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Psychological Distress in Young Adults Exposed to War-Related Trauma in Childhood

Maria M. Llabre¹, Fawzyiah Hadi², Annette M. La Greca¹, and Betty S. Lai³

¹Department of Psychology, University of Miami, Coral Gables, FL

²Department of Educational Psychology, Kuwait University, Kuwait

³School of Public Health, Georgia State University, Atlanta, GA

Abstract

Objective—We tested a conceptual model of the effect of war-trauma exposure in childhood on psychological distress in young adulthood.

Method—Participants included 151 urban Kuwaiti children (51% female; *M* age = 10.62 years) exposed to the 1990-1991 Gulf crisis (assessed in 1993); participants also included 140 parents (81% female; *M* age mothers = 36.50 years; *M* age fathers = 41 years). In 2003, 120 participants were reassessed as young adults (50% female; *M* age = 21.19 years).

Results—The conceptual model was evaluated with structural equations. War-trauma exposure was associated with psychological distress in children and parents, but parents reported larger effects than children. Parents' psychological distress did not contribute to children's psychological distress. Children's psychological distress did not dissipate over time. Social support may function as a potential mediator of the effect of war-trauma exposure on psychological distress.

Conclusions—Findings support the importance of early detection and treatment of children exposed to war-trauma. Findings also implicate social support as a factor to consider in clinical interventions for children exposed to war-trauma.

Keywords

War; children; posttraumatic stress; mental health

Exposure to traumatic events is common in childhood. While prevalence rates vary widely across studies, estimates from the National Comorbidity Survey Replication (2012), based on a representative sample of 5,692 U.S. children under the age of 13, suggest that as many as 39% experience some type of trauma. Worldwide childhood exposure to war trauma is also common. A 2002 report estimated over 2 million children were killed in wars in the preceding decade, and many more had witnessed or been victims of violence accompanying wars (Bellamy, 2004). Traumatic exposures in childhood have mental health consequences in adulthood. For example, the Adverse Childhood Events study has documented a dose-

response relationship between adverse childhood experiences and adult mental health (Chapman et al., 2004).

Despite the importance of understanding childhood trauma, the developmental trajectory of trauma reactions from childhood to adulthood is complex, and psychosocial influences are not well understood. Evidence from longitudinal studies is scant, partly because of the difficulty in collecting the necessary data. We identified only four studies that included controls and followed disaster-exposed children into adulthood (Bolton, O’Ryan, Udwin, Boyle, & Yule, 2000; Green et al., 1994; McFarlane & Van Hooff, 2009; Morgan, Scourfield, Williams, Jasper, & Lewis, 2003; Yule et al., 2000). Further, although several studies document the psychological consequences of war exposure on children (Elbedour, 1998; Zeidner, 2005), we were unable to locate any study that tracked children into adulthood and assessed the role of *psychosocial factors* in the long-term psychological consequences of war exposure. The current study addressed this gap by tracking into young adulthood children who were exposed to the Gulf crisis in 1990-1991.

Model of Exposure to War-Trauma

Using a conceptual model of risk, proposed in 1990 (Green et al., 1991; Korol, 1990), and modified by La Greca and colleagues (La Greca, Silverman, Vernberg, & Prinstein, 1996; La Greca, Silverman, Lai, & Jaccard, 2010; Vernberg, La Greca, Silverman, & Prinstein, 1996), we examined risk and protective factors that may explain children’s long-term reactions to trauma. In this conceptual model of risk, exposure to traumatic events predicts the development of psychological distress among children. Children’s initial psychological distress symptoms predict their later psychological distress symptoms, and this relationship is mediated by the presence of intervening life events. Further, in this conceptual model, stressors and intervening life events disrupt children’s social support, which further influences the presence of persistent distress symptoms.

We extended this conceptual model by examining these relationships over a much longer period of time (12 years post trauma) than has previously been examined. For example, this conceptual model has been applied to longitudinal studies, but children were followed over much shorter periods of time (e.g., 10 months post trauma in La Greca et al., 1996; 15 months post trauma in Lai, La Greca, & Llabre, in press; 21 months post trauma in La Greca et al., 2010). Given the time frame of the current study, this was a unique opportunity to significantly extend and expand our conceptualization of factors linking trauma exposure and psychological distress. We also broadened the conceptual model to include parental distress and perceived stress, based on current findings in the literature. The model tested in this study is depicted in Figure 1. Below we discuss key aspects of this model: exposure to trauma, initial distress, and psychosocial characteristics of the post-trauma environment, including levels of parental distress, intervening life events, youths’ perceived social support, and youths’ perceived stress.

Exposure

The specific trauma examined was the 1990-1991 Gulf crisis, which began with Iraq’s invasion of Kuwait in August 1990 and ended in February 1991. During the occupation,

many Kuwaiti families were exposed to potentially traumatic events, including deaths, disappearances, and arrests of family members.

In line with the conceptual model, we expected war-trauma exposure to be positively associated with children's psychological distress two years after the Gulf crisis (1993). The impact of the Gulf crisis on Kuwaiti children's psychological functioning is well documented (Hadi & Llabre, 1998; Hadi, Llabre, & Spitzer, 2006; Nader et al., 1993). Effects varied across the Kuwaiti population, primarily as a function of exposure severity. Long-term effects on posttraumatic stress (PTS), depressive symptoms, and to some extent, anxiety, have been linked to experiences of children's fathers during the Gulf crisis, with children whose fathers were arrested reporting the highest levels of PTS symptoms, when compared to children whose fathers were missing or killed (Hadi et al., 2006).

Initial Distress

Further, in line with the conceptual model, we expected proximal psychological distress levels (in 1993) after trauma exposure to predict distal psychological distress (in 2003), and we expected proximal distress to serve as a potential mediator of the effects of exposure on distal distress (Pynoos, Steinberg, & Piacentini, 1999). Exposure to severe violence and terrorism may have long-lasting psychological consequences (Dyregrov, Gjestad, & Raundalen, 2002; Rozensky, Sloan, Schwarz, & Kowalski, 1993). In addition, children with persistent symptoms after trauma are those who initially report the highest distress (Kuterovac-Jagodic, 2003). Children's elevated PTS symptoms after traumatic events are associated with PTS years later (Jensen, Dyb, & Nygaard, 2009). Also, adolescent psychological distress may mediate the long-term effect of exposure on adult distress (Pynoos et al., 1999).

Parental Distress

We extended the conceptual model to include parental distress symptoms as a predictor of children's psychological distress. Specifically, we hypothesized that parental psychological distress symptoms may serve as a potential mediator of the relationship between war trauma exposure and child psychological distress symptoms. Parents provide the main source of support for children, and parental psychological distress may influence children's post-trauma distress reactions. Parental psychological distress has been associated with higher levels of PTS symptoms in youth (Cohen, Berliner, & Mannarino, 2000; Green et al., 1991). It has been suggested (Kinston & Rosser, 1974) that children's reaction to traumatic events may be more strongly influenced by parent's reaction than by the event itself.

Life Events

Further, in line with the conceptual model, life events were expected to be positively associated with young adult psychological distress and to potentially mediate the relationship between war-trauma exposure and young adults' psychological distress. Life events can increase as a result of trauma exposure, but can also have an additive effect beyond that of trauma exposure (La Greca et al., 2010). Children encountering potentially stressful major life events (e.g., death/hospitalization of a family member; parental divorce) after disasters are at high-risk for chronic and severe PTS reactions (La Greca et al., 2010;

Silverman & La Greca, 2002; Stuber et al., 1997). While life events are not viewed as a direct consequence of the focal exposure, some may be indirectly linked to exposure (La Greca et al., 1996). With respect to war-trauma, psychological or physical injury resulting from war-trauma exposure could result in the occurrence of life events years later.

Social Support

We modified the conceptual model to examine social support in young adulthood as a potential mediator of the relationship between prior life events and young adult psychological distress. Past research with the conceptual model has identified social support as a predictor of lower distress (La Greca et al., 1996, 2010), and evidence supports social support as both a buffer of the relationship between exposure and PTS symptoms (Joseph, Yule, Williams, & Andrews, 1993; La Greca et al., 2010; Llabre & Hadi, 1997), as well as a mediator of the relationship between life events and children's PTS symptoms (La Greca et al., 2010).

In our model we have conceptualized social support as a mediator of the relationship between war-trauma exposure and PTS symptoms. Although social support may be protective immediately after trauma exposure (Kuterovac-Jagodic, 2003; Llabre & Hadi, 1997), social support may not play the same role over prolonged periods of time. Notably, past research identifying social support as a buffer, or moderating variable, focused on periods of time much closer to the traumatic event (e.g., one year post traumatic event in Joseph et al., 1993; 21 months post trauma in La Greca et al., 2010); in comparison, our study examined psychological distress symptoms 12 years after traumatic events. In addition, wars may adversely affect support networks, rendering social support (or lack of it) a risk factor for children's distress. Over time, trauma exposed individuals may have increased support needs, while resources diminish and support networks may weaken. In addition, life events may interfere with social support availability (La Greca et al., 2010), reducing the protective effects of social support, and decreased support over time may result in increased distress levels. Thus, over time, social support might function as a mediator of the effect of trauma on psychological distress. To our knowledge, this question has not yet been examined in any study following trauma-exposed children into young adulthood.

Perceived Stress

We extended the conceptual model to include perceived stress, which has not previously been examined. The original conceptual model did not include measures of perceived stress, because the model was developed to understand *children's* reactions to traumatic events. As noted by Grant and colleagues (2003, p. 448), it is not appropriate to ask children about *perceived* stress, because definitions of stress that include "cognitive appraisal processes is problematic for research on children and adolescents."

As our study followed children into *young adulthood*, we deemed it appropriate and important to include young adults' perceptions of stress. In addition, because of the ongoing Iraq war during data collection in 2003, participants were confronted with trauma reminders. To indirectly capture those reminders, we included perceived stress as a proxy for trauma reminders.

Perceived stress was expected to potentially mediate the effect of war trauma exposure and life events on psychological distress. Life events are positively associated with perceived stress (Barnes, Davis, & Treiber, 2007; Kingston, Heaman, Fell, Dzakpasu, & Chalmers, 2012), and in turn, perceived stress is positively associated with psychological distress symptoms (Early, Cushway, & Cassidy, 2006; Skirka, 2000). We also expected perceived stress to add to the cumulative effect of exposure on psychological distress, by requiring greater social support.

Summary

In summary, the present study is a 10-year follow-up of Kuwaiti children who were initially assessed following the 1991-1993 Gulf Crisis, and who exhibited varying levels of exposure to the war, as evidenced by having a father who was killed, missing, or arrested during the war. A control group of Kuwaiti youth whose parents were neither killed, missing, nor arrested were also included. These children were re-evaluated as young adults, using a conceptual model that has been useful in prior child disaster research. This model was extended to include and examine the potential mediating roles of parental distress, social support, and young adult perceived stress.

Method

Participants

Participants were assessed in 1993, two years after the Gulf crisis (Time 1), and in 2003 (Time 2). At Time 1, 151 children (51% female; M age=10.62 years) participated (previously described in Llabre & Hadi, 1997). The sample included four war-exposure groups of urban children whose: 1) fathers had been killed ($n=40$); 2) fathers were missing at Time 1 ($n=39$); 3) fathers were arrested but returned home ($n=33$); and, as a comparison group, 4) family members were neither killed, missing, nor arrested ($n=39$). Of 160 eligible families, nine parents (6%) did not consent. Child inclusion criteria were: Kuwaiti citizen, aged 9-12 years, and exposure to the 1990-1991 Gulf crisis.

In 1993, lists of potential participants for Groups 1 – 3 were obtained from the Martyr's Office in Kuwait, the Kuwait National Committee for Missing and Prisoners of War, and The Kuwait Association for Defending War Victims, respectively. We identified participants for our control group, Group 4, by contacting local schools for lists of similarly aged peers.

We assessed 140 parents (113 mothers, M age=36.5 years; 27 fathers, M age=41 years) at Time 1. Inclusion criteria comprised being a child participant's biological parent. Only mothers participated for child Groups 1-2 (as their fathers were killed or missing). For the other groups, either parent participated.

At Time 2, we reassessed 120 (80%) child participants, now young adults (19–24 years old; previously described in Llabre & Hadi, 2009). At Time 2, 31 participants were missing data: 2 died, 9 were out of the country, 10 refused, and 10 could not be located. Participants with Time 2 data ($n=120$) were similar to those without ($n=31$) with respect to: war-trauma

exposure, $t(149) = -.34$, ns ; PTS symptoms $t(149) = .41$, ns ; depression $t(149) = -.43$, ns ; anxiety $t(149) = .56$, ns ; and distribution across the four war-exposure groups $\chi^2(3) = 3.56$, ns .

Procedures

As noted above and previously described (Llabre & Hadi, 1997, 2009), Time 1 participants were recruited through local schools or government-sponsored organizations, to identify children with varying war-trauma exposure. Each source provided lists of potential participants, from which a stratified random sample of boys and girls was selected. Parents provided informed consent; psychologists assessed those who agreed to participate at children's schools. At Time 2, families were re-contacted by telephone; when participants agreed to participate, assessments were conducted at participants' homes or the Principal Investigator's (FH'S) office.

Measures

At Time 1, children were administered a crisis interview and measures of PTS, depression, and anxiety. Parents were administered measures of PTS, depression, and anxiety. At Time 2, young adults were administered measures of PTS, depression, anxiety, life events, perceived stress, and social support. Measures were translated into Arabic using back translation.

Exposure to war-related trauma—The *Crisis Structured Interview* (CSI) (Llabre & Hadi, 1994) assessed war-related trauma exposure during the Gulf crisis. The 16 items (yes/no) asked what happened to participants, family members, and friends (e.g., "Were you hurt by the Iraqis?", "Do you have a relative who was arrested by the Iraqis?"). Items also asked whether children witnessed any war-related violence in person, on television, or in pictures (e.g., "Did you witness the Iraqis killing someone?", "Did you see any injured or dead people from the Gulf Crisis on television?"). Items were summed to yield a total score. The CSI has been used in past research with children exposed to war-related trauma (Llabre & Hadi, 1994, 1997).

PTS symptoms—The *Posttraumatic Stress Disorder Symptom Scale* (PTSDS), adapted from the Davidson Self-Rating Post Traumatic Stress Disorder Scale (Davidson, Smith, & Kudler, 1989), assessed 17 PTS symptoms (e.g., "Have you had distressed dreams of the crisis?", "Have you been upset by something which reminded you of the crisis?"). Items were rated 0=*none* to 4=*everyday*, and were based on DSM-III-R criteria (American Psychiatric Association, 1987). Participants rated symptoms in relation to Gulf crisis exposure. The PTSDS has been used with youth and adults exposed to war-trauma, demonstrating adequate internal consistency (.80 to .90 in Hadi et al., 2006). This measure was used at both Time 1 and Time 2. In the current study, internal consistency was acceptable (Time 1: children = .80, parents = .90; Time 2: young adults = .85).

Depressive symptoms—The *Children's Depression Inventory* (CDI; Kovacs & Beck, 1977) assessed children's depressive symptoms at Time 1. The CDI consists of 27-items that are presented in three graded statements (e.g., "I am sad once in a while," "I am sad many

times,” “I am sad all the time”); items were rated 0-2. The CDI has been used in past research with children exposed to traumatic stressors, and demonstrated adequate internal consistency in those studies (.61-.91 in Karakaya et al., 2006). Internal consistency for children in this study was .78.

The *Beck Depression Inventory* (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) measured depressive symptoms for parents (Time 1) and young adults (Time 2). The BDI is a 21-item measure with graded statements (“I do not feel sad,” “I feel sad or blue,” “I am blue or sad all the time and I can’t snap out of it,” “I am so sad or unhappy that I can’t stand it”), which are rated 0-3. The BDI has been used in past research with adults exposed to war-traumas (Mghir & Raskin, 1999), and has demonstrated adequate internal consistency (.84 in Llabre & Hadi, 1997). The last item, which queried about sex, was excluded due to cultural concerns from the IRB. Internal consistency for this sample was .86 for parents and .79 for young adults.

Anxiety symptoms—The *Revised Children’s Manifest Anxiety Scale* (RCMAS; Reynolds & Richmond, 1992), a 37-item (yes/no) measure, assessed children’s (Time 1) anxiety symptoms (e.g., “I have trouble making up my mind,” “I get nervous when things do not go the right way.”). The RCMAS has been used in past research with children exposed to traumatic stressors (La Greca, Silverman, & Wasserstein, 1998). Internal consistency was .86 for children in this study.

Parents (Time 1) completed the *Symptom Checklist-90-Revised* (SCL-90-R; Derogatis, 1983) anxiety subscale (e.g., “Worried about sloppiness or carelessness,” “worrying too much about things”). Items were rated on a five-point scale (0=no problem at all to 4=extremely). The SCL-90-R measure has been used in past research of youth and adults exposed to war-traumas (Elbedour, 1998; Laor et al., 2001), demonstrating good internal consistency (.95-.96 in Elbedour, 1998). Internal consistency was .80 among parents in this study.

Young adult (Time 2) anxiety symptoms were measured with the *Trait Anxiety Scale* (Spielberger & Sydeman, 1994). This is a 20-item instrument (e.g., “I am tense,” “I am worried”); items were rated on a four-point scale (1=almost never, to 4=almost always). The Trait Anxiety Scale has been used in past research with adults exposed to traumatic events (Amir, Stafford, Freshman, & Foa, 1998). Internal consistency was .81 for young adults in this sample.

Life events—At Time 2, an 11-item measure based on the *Life Events Checklist* (LEC; Johnson & McCutcheon, 1980) assessed potentially stressful, objective life events (e.g., personal loss, extended separations, break-ups). Young adults indicated whether events occurred between 1993-2003. The LEC has been used in past research with youth exposed to traumatic stressors (La Greca et al., 1996, 2010).

Perceived stress—At Time 2, the *Perceived Stress Scale* (PSS; Cohen, Kamarck, & Mermelstein, 1983) assessed the degree to which young adults perceived situations during the past three months as stressful (e.g., “In the last month, how often have you been upset

because of something that happened unexpectedly?”). This 14-item measure (rated 0=never to 4=very often), has been used in past research with adults exposed to traumatic stressors, demonstrating adequate internal consistency (.68 to .73 in Samuels-Dennis, Ford-Gilboe, Wilk, Avison, & Ray, 2010). Internal consistency was .84 for young adults in this sample.

Social support—The *Interpersonal Support Evaluation List* (ISEL; Cohen, Mermelstein, Kamarck, & Hoberman, 1985) assessed young adults’ (Time 2) perceived social support and social resources. The ISEL contains 40-items (e.g., “There are several people that I trust to help solve my problems”), rated as probably true or false. The ISEL has been used in past research with adults exposed traumatic stressors (Norris & Kaniasty, 1996). Internal consistency was .81 in this study for young adults.

Results

Preliminary Analyses

We examined variable distributions and means. Variable distributions approximated normality. Descriptive statistics are presented in Table 1. Further, we refer readers to Llabre & Hadi, 1997, where we reported frequencies of children’s exposure to war-related trauma.

It is difficult to compare the current study means to other samples because no normative data exist for translated Arabic measures. Nevertheless, mean PTSDS scores of children and parents fell well below a clinical cutoff of 40, which has been used to examine diagnostic accuracy of the PTSDS with the Structured Clinical Interview for the DSM-III-R (Davidson et al., 1997). In the current study, 3 children (2%), 27 parents (19%), and 7 young adults (1%) reported PTSDS scores that fell above these cutoffs. In comparison to other samples, children’s rates of clinically significant levels of PTS symptoms in this study were comparable to rates found in other samples of trauma exposed children (e.g., 4% of Kuwaiti 8 – 12 year old children after the Gulf Crisis in Hadi & Llabre, 1998; 4.5% of Israeli adolescents, grades 7-9, exposed to terrorist attacks in Laufer & Solomon, 2008). Rates of clinically significant levels of PTS symptoms were comparable for parents, but lower for young adults in this study, when compared to rates found in other studies (e.g., 19.8% of war-exposed adults in Balkan countries met criteria for PTSD in Morina et al., 2013).

As an additional method for interpreting means for PTS symptoms in this study, we examined PTSDS scores within our sample, as this measure was administered to children and parents (Time 1), and to young adults (Time 2). At Time 1, parents’ PTS levels were higher than children’s, $t(137), 8.10, p < .001$. Children’s PTS increased across time, $t(119), 4.09, p < .001$, but young adult PTS levels (Time 2) were not as high as parents’ initial levels $t(107) = -4.13, p < .001$.

Mean depressive scores for children and adults in our sample also fell below clinical cutoffs (a cutoff of 19 on the CDI has been used in past research, Cole, Peeke, Martin, Truglio, & Seroczynski, 1998; a clinical cutoff of 19 for moderate depression has been used for the BDI in past research; Beck, Steer, & Garbin, 1988). In this sample, 7 children (5%), 10 parents (7%), and 38 young adults (27%) reported depressive symptoms that fell above these cutoffs. We compared parent and young adult reports on the BDI. Parents’ depression levels

(Time 1; $M = 9.3$, $SD = 4.7$) were lower than their children's levels as young adults (Time 2, $M = 15.7$, $SD = 8.4$), $t(110)$, -7.97 , $p < .001$. In comparison to other samples, children's rates of clinically significant depression were lower than those found among other studies of trauma exposed children (e.g., 9.6% of children assessed two months after the 1999 Earthquake in Turkey in Vehid, 2006; 13.9% of children reporting probable depression 15 months after the Sichuan Earthquake in Jia, 2010; 18% of children assessed 15 months after Hurricane Ike in Lai, La Greca, Auslander, & Short, 2013). Rates of clinically significant depression were lower for parents, but higher for young adults in this study, when compared to rates reported in other samples (e.g., 13.2% of mothers after the Bosnian war in Smith, Perrin, Yule, & Rabe-Hesketh, 2001; 19.7% of war-exposed adults in Balkan countries in Morina et al., 2013).

Gender comparisons were performed on all variables. No gender differences were observed, with the exception of young adult females ($M = 18.6$) reporting greater perceived stress at Time 2, $t(118) = 2.40$, $p = .02$ than young adult males ($M = 16.1$).

Table 2 displays correlations among measures. War-trauma exposure was significantly correlated with all variables, except for life events ($r = .13$, ns). Life events did not correlate significantly with Time 1 measures, but was significantly correlated with all Time 2 measures.

Correlations among psychological distress measures (PTS, depression, and anxiety) support the strategy of combining them into latent variables for children and parents at Time 1 (r 's ranged from .45-.67 and .65-.75, respectively) and for young adults at Time 2 (r 's ranged from .55-.69). Social support was strongly associated with Time 2 measures, and moderately related with Time 1 child measures. Correlations between child and parent measures were not consistently significant at either time point. Perceived stress was strongly correlated with distress measures at Time 2. Thus, although the PSS was chosen because it purportedly measures perceived stress, in our sample the PSS appeared to function more as a measure of distress.

Structural Equation Modeling to Evaluate the Conceptual Model

Structural equation modeling (Mplus version 6; Muthen & Muthen, 1998 – 2005) was utilized to evaluate our proposed conceptual model. Potential mediation effects were examined by utilizing tests of indirect effects.

First, we evaluated measurement models from our proposed conceptual model for the latent variables of child, parent, and young adult psychological distress. These measurement models fit the data according to four criteria (nonsignificant χ^2 ; $CFI > .95$; $RMSEA < .06$; and $SRMR < .10$; Bentler, 2007; Hu & Bentler, 1999), [$\chi^2(24) = 36.37$, $p = .051$; $CFI = .98$; $RMSEA = .06$; 90% CI : .00 - .10; $SRMR = .06$; $AIC = 7453.10$].

Next, we evaluated the proposed conceptual model (Figure 1). The model did not have optimal fit to the data, [$\chi^2(58) = 86.36$, $p = .01$; $CFI = .96$; $RMSEA = .06$; 90% CI : .03 - .08; $SRMR = .13$; $AIC = 9889.33$]. Thus, we considered two alterations to the proposed conceptual model.

In the first alternative model, we added a path linking children's Time 1 psychological distress to Time 2 social support, because of associations between social support and children's Time 1 measures. This model improved fit to the data [$\chi^2(57)=75.36$, $p=.052$; $CFI=.98$; $RMSEA=.05$, 90% CI : .000, .072; $SRMR=.11$; $AIC=9880.33$].

In the second alternative model, we specified Time 2 perceived stress as another indicator of Time 2 psychological distress (see Figure 2). We considered this change because the only significant indirect effect implicating perceived stress as a potential mediator was the link between life events and Time 2 psychological distress [$estimate=.61$; $SE=.30$; $z=2.01$, $p=.05$]. Also, because perceived stress was measured concurrently with the three measures of distress, all four variables were highly intercorrelated. This alternative model fit the data according to all indices [$\chi^2(59)=73.84$, $p=.09$; $CFI=.98$; $RMSEA=.04$, 90% CI : .000, .07; $SRMR=.08$; $AIC=9874.81$].

We then evaluated which of these two alternative models to retain. These models were not nested, so they could not be compared directly. However, the AIC index favors the latter, which we retained for interpretation (Figure 2; Table 3). All loadings in the latent variables were significant ($p < .001$); standardized coefficients ranged from .61- .89.

Results of our final model (Figure 2) indicate that war-trauma exposure was significantly associated across time with children's and parents' psychological distress two years later. However, contrary to expectations, parents' psychological distress was not significantly associated with children's distress, once exposure was controlled. Accordingly, the hypothesized mediating effect of parents' distress in the effect of war-related exposure on children's psychological distress was not confirmed [$estimate=.12$; $SE=.09$; $z=1.44$, $p>.05$].

Also, against expectations, war-trauma exposure did not influence the number of life events occurring between Times 1 and 2. However, life events were associated with young adults' (lower) social support and (greater) psychological distress, but did not appear to mediate the effect of war-trauma exposure on psychological distress.

Social support played an important role as a potential mediator in the link between psychological distress in childhood and young adulthood. When testing the effect of childhood distress on young adult distress we did not find a significant direct effect; however, we found a significant indirect effect via social support [$estimate=.36$, $SE=.10$, $z=3.50$, $p=.01$]. Also, the significant indirect effect of war-trauma exposure on young adults' psychological distress was potentially mediated by childhood distress and subsequently by social support [$estimate=.35$, $SE=.12$, $z=3.00$, $p=.01$]. The revised conceptual model explained 60% of variance in young adults' psychological distress, 21% of the variance in social support, 26% of the variance in children's distress, and 12% of the variance in parents' distress.

Two additional alterations to the model were considered, with social support as a moderating variable, but the added paths were nonsignificant and resulted in poor-fitting models. First, we added an interaction between childhood psychological distress and social support, to evaluate whether social support acted as a moderator of relationship between childhood distress and young adult distress. Next, we added an interaction between war-

trauma exposure and social support. As these models were considered, but discarded, the results are not reported here.

Discussion

The physical devastation associated with wars is widely recognized. We are learning more about the psychological consequences of wars, especially to the many civilians, including countless numbers of children, exposed to wars. Our knowledge about psychological consequences primarily relates to immediate effects. However, the long-term consequences of war are important to understand, as consequences may be felt many years post-war, when children reach adulthood. This study provided a unique opportunity to evaluate the long-term impact of war-trauma exposure by following children 12 years after the 1990–1991 Gulf Crisis.

Key findings from the study are listed here and discussed below. War-trauma exposure appeared to confer psychological effects on parents and their children, with parents reporting larger effects than their children. However, parents' distress did not add to children's distress beyond what resulted from common war-exposure. Psychological distress tracked from childhood into adulthood in complex ways, and did not dissipate over time. In the presence of ongoing war reminders (the Iraq war took place during our 2003 data collection), symptoms may flare even a decade after exposure. Social support played an important role in young adults' psychological distress. Consistent with recent findings regarding children exposed to a natural disaster (La Greca et al., 2010), our findings suggest that social support may decay with the occurrence of other life events. Also consistent with prior prospective disaster research (La Greca et al., 1996; 2010), we found that social support was associated with lower levels of psychological distress. In this role, social support may function as a potential main effect as well as a mediator of the effect of war-trauma exposure on psychological distress.

The relationship between war-trauma *exposure* and children's psychological distress in this sample has been previously reported (Llabre & Hadi, 1997). Our findings are consistent with research on the effects of war on children (Barenbaum, Ruchkin, & Schwab-Stone, 2004).

We extended previous child-trauma research by specifying *parental distress* as a potential mediator of this relationship. Unexpectedly, our results did not support this hypothesis, in contrast with other studies conducted after traumatic events (Cohen et al., 2000). However, previous studies examining the role of parental psychological distress do not always control for shared trauma exposure (e.g., Qouta, Punamäki, & Sarraj, 2003). Controlling for shared trauma experience is important for helping to elucidate the unique influence of parental distress on child distress, over and above the effects of trauma exposure on children's psychological distress. Our sample size was modest ($n = 140$ parents), thus we may not have had sufficient power to detect a small effect (Cohen, 1992). However, the fact that this effect was small is surprising. One possible explanation is that our children were 9–12 years old when first tested. Studies with stronger findings for the parents' roles have examined younger children, under the age of five (Laor et al., 1997), and have used parents as informants for their children's symptoms (e.g., de Vries, Soetekouw, Van Deer Meer, &

Bleijenberg, 1999; Qouta, Punamäki, & Sarraj, 2005). This is a major methodological flaw, as parents are poor reporters of their children's internalized distress symptoms (Mesman & Koot, 2000). Another factor may be that Kuwaiti families generally live in extended clusters, and thus children have additional adults, besides their parents, to provide support. Future studies examining parents' roles would benefit from separating direct from indirect effects by controlling for exposure common to parents and children.

Results provide insight into relationships between trauma exposure and proximal and distal *psychological distress*. We assessed psychological distress at time points proximal (1993) and distal (2003) to the event. Proximal distress measures were specified as potential mediators of exposure on distal distress (Pynoos et al., 1999). However, our models required the additional specification of a path from childhood distress to social support in young adulthood. When this path was specified, the nature of the indirect effect became clear: childhood distress predicted less subsequent *social support*, which in turn was associated with increased levels of distress in young adulthood. Thus, between proximal and distal measures of psychological distress lies the potential mediating role of social support. Our longitudinal design allowed us to examine how the role of social support changes over time.

An important factor to the maintenance of PTS and related psychopathology is *exposure to multiple traumatic events* over time (McFarlane & Van Hooff, 2009; La Greca et al., 2010). Consistent with this notion, our data confirmed a direct effect from life events to young adults' psychological distress. Further, similar to findings from the child disaster literature (e.g., La Greca et al., 2010), we found that over time, life events may interfere with the availability of social support, thereby reducing the protective effects of social support.

Contrary to expectations, *life events* did not mediate the relationship between war-trauma exposure and young adult psychological distress. The link between war exposure and life events may have been attenuated in our study for several reasons: Kuwait is a wealthy country, institutions were functioning soon after the crisis, and the government compensated citizens for many war-incurred material losses. Thus, our findings may not generalize to other wars or disasters where the aftermath is associated with additional stressors.

Trauma reminders with trauma-specific features, whether proximal or distal, are thought to contribute to renewed PTS and anxiety (Pynoos et al., 1999). Because of ongoing war in Iraq during our 2003 data collection, participants were likely confronted with reminders of their trauma. We attempted to capture this by measuring current perceived stress, initially proposed to add to the cumulative effect of war-trauma exposure and to potentially mediate the effect of life events. This hypothesis did not receive a fair test in our model. Perceived stress provided better fit as an indicator of distress than as an independent variable, due to strong associations with concurrently measured psychological distress symptoms. Future studies should measure trauma reminders with more direct assessments. Also, while our design was longitudinal, measures of social support, perceived stress, and the three measures of psychological distress were collected concurrently in 2003, limiting our ability to make a strong case for the direction of their effects.

To our knowledge, this is the first study to track children exposed to war-trauma over ten years into young adulthood. Despite its uniqueness, this study has several limitations. First, we did not diagnose children for PTSD; however, it is common in this literature to use measures assessing PTS symptoms. Second, the sample size was modest and there was some attrition; however, given the 10-year period of time between the waves of data collection, 20% attrition was substantially better than expected. Nevertheless, the small sample may have contributed to our inability to detect some effects, particularly interactions. Third, we did not have information about children's symptoms experienced prior to war exposure, nor were we able to collect more than two time points of data, limiting our ability to establish strict temporal precedence. Unfortunately, this is common in the literature examining children's exposure to traumatic stressors (e.g., Lai et al., 2013; Mghir & Raskin, 1999; Zeidner, 2005), due to the unpredictable nature of these types of stressors. Nevertheless, future studies that collect this information prospectively would be informative. Fourth, the post-war environment in Kuwait was, in some respects, unique, limiting our ability to generalize to other war scenarios. War scenarios differ in multiple dimensions, and it is important to characterize the nature of the exposure, as well as the post-war environment, to better understand generalizability of research findings. Finally, we did not assess children immediately after the end of the conflict. Thus, our results do not speak to immediate effects.

Our findings have several important implications. Researchers must carefully consider the time frame when evaluating social support and reactions to traumatic events, as we found that social support may initially buffer distress reactions (Llabre & Hadi, 1997), but over time, distress may erode social support. Potential mechanisms for how distress may influence social support may include ruminative coping styles (Abela, Vanderbilt, & Rochon, 2004) or interpersonal behaviors such as excessive reassurance seeking (Stice, Ragan, & Randall, 2004). Important intervention strategies may include focusing on replacing ruminative responses with problem solving or distraction or focusing on interpersonal behaviors and skills (e.g., Interpersonal Psychotherapy for Adolescents; Mufson, Dorta, Moreau, & Weissman, 2004).

Our findings related to social support also have important clinical implications. Interventions for trauma-exposed youth should evaluate social support over time, as the nature of social support may erode in the presence of distress and other life stressors; efforts to bolster social support in trauma-exposed youth may be an important treatment goal. Social support must also be understood and assessed in a cultural context. Culturally sensitive interventions should involve support networks. Since war experiences are shared, this also suggests the clinical treatment of families, not individuals.

In conclusion, our data support the importance of early detection and treatment of children experiencing psychological distress after war exposure, as this may prevent problems in adulthood. Further, life events contributed to persistent stress, through the erosion of social support, and also directly. Clinicians should focus on efforts to help youth manage stressors effectively, either via social support or with other strategies. Furthermore, our results suggest the possibility of re-experiencing symptoms in the presence of impending conflict.

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Figure 1.

Proposed model of the long-term effects of trauma in childhood.

Note. PTS=Posttraumatic Stress. DEP=Depressive Symptoms. ANX=Anxious Symptoms.

Figure 2.

Final model of the long-term effects of trauma in childhood

Note. PTS=Posttraumatic Stress. DEP=Depressive Symptoms. ANX=Anxious Symptoms.

Solid lines indicate significant paths.

Table 1

Means and standard deviations for study variables.

Measures from 1993	<i>M</i>	<i>SD</i>	Range
<i>Children (n=151)</i>			
Exposure (CSI)	7.0	2.6	1–14
Posttraumatic Stress (PTSDS-C)	12.4	9.6	0–46
Depression (CDI)	8.7	5.0	0–24
Anxiety (RCMAS)	9.5	5.9	0–25
<i>Parents (n=140)</i>			
Posttraumatic Stress (PTSDS-P)	23.5	15.1	0–46
Depression (BDI-P)	9.3	4.7	0–60
Anxiety (SCL-A-P)	1.0	.8	0–4
Measures from 2003	<i>M</i>	<i>SD</i>	Range
<i>Young Adults (n=120)</i>			
Life Events (LEC)	2.2	1.5	0–11
Social Support (ISEL)	32.2	6.6	0–40
Perceived Stress (PSS)	17.4	5.9	0–56
Posttraumatic Stress (PTSDS)	16.9	11.4	0–46
Depression (BDI)	15.7	8.4	0–60
Anxiety (TAS)	43.7	8.5	20–80

Table 2

Correlations among study variables.

	2	3	4	5	6	7	8	9	10	11	12	13
1. C.Exposure (CSI)	.37	.35	.38	.26	.28	.31	.13	-.31	.24	.39	.29	.31
2.C.PTS (PTSS-C)		.45	.52	.12	.03	.14	.04	-.26	.15	.32	.29	.17
3. C.Depression (CDI)			.67	.27	.20	.26	.16	-.38	.29	.44	.34	.32
4. C.Anxiety (RCMAS)				.18	.09	.18	.12	-.34	.27	.31	.29	.23
5. P.PTS (PTSDS-P)					.75	.69	.12	-.27	.21	.34	.19	.15
6. P. Depression (BDI-P)						.65	.10	-.18	.14	.26	.14	.08
7. P. Anxiety(SCL-A-P)							.11	-.21	.28	.33	.16	.23
8. Y.A. Life Events (LEC)								-.23	.19	.32	.27	.31
9. Y.A. Social Support (ISEL)									-.62	-.56	-.64	-.61
10. Y.A. Perceived Stress (PSS)										.53	.70	.73
11. Y.A. PTS (PTSDS)											.56	.55
12. Y.A. Depression (BDI)												.69
13. Y.A. Anxiety (TAS)												

Note. C.=Child; P.=Parent; Y.A.=Young Adult. Bolded correlations were statistically significant ($p<.05$).

Table 3

Structural paths in the final model.

Path	Estimate	Standard Error	Z-value
A. War-TraumaExposure to Child Psychological Distress	.98	.24	4.13
B. War-Trauma Exposure to Parent Psychological Distress	1.83	.47	3.87
C. Parent Psychological Distress to Child Psychological Distress	0.07	.04	1.55
D. War-Trauma Exposure to Life Events	0.07	.06	1.31
E. Child Psychological Distress to Social Support	-.46	.11	-4.07
F. Life Eventsto Social Support	-.80	.39	-2.08
G. Child Psychological Distress to Young Adult Psychological Distress	.17	.11	1.56
H. Life Eventsto Young Adult Psychological Distress	.79	.38	2.08
I. Social Support to Young Adult Psychological Distress	-.77	.12	-6.51

Note. Significant z-values are bolded.