Childhood Violence Exposure on Emotion Regulation and PTSD in Adult Survivors

by

Madhur R. Kulkarni

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Doctoral Committee:

Professor Sandra A. Graham-Bermann, Chair
Associate Professor Julia S. Seng
Assistant Professor Sheila Rauch
Associate Professor Nnamdi Pole, Smith College

To my nieces Asha and Leela Kulkarni

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Chapter 1

Introduction

Many American children are exposed to violence. In the United States, an estimated 899,000 children were determined to have been subject to physical, sexual, and emotional abuse, and neglect (U.S. Department of Health & Human Services, 2005). Approximately 15.5 million American children have been found to witness inter-partner violence in their families at least once in the previous year, with 7 million estimated to live in families in which this violence was deemed "severe" (McDonald, Jouriles, Ramisetty-Mikler, Caetano, & Green, 2006). Among elementary and middle school children (n=500) in an inner-city community, 30% witnessed a stabbing and 26% witnessed a shooting (Bell and Jenkins, 1993; for a full review, see Stein, Jaycox, Kataoka, Rohodes, and Vestal, 2003). Such exposure to violence in childhood is potentially traumatic and has been found to be a risk factor for the development of several deleterious mental health outcomes in childhood and adulthood. In particular, two outcomes that are found among child trauma survivors that has garnered attention are disruptions in emotion-related processes (e.g., Herrenkohl, Herrenkohl, Egolf, & Wu, 1991; Tull, Jakupcak, McFadden, & Roemer, 2007) and the development of posttraumatic distress disorder (PTSD) symptoms (e.g., Brewin, Andrews, & Valentine, 2000; Kilpatrick, Ruggiero, et al., 2003).

This dissertation project examines the potential adulthood psychological sequelae of childhood violence exposure: adulthood emotion deficits, emotional regulation difficulties, and

PTSD. Specifically, this project has three aims: (1) to determine whether childhood victimization or adult trauma exposure is predictive of differences in emotion, emotion regulation, and PTSD outcomes; (2) to determine whether a purported psychophysiological indicator of emotion regulation (i.e., respiratory sinus arhythmia or "RSA") mediates the relationship between childhood victimization and PTSD severity, and finally (3) to determine whether different types of childhood violence exposure (e.g., witnessing domestic violence or experiencing child abuse) are uniquely predictive of psychiatric diagnoses and distress severity. The following three studies pursue these aims.

The first study attempts to differentiate the relationships that childhood victimization and adulthood trauma exposure have with emotion deficits, emotion regulation difficulties, and PTSD severity among retired police officers. Prior research has documented that active duty police officers are exposed to a high rate of occupational, traumatic stressors (Weiss et al., 1999), and face increased risk for developing PTSD (Pole et al., 2001). Thus, this group affords the opportunity to examine the relationship between childhood victimization and adult trauma exposure in the development of adulthood emotion-related difficulties and PTSD. This study presents a secondary analysis using data collected as part of a larger, ongoing study of risk and resilience factors for post-retirement adjustment among police officers. This study investigates whether childhood victimization is related to emotion-related difficulties, emotion regulation deficits, and PTSD severity, and if the potential differences in emotion regulation mediate the relationship between childhood victimization, and various basic emotion dysfunctions and PTSD severity. This study also examines whether childhood victimization moderates the relationship between adult trauma exposure, and emotion deficits, emotion regulation problems, and PTSD. Finally, it will

probe whether childhood victimization moderates the relationships between adulthood trauma exposure and emotion deficits, emotion regulation problems, and PTSD severity.

The second study continues an examination of retired police-officers. Based on a sub-sample from the above-mentioned study on retired police officers who participated in a series of laboratory stress tasks, this study asks whether childhood victimization is related to a physiological indicator of emotion regulation called respiratory sinus arhythmia or "RSA" after controlling for adulthood trauma exposure. Next, this study examines if childhood victimization moderates the relationship between adulthood trauma exposure and RSA. Lastly, the study will investigate if RSA mediates the relationship between childhood victimization exposure and PTSD severity.

The third and final study examines childhood violence exposure among a sample of pregnant women in the community. This study also presents a secondary analysis utilizing data collected as part of a larger investigation, the Stress, Trauma, Anxiety, and the Childbearing Year project (STACY). STACY is a prospective, multiple-cohort study that is examining the relationship between PTSD and adverse outcomes from early pregnancy through the postpartum period. The present study examines PTSD, coping, and mental health treatment among four groups of pregnant women in a community sample: witnesses of interpersonal violence ("witnesses") in childhood, those who experienced child abuse ("abused"), survivors of child abuse that also witnessed IPV ("combined"), and a comparison group that did not experience either type of early trauma. Specifically, this study investigates if group membership predicts PTSD-related outcome variables (i.e., PTSD diagnoses, number of PTSD symptoms, and PTSD symptom clusters), as well as examines

the relationship between group membership and the selection of coping strategies and mental health options.

References

Bell, and Jenkins (1993). Community violence and children on Chicago's southside. *Psychiatry, 56*, 46.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*(5), 748-766.

Herrenkohl, R., Herrenkohl, E., Egolf, B., & Wu, P. (1991) The developmental consequences of child abuse: The Lehigh Longitudinal Study. *In R. H.* Starr, Raymond, Jr. & D.A. Wolfe (Eds), *The effects of child abuse and neglect: Issues and research* (pp. 57-81). New York, NY, US: Guilford Press.

Kilpatrick, D. G., Ruggiero, K. J., Acierno, R., Saunders, B. E., Resnick, H. S., & Best, C. L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: Results from the national survey of adolescents. *Journal of Consulting and Clinical Psychology, 71*(4), 692-700.

McDonald, R., Jouriles, E., Ramisetty-Mikler, S., Caetano, R., & Green, C. (2006, March). Estimating the number of American children living in partner-violent families. *Journal of Family Psychology*, *20*(1), 137-142.

Pole, N., Best, S. R., Weiss, D. S., Metzler, T., Liberman, A. M., Fagan, J., et al. (2001). Effects of gender and ethnicity on duty-related posttraumatic stress symptoms among urban police officers. *Journal of Nervous and Mental Disease, 189*(7), 442-448.

Stein, B., Jaycox, L., Kataoka, S., Rhodes, H., & Vestal, K. (2003, December). Prevalence of child and adolescent exposure to community violence. *Clinical Child and Family Psychology Review*, *6*(4), 247-264.

Tull, M. T., Jakupcak, M., McFadden, M. E., & Roemer, L. (2007). The role of negative affect intensity and the fear of emotions in posttraumatic stress symptom severity among victims of childhood interpersonal violence. *Journal of Nervous and Mental Disease, 195*(7), 580-587.

U.S. Department of Health and Human Services, Administration on Children, Youth and Families. (2005). Child maltreatment 2003. Washington, DC: U.S. Government Printing Office.

Weiss, D. S., Brunet, A., Metzler, T., Best, S. R., Fagan, J., & Marmar, C. R. (1999). Critical incident exposure in police officers: Frequency, impact, and correlates. *Paper presented at the meeting of the international society for traumatic stress studies*, Northbrook, Illinois.

Chapter 2

Differential Relationships of Childhood Victimization and Adulthood Trauma with Emotion, Emotion Regulation, and PTSD Severