues, including encountering the person's name, belongings, or places the deceased used to inhabit that direct attention to his or her ongoing absence from one's life) are among the most proximal and recurrent stressors that youth are likely to experience (Layne et al., 2006). *Family conflict* and interfamilial violence are also potent secondary stressors often associated with exposure to armed conflict (Dubow et al., 2012; Qouta, Punamäki, & Sarraj, 2005). Indeed, families exposed to war often experience increased rates of family conflict, verbal and physical abuse, isolation, disruption in family roles, and lessened feelings of support and safety (Feldman & Vengrober, 2011; Qouta et al., 2005).

Coping as a multifaceted entity

Compas, Connor-Smith, Saltzman, Thomsen, and Wadsworth (2001) define coping as “conscious, volitional efforts to regulate emotion, thought, behavior, physiology, and the environment in response to stressful events or circumstances.” The authors propose a multifaceted conception of coping, in which the effectiveness of a given coping strategy is evaluated within the context of the focal stressor domain (e.g., family conflict) in which it is employed. Facets of coping proposed by Compas and his colleagues include engagement with the stressor or one's emotion (*engagement coping*), as well as disengagement from the stressor or the emotion (*disengagement coping*, including avoidance, denial, and wishful thinking). Engagement coping is further partitioned into responses intended to exert direct influence over the stressor and one's reactions to it (*primary control engagement coping*, including emotional expression, problem-solving, and emotional regulation) versus responses that involve attempts to adapt to the stressor (*secondary control engagement coping*, including acceptance, cognitive restructuring, distraction, and positive thinking).

Support for the Compas et al. (2001) model of coping in adolescence is found in several confirmatory factor analytic studies with Euro-American adolescents (Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000; Wadsworth & Compas, 2002), Navajo American adolescents (Wadsworth, Rieckmann-James, Benson, & Compas, 2004), and with the present sample of war-exposed Bosnian youth (Benson et al., 2011). Studies using this coping model have also found that refugee children in postwar environments rely on fewer and less effective coping strategies (Kocijan-Hercigonja, Rijavec, Marusić, & Hercigonja, 1998), and that disengagement coping (e.g., avoidance) in the face of chronic stress is positively associated with prolonged affective distress and poor health outcomes (Primo et al., 2000). The general child and adolescent coping literature also demonstrates that both *primary* and *secondary control* coping strategies are linked to lower levels of distress (e.g., Connor-Smith et al., 2000), and *disengagement* strategies, such as avoidance

or emotional suppression, are associated with increased symptoms of anxiety, depression, PTSD, and suicide risk (Kaplow, Dodge, Amaya-Jackson, & Saxe, 2005; Kaplow, Gipson, Horwitz, Burch, & King, 2013; Shapiro, Kaplow, Dodge, & Amaya-Jackson, 2012).

Coping with chronic postwar stressors: The case for trauma reminders and loss reminders

Many wartime and postwar psychosocial services focus explicitly on coping to promote resilient functioning and positive adaptation, based on the widely held assumption that coping is an influential mediator or moderator of links between war trauma, postwar adversities, and postwar psychosocial adjustment (e.g., Benson et al., 2011; Durakovic-Belko, Kulenovic, & Dapic, 2003). Although studies of Bosnian youth report a positive correlation between the frequency of exposure to war-related traumatic events and psychological problems (Allwood et al., 2002; Durakovic-Belko et al., 2003; Papageorgiou et al., 2000; Smith et al., 2002), the ways in which different coping strategies intersect with specific types of stressors and thereby promote or impede adjustment are not well understood (Smith et al., 2001). Identifying how trauma and loss reminders influence adolescent postwar adjustment can shed light on ways in which war-related events and their aftermath affect stress response systems (Compas, Connor, Osowiecki, & Welch, 1997) and contribute to short- and long-term health and well-being.

Coping with family conflict

Evidence from studies of non-war exposed youth also suggests that coping strategies are associated with family conflict and adolescent adjustment (Langrock, Compas, Keller, Merchant, & Copeland, 2002). In particular, although several studies suggest that *secondary control* strategies are more effective in coping with the relatively uncontrollable stress often associated with family conflict (e.g., O'Brien, Bahadur, Gee, Balto, & Erber, 1997), some evidence also suggests that both *primary* and *secondary control* coping strategies (Wadsworth & Berger, 2006; Wadsworth & Compas, 2002) appear to mediate the link between family stress (e.g., marital conflict and economic strain) and adolescent psychological adjustment. In contrast, studies of the links between *disengagement* coping responses and family conflict report divergent findings. In particular, some studies report that disengagement strategies (e.g., avoidance) are associated with better adjustment (O'Brien et al., 1997), whereas other studies report an inverse association between avoidance and psychological adjustment (Herman & McHale, 1993). Further, Wadsworth and Compas (2002) differentiated between *distraction* (a form of secondary control engagement) and *avoidance* (a form of disengagement) and found no significant direct relation between disengagement coping and symptoms of psychological distress. However, under conditions involving high levels of economic strain and high levels of family conflict, adolescents were more likely to rely on disengagement coping strategies – a finding that may reflect adolescents' diminished set of coping skills or resources to manage their stress (Wadsworth & Compas, 2002). Although aspects of coping with family conflict have been examined in a variety of non-war exposed populations, to date, no studies have been carried out with families contending with the aftermath of a devastating armed conflict. Such research will provide valuable information on the unique coping strategies adolescents use in settings that they perceive to be beyond their control.

Purpose of the current study

Notwithstanding the growing evidence linking coping to postwar adjustment, no published study has, to our knowledge, concurrently examined the roles of *trauma reminders*, *loss reminders*, and *family conflict* in either of two contexts: (1) By testing their role as candidate links between war trauma and various dimensions of posttraumatic stress and (2) By seeking to clarify ways in which these three types of postwar stressors may intersect with various *coping strategies* to influence adolescent posttraumatic stress reactions. Accordingly, this study examines factors hypothesized to predict posttraumatic stress symptoms in a sample of war-exposed Bosnian adolescents, with a focus on exploring potentially differential relations between specific war-related stressors, specific coping strategies, and posttraumatic stress dimensions.

We formulated two primary a-priori hypotheses. First, that exposure to the stressor domains of *trauma reminders*, *loss reminders*, and *family conflict* would each be positively associated with adolescent posttraumatic stress symptoms in the long-term aftermath of war. Second, that different coping responses would be differentially associated with posttraumatic stress symptoms. In particular, we predicted that *primary* and *secondary control* strategies would be inversely associated with posttraumatic stress symptoms across each of the three stressor domains. In contrast, we predicted that *disengagement* coping strategies would be positively associated with posttraumatic stress symptoms across all stressor domains.

Method

Participants

Participants included 555 secondary school students aged 15–19 years ($M = 16.9$, $SD = 1.1$), 49% female, attending two secondary schools in Sarajevo, Bosnia. As reported by school counselors (RK and HP), students were generally of middle- to lower-socioeconomic status relative to prevailing Bosnian postwar social conditions – specifically, the students typically came from families whose lack of money, political influence, and social ties outside the region made it difficult to flee the country before or during the war. Thus, compared to their same-age peers throughout Bosnia and Hercegovina, participating students were probably *more* likely to have been exposed either to the brutal (1992–1995) siege of Sarajevo or to expulsion, loss, and internal displacement due to ethnic cleansing. Ninety-seven percent of the participants identified their ethnicity as Bosnian Muslim, given that most families of other ethnic backgrounds fled the city before or during the war.

Participants were drawn from an ongoing longitudinal study ($N = 985$) and were included if they completed the Responses to Stress Questionnaire (RSQ) and the UCLA PTSD Reaction Index-Revised (PTSD-RI). Each participant completed one of three versions of the RSQ (trauma reminder, loss reminder, or family conflict, described below) and was assigned to one of three mutually exclusive subgroups: *Trauma reminders* ($n = 134$, aged 15–19, $M = 17.0$, $SD = 1.1$, 56.3% female); *Loss reminders* ($n = 118$, aged 15–19, $M = 16.9$, $SD = 1.1$, 47.5% female); and *Family conflict* ($n = 303$, aged 15–20, $M = 16.9$, $SD = 1.0$, 46.2% female).

Measures

Responses to Stress Questionnaire (RSQ)

We used the RSQ (Connor-Smith et al., 2000) to measure adolescents' exposure to one of three focal types of postwar stressors and the adolescents' associated voluntary coping

responses. The RSQ is adapted for specific domains of stress by presenting respondents with a list of stressors within a given domain (e.g., family conflict) followed by an inventory of voluntary coping and involuntary stress responses in relation to those stressors. Respondents chose one of three RSQ versions to complete (trauma reminders, loss reminders, or family conflict) by selecting which of the three stressors was “the most serious source of stress” they faced during the past six months and rating the frequency with which they encountered that type of stressor on a 4-point scale ranging from 0 (Never) to 3 (Almost every day). Students also rated how much the stressors reminded them of the war, how stressful they were, and how much control they believed they had over the stressors. Students then used a 4-point scale ranging from 1 (not at all) to 4 (very much) to rate the extent to which each item described how they coped with the stressors when they occurred.

In a previous study using the same data-set (Benson et al., 2011), confirmatory factor analyses supported a five-factor structure for the RSQ. The factors consisted of *Primary Control Engagement Coping* (problem-solving, emotional expression, and emotional modulation), *Secondary Control Engagement Coping* (acceptance, distraction, positive thinking, and cognitive restructuring), *Disengagement Coping* (avoidance, denial, and wishful thinking), *Involuntary Engagement* (e.g., intrusive thoughts, rumination, emotional and physiological arousal), and *Involuntary Disengagement* (e.g., emotional numbing, cognitive interference, and escape). These findings thus replicated the factor structure, internal consistency, and criterion-referenced validity of the RSQ in a Bosnian youth sample as compared to prior studies with other populations (e.g., Connor-Smith et al., 2000). We chose to focus exclusively on evaluating *voluntary* coping strategies (e.g., primary control engagement coping, secondary control engagement coping, and disengagement coping, as measured by the first three factors) for two primary reasons. First, voluntary coping strategies hold relevance for designing intervention programs that target influential “modifiable” mediators – a primary aim of the longitudinal study (see Layne et al., 2007, 2008). Second, eliminating *Involuntary Engagement* and *Involuntary Disengagement* (as measured by the latter two factors) from the pool of candidate predictors reduced the risk for predictor–criterion contamination and thereby enhanced study rigor. Specifically, we removed predictors (e.g., intrusive thoughts, physiological arousal, and emotional numbing) that conceptually overlap with the criterion variable (posttraumatic stress symptoms).

The study design employed three different versions of the RSQ, which were forward- and backward-translated by Bosnian natives (see Benson et al., 2011). The *RSQ-Trauma Reminders version* (RSQ-TR) measured students’ exposure to reminders of war-related trauma and their coping responses to those reminders. The first section of the RSQ-TR consists of 12 items measuring frequency of exposure to war-related trauma reminders. A preliminary exploratory factor analysis using maximum likelihood extraction with oblique rotation (results available upon request) of the trauma reminders revealed two distinct and interpretable factors. We named these factors *Sensory-based Reminders* (e.g., “touching something or being touched by something that reminds me of terrible things that happened”), and *General War-Related Reminders* (e.g., “seeing destroyed or damaged buildings, bridges, or streets”). Sensory-based reminders reflect youth’s perceptions of the frequency, as well as cooccurrence of, a complex mixture of stressful life events, including circumstances from which the youth could either not escape (war-related restrictions on travel) or could likely escape only through marked avoidance (avoiding being around

family, friends, and neighbors). The inescapable nature of such reminders may increase the risk for stress-related pathology and disruptions in close interpersonal relationships. The second section of the RSQ-TR contains 57 items measuring voluntary coping and involuntary stress responses to the trauma reminders listed in the first section (e.g., “When I am reminded of something terrible that happened, I let someone know how I feel”). Removing the items measuring involuntary responses, as previously explained, thus resulted in 30 total coping items. Item stems for the 30 coping items were identical across all three RSQ versions with the exception of wording modifications to orient participants to the specific stressor domain (e.g. “I think about happy things to take my mind off *the reminder* or how I’m feeling”; “When we have *family problems*, I try not to feel anything”).

The RSQ-Loss Reminders (RSQ-LR) measured students’ exposure to loss reminders and their responses to those reminders. The first section of the RSQ-LR contains 11 items measuring frequency of perceived exposure to various loss reminders (e.g. “hearing his or her name”); the second section contains 57 items measuring coping and involuntary responses, described previously. Again, the 27 involuntary stress responses were removed, producing 30 total coping items that were then analyzed. Similarly, the RSQ-Family Conflict (RSQ-FC) measured students’ exposure to family conflict and their responses to it. The first section of the RSQ-FC contains 12 items measuring students’ perceived frequency of exposure to family stress and conflict. A preliminary exploratory factor analysis using maximum likelihood extraction with oblique rotation (results available upon request) of the family conflict variables revealed three interpretable factors. We named these *Family Conflict* (e.g., “Members of my nuclear family fought with each other”), *Parental Intrusiveness* (e.g., “My parents were too nosy about my personal life”), and *Family Burdens* (e.g., “I had to take on too much responsibility in my family”). The experience of such family burdens for adolescents may reflect discomfort with family roles and explicit or implicit lack of agreement among family members regarding the obligations and the expectations for the adolescent in the family system. The second section of the RSQ-FC contains 57 items measuring coping and involuntary responses, which were reduced to 30 total coping items for analysis, as previously described.

UCLA PTSD Reaction Index-Revised (PTSD-RI)

The PTSD-RI (Steinberg, Brymer, Decker, & Pynoos, 2004) is a self-report scale measuring the frequency of posttraumatic stress symptoms experienced during the previous month. The Bosnian version of the PTSD-RI contains 17 items corresponding to the 17 DSM-IV PTSD diagnostic criteria (e.g., “I have upsetting thoughts or pictures of what happened come into my mind when I do not want them to”). Items are measured on a 5-point scale ranging from 0 (Never) to 4 (Almost Always). The total scale has demonstrated adequate internal consistency ($\alpha = .87$), test-retest reliability ($r = .75$), and construct validity in relation to a range of distress measures (r 's = .30 to .70) among postwar Bosnian adolescents sampled in 2001 (Layne et al., 2009). We scored the PTSD-RI following Armour et al.'s (2011) four-factor solution (comprised of reexperiencing, hyperarousal, avoidance, and numbing, as well as a Total score), given that it was developed locally with Bosnian adolescents and more closely aligned with (four-dimensional) DSM-5 PTSD criteria, thereby improving the generalizability of the results to future studies.

Procedure

Participants were drawn from a longitudinal study of long-term postwar adaptation conducted between fall 1999 and spring 2001. Data collection methods included detailed self-report questionnaires. As part of the ongoing longitudinal study, trained school counselors (HP and RK) made formal presentations to their respective school councils. After gaining verbal support from the school councils, the counselors used school records to select highly war-exposed classrooms at their respective schools. The counselors then made presentations in the parent meetings of these selected classrooms and obtained signed caregiver consent. Students' informed assent was obtained via a letter on the first page of the questionnaire. No students, parents, or teachers who were invited to participate declined. Participating students, caregivers, and teachers received monetary compensation. These materials and procedures received university IRB approval. Participants completed both the RSQ and UCLA PTSD Reaction Index-Revised in fall 2000, five years following the formal cessation of hostilities in the 1992–1995 Bosnian Conflict.

Data analytic plan

We examined predictors of five criterion variables, including (1) adolescent's PTSD-RI posttraumatic stress symptom total scale score, as well as (2) *reexperiencing*, (3) *hyperarousal*, (4) *avoidance*, and (5) *numbing* subscale scores (examined separately), with simultaneous-entry linear regression models using SPSS version 20.0. We created separate models for each of the three subsamples (trauma reminder, loss reminder, and family conflict). The three subsamples, crossed with the five criterion variables, produced 15 total regression models. Predictor variables for each model consisted of *secondary stressors* (i.e., trauma reminders, loss reminders, or family conflict stressors) and *coping variables* (i.e., primary control engagement coping, secondary control engagement coping, and disengagement coping). Given the substantial overlap between avoidance and numbing symptoms of posttraumatic stress and disengagement coping behaviors (e. g., avoidance and denial), only primary control and secondary control engagement coping were included in models predicting the avoidance and numbing subscales. All of the coping variables were included in models predicting the remaining posttraumatic stress subscales (i.e., reexperiencing, hyperarousal, and total scale).

Results

Descriptive statistics

A validity check revealed that 100% of participants reported exposure to one or more types of war-related traumatic events. See [Table 1](#) for demographics and total-sample PTSD scores.

Multiple regression analyses: Coping with trauma reminders, loss reminders, and family conflict as predictors of posttraumatic stress symptoms

Coping with postwar trauma reminders

[Table 2](#) presents results of the five linear regression models used for each of the three subsamples. The trauma reminder subsample produced a significant first model that accounted for 28% of the variance in posttraumatic stress total scores, $F(5, 120) = 9.25$,

Table 1. Descriptive statistics for demographics and posttraumatic stress scores.

| Sample | <i>N</i> | Age | UCLA PTSD | UCLA PTSD | UCLA PTSD | UCLA PTSD | UCLA PTSD |
|---------------------------|----------|------------|---------------------|---------------------------------|-------------------------------|----------------------------|------------------------------------|
| | | (years) | Total <i>M</i> (SD) | Reexperiencing <i>M</i> (SD) | Hyperarousal <i>M</i> (SD) | Avoidance <i>M</i> (SD) | UCLA PTSD Numbing <i>M</i> (SD) |
| Full sample | 555 | 16.9 (1.1) | 12.8 (10.7) | 3.3 (3.4) | 4.8 (3.7) | 2.0 (2.0) | 2.7 (3.3) |
| Trauma reminder subsample | 134 | 17.0 (1.1) | 15.2 (11.1) | 4.0 (3.6) | 5.5 (3.7) | 2.5 (2.2) | 3.1 (3.3) |
| Loss reminder subsample | 118 | 16.9 (1.1) | 15.5 (10.8) | 4.3 (3.5) | 5.4 (3.7) | 2.5 (2.1) | 3.3 (3.3) |
| Family conflict subsample | 303 | 16.9 (1.0) | 11.3 (10.0) | 2.8 (3.1) | 4.4 (3.6) | 1.6 (1.8) | 2.4 (3.1) |

Table 2. Significant predictors in each regression model for trauma reminders, loss reminders, and family conflict subsamples.

| Dependent variable | Self-identified subsamples | | |
|----------------------------|--|---|--|
| | Trauma reminders | Loss reminders | Family conflict |
| Posttraumatic stress total | Sensory-based trauma reminders: $\beta = .42^{***}$ | Loss reminders factor: $\beta = .28^{**}$ | Family burdens factor: $\beta = .16^*$ |
| Reexperiencing | Sensory-based trauma reminders: $\beta = .36^{**}$ | Disengagement coping: $\beta = .34^{**}$ | Disengagement coping: $\beta = .27^{**}$ |
| | Secondary control engagement coping: $\beta = -.26^*$ | Loss reminders factor: $\beta = .37^{***}$ | Family burdens factor: $\beta = .17^*$ |
| Hyperarousal | | Disengagement coping: $\beta = .28^*$ | Disengagement coping: $\beta = .24^{**}$ |
| Avoidance | Sensory-based trauma reminders: $\beta = .27^*$ | Loss reminders factor: $\beta = .28^{**}$ | Family burdens factor: $\beta = .14^*$ |
| | | Secondary control engagement coping: $\beta = -.24^*$ | Primary control engagement coping: $\beta = -.23^{**}$ |
| Numbing | Sensory-based trauma reminders: $\beta = .43^{**}$ | Loss reminders factor: $\beta = .26^*$ | Family conflicts factor: $\beta = .16^*$ |
| | | | Secondary control engagement coping: $\beta = -.16^*$ |
| | | | Family conflicts factor: $\beta = .18^{**}$ |
| | | | Family burdens factor: $\beta = .14^*$ |

* $p < .05$, ** $p < .01$, *** $p < .001$.

$p < .001$. In this model, sensory-based trauma reminders contributed significantly to the prediction of variance in adolescent's total posttraumatic stress scores ($\beta = .42$; $p < .001$); however, no coping strategy reached significance ($p > .05$). Similarly, only sensory-based trauma reminders emerged as a significant predictor of hyperarousal scores in a second model, accounting for 22% of the variance ($\beta = .39$; $p = .001$); coping strategies again did not reach significance ($p > .05$). In contrast, in a third model predicting reexperiencing symptom scores, sensory-based trauma reminders ($\beta = .36$; $p = .002$) and secondary control engagement coping ($\beta = -.26$; $p = .039$) both emerged as significant predictors, such that higher secondary control engagement coping was associated with lower reexperiencing symptoms. This third model accounted for 29% of the variance $F(5, 122) = 10.12$, $p < .001$. A fourth model predicting avoidance scores also reached significance $F(4, 122) = 4.36$, $p < .001$, accounting for 13% of the variance. Sensory-based trauma reminders were the only significant predictor ($\beta = .27$; $p = .026$), such that greater frequency of exposure to sensory-based trauma reminders was associated with greater avoidance. Last, a fifth model predicting numbing scores also reached significance, $F(4, 123) = 5.89$, $p < .001$, accounting for 16% of the variance. Only sensory-based trauma reminders reached significance as a predictor ($\beta = .43$; $p < .001$).

Coping with postwar loss reminders

The loss reminder subsample produced a significant first model that accounted for 29% of the variance in PTSD-RI total scale scores $F(4, 105) = 10.58$, $p < .001$. Both loss reminders ($\beta = .28$; $p = .004$) and disengagement coping ($\beta = .34$; $p = .004$) emerged as significant contributors to the variance in adolescent's total posttraumatic stress scores. A second model predicting reexperiencing symptoms produced similar results, reaching significance $F(4, 105) = 13.19$, $p < .001$ and accounting for 33% of the variance. The loss reminders factor ($\beta = .37$; $p < .001$) and disengagement coping ($\beta = .28$; $p = .012$) both served as significant and positive predictors of students' reexperiencing scores, such that greater reported exposure to loss reminders and greater use of disengagement coping were each positively associated with reexperiencing symptoms. A third and fourth model predicting hyperarousal and numbing scores both reached significance, accounting for 21% and 9% of the variance in the criterion variables, respectively. Only loss reminders made a significant predictive contribution ($\beta = .28$; $p = .006$ for hyperarousal symptoms, and $\beta = .26$; $p = .014$ for numbing symptoms). Finally, a fifth model predicting avoidance also reached significance $F(3, 106) = 6.65$, $p < .001$, accounting for 16% of the variance. Notably, only secondary control engagement coping emerged as the significant predictor ($\beta = -.24$; $p = .025$), such that greater use of secondary control engagement coping was associated with fewer avoidance symptoms.

Coping with postwar family conflict

The family conflict subsample produced a significant first model that accounted for 19% of the variance in posttraumatic stress total symptom scores, $F(6, 257) = 9.89$, $p < .001$. Both family burdens ($\beta = .16$; $p = .013$) and disengagement coping ($\beta = .27$; $p = .001$) reached significance as positive predictors of adolescents' total posttraumatic stress scores. A second model predicting reexperiencing symptoms produced similar results, in that family burdens ($\beta = .17$; $p = .012$) and disengagement coping ($\beta = .24$; $p = .004$)

were the only significant predictors. A third model predicting hyperarousal scores also reached significance, accounting for 18% of the variance $F(6, 265) = 9.95, p < .001$. The family burdens factor made a significant predictive contribution ($\beta = .14; p = .033$), as did primary control engagement coping ($\beta = -.23; p = .002$), the latter showing an inverse association. A fourth model predicting numbing symptoms also reached significance, $F(5, 264) = 6.14, p < .001$, accounting for 10% of the variance. Notably, only family conflict ($\beta = .18; p = .007$) and family burdens ($\beta = .14; p = .038$) reached significance. A fifth model predicting avoidance scores also reached significance, $F(5, 268) = 5.30, p < .001$, accounting for 9% of the variance. Family conflict ($\beta = .16; p = .016$) and secondary control engagement coping ($\beta = -.16; p = .032$) reached significance, such that *more* reported family conflict and *less* use of secondary control engagement coping were each associated with higher avoidance symptoms.

Discussion

To our knowledge, this study is the first to examine concurrently the theorized roles of postwar trauma reminders, loss reminders, and family conflict as candidate predictors (theorized secondary stressors) of the links between war exposure (a theorized primary stressor) and long-term postwar psychological adjustment as measured by posttraumatic stress symptoms. Notably, a large proportion of outcomes were significantly predicted not only by the focal secondary stressor, but also by coping strategies including primary control, secondary control, and disengagement. Our results revealed two sets of differential relations. These included (1) differential relations between the three types of postwar stressors (as predictors) and posttraumatic stress symptoms (as criterion variables); and (2) differential relations between different coping strategies and a number of the same criterion variables. Taken together, these results suggest that not only postwar stressors (trauma reminders, loss reminders and family conflict) but also the ways in which adolescents deliberately respond to them, may play an influential role in contributing to long-term posttraumatic stress.

Coping with trauma reminders following war exposure

It is noteworthy that of the wide range of trauma reminders assessed, sensory-based trauma reminders, in particular, predicted hyperarousal, avoidance, reexperiencing, and numbing symptoms, whereas general war-related reminders did not significantly predict posttraumatic stress symptoms in any stressor domain. This finding points to the apparent potency of trauma reminders associated with immediate sensory experiences, such as smell, sight, touch, and kinesthetic bodily sensations, which may be most evocative when linked to adolescents' family, friends, and neighbors. We theorize that general war-related trauma reminders (e.g., destroyed buildings and restrictions on travel) tend to diminish in their presence and potency over time as cities are rebuilt, news coverage switches in focus to other topics, and political tensions recede to some extent. In contrast, sensory experiences, because they are more transportable, may thus be more likely to form part of adolescents' "war baggage" that they carry with them and that shapes their proximal postwar ecologies, regardless of where they live or migrate. For example, an adolescent may smell smoke or hear a siren and be reminded of horrific experiences during the war, despite being far away from the actual locations where those events occurred.

Coping with loss reminders following war exposure

Loss reminders also exerted significant predictive effects, with such reminders as *participating in activities that the deceased person used to do* and *seeing other people that look like the deceased person* predicting all posttraumatic stress symptom dimensions except avoidance. Nevertheless, the lack of significant association between loss reminders and avoidance symptoms, although somewhat surprising, may highlight the importance of coping strategies in managing avoidance symptoms in particular. Specifically, both *secondary control engagement* coping and *disengagement* coping related in differential ways to various domains of posttraumatic stress symptoms in the loss reminder subsample. As hypothesized, disengagement strategies such as *avoidance*, *denial*, and *unrealistic wishful thinking* were associated with higher reexperiencing posttraumatic stress symptoms. In contrast, secondary control engagement coping strategies in the loss reminders subsample were only associated with the avoidance domain, such that strategies such as *cognitive restructuring* and *positive thinking* were inversely associated with avoidance symptoms. These results are consistent with findings of other studies that avoidance or emotional suppression is associated with heightened intrusive thoughts and psychological distress (Compas et al., 1997; Kaplow et al., 2005, 2013; Primo et al., 2000).

Coping with family conflict following war exposure

It is notable that *family burdens* are the dimension of family conflict most strongly linked to adolescents' posttraumatic stress symptoms in the aftermath of war. Elements of family burdens include *taking on a large amount of responsibility in the family* and *worrying excessively about meeting the needs of the family*. This finding may reflect the unique developmental tasks and challenges of adolescence (perhaps especially for adolescents growing up in a stressful postwar ecology), who simultaneously strive for and value their independence, desire closeness and care from family members, and feel a sense of obligation to help their family. Adolescents who report feeling burdened by their family responsibilities thus appear to be at greatest risk for experiencing difficulty in managing posttraumatic stress symptoms in a postwar climate. This is consistent with a *cumulative risk* perspective, in that the accumulation of stressors following a traumatic event can put youth at even greater risk for the development of psychopathology, particularly posttraumatic stress (Edwards, Holden, Anda, & Felitti, 2003). This finding is also consistent with the concept of a *risk factor caravan*, defined as a constellation of cooccurring factors that accumulate and "travel" with their host across development (Layne et al., 2009).

Disengagement and secondary control engagement coping strategies were again prominent predictors of posttraumatic stress in the family conflict subgroup; however, primary control engagement coping also exerted a significant predictive effect, suggesting that all three coping strategies may be influential in relation to adolescent's mental health. Similar to findings from the loss reminders subgroup, *disengagement* coping was positively associated with reexperiencing symptoms; in contrast, *secondary control engagement* coping was inversely associated with avoidance symptoms – a finding consistent with those of studies with US adolescents coping with family stress (e.g., Wadsworth & Compas, 2002).

Implications for intervention development

Although five years had elapsed between the war and data collection, youth were still struggling with major postwar secondary adversities. Our findings thus emphasize the need for intervention efforts to more systematically address ongoing stressors contributing to long-term adolescent postwar adjustment. Elements may include risk screening for trauma reminders (specifically sensory reminders), loss reminders, and family conflict and burdens.

If replicated using research designs that support causal inference, these findings can also help to furnish the evidence base needed to develop *assessment-driven, component-based interventions* that strategically target the primary causal precursors of high-priority clinical outcomes. Studies of the determinants of posttraumatic adjustment can play a valuable role in identifying *evidence-based intervention foci*, including *influential mediators* and *modifiable moderators* (Layne et al., 2007). The resulting knowledge base can guide the development of interventions that strategically target these “evidence-based foci” as *intervention objectives* by prescribing *practice elements* that carry the best evidence for effectively preventing, interrupting, and/or attenuating key causal risk factors, mediators, and moderators, as well as enhancing promotive factors (Layne et al., 2014).

For example, the finding that *sensory-based trauma reminders*, including those related to interpersonal experiences, may serve as a potentially influential predictor of postwar distress points to the value of skills-based training interventions that help youth and families recognize ways in which they act as trauma and loss reminders for one another and to respond with empathy and support (Saltzman et al., 2011). It is notable that of the various posttraumatic stress symptom domains examined within the trauma reminders subsample, only *reexperiencing symptoms* were associated with coping, such that greater use of *secondary control engagement strategies* (including *distraction, cognitive restructuring, and positive thinking*) when confronting trauma reminders was associated with lower reexperiencing symptoms. This finding provides preliminary empirical support for such intervention objectives as helping clients learn to distract themselves from exposure to trauma reminders, restructure maladaptive thoughts about trauma reminders, and focus on positive aspects of one’s experience while reframing negative attributions (i.e., meaning-making). Our findings are also consistent with those of treatment outcome studies regarding the effectiveness of trauma- and grief-informed interventions whose components include training clients in cognitive restructuring or reappraisal skills to cope with trauma reminders (e.g., Layne et al., 2008).

In addition, our finding that secondary control engagement coping strategies were inversely linked with avoidance in the loss reminders subsample carries promise for the treatment of avoidance symptoms in bereaved youth. For example, trauma and grief component therapy (Layne, Saltzman, Kaplow, & Pynoos, 2013) incorporates such “reframing”-based practice elements (a form of secondary control engagement coping) as helping clients to reminisce, memorialize, and cherish positive aspects of the deceased person, while also releasing and letting go of upsetting memories of the deceased.

Building an ecologically informed knowledge base will furnish intervention developers and clinicians with the empirical justification and theoretical rationale needed to expand beyond targeting *symptom reduction* as the primary therapeutic objective by focusing on a broader matrix of key contributors to posttraumatic adjustment (e.g., trauma reminders that evoke estrangements, family conflict and coping, social support; Layne

et al., 2008). Intervention development must also take into consideration the cultural salience of these constructs. It is likely that the experience of such stressors as family conflict and family burdens varies significantly as a function of culture, given the varying levels of responsibility and expectation placed on adolescents across different parts of the world. For example, the developmental timing of a shift toward independence or the acceptable roles an adolescent may take on in the family system (including the perception of these roles as being “stressful”) may be influenced by factors in the larger culture, including gender roles and intergenerational expectations. We encourage treatment providers seeking to address issues of family conflict and role burden to proceed cautiously and to frame interventions using an appropriate cultural lens.

Limitations and future directions

Limitations of this study include (1) reliance on a single informant and (2) use of a cross-sectional design, which precludes causal inference and prevents the rigorous examination of prewar vulnerabilities or stressors in this population. Other limitations include (3) adolescent self-sorting into mutually exclusive groups rather than completing all three versions of the RSQ so as to obtain a more comprehensive picture of how adolescents’ coping strategies and posttraumatic stress symptom levels may differ as a function of stressor domain. Indeed, youths’ perceptions of which type of stressor is most stressful may fluctuate across developmental periods and may be linked to specific developmental transitions. In addition, (4) although we employed a widely used measure of posttraumatic stress symptoms, other psychological distress measures (e.g., grief) are not reported here. Last, (5) these findings may have limited generalizability to other traumatized populations (e.g., youth bereaved by military losses and interpersonal violence victims).

Although this study design precludes causal inference, these findings are consistent with the assertion that the variables under study, including three types of postwar stressors (trauma reminders, loss reminders, and family conflict), the four dimensions of posttraumatic stress symptoms (reexperiencing, avoidance, hyperarousal, and numbing), and the three dimensions of coping (primary control engagement coping, secondary control engagement coping, and disengagement) are meaningfully distinct entities (Layne, Olsen, Kaplow, Shapiro, & Pynoos, 2011). These findings are thus relevant to the current debate surrounding the factor structure and dimensionality of PTSD as a diagnostic entity (e.g., Elhai et al., 2013). Studying these differential relations can help to build theory by clarifying pathways that play an influential role in maintaining, exacerbating, or attenuating postwar distress (Layne et al., 2006, 2010). Future research that takes a longitudinal perspective will provide much-needed clarity on causal pathways between stressors, coping, and psychological adjustment. While highly challenging in a war-ravaged setting, future longitudinal studies may allow for comparisons between prewar vulnerabilities and postwar stressors and coping strategies.

Given that verifying the presence of covariation among variables is a necessary prerequisite for establishing causality, a main contribution of this study is the identification of “likely suspect” causal candidates (e.g., trauma reminders, loss reminders, and coping strategies) for inclusion in future prospective longitudinal studies of trajectories of adolescent posttraumatic adaptation. Stress and coping may also be studied as candidate pre–post intervention outcome variables, mechanisms of therapeutic change, or as mediators of psychosocial adaptation.

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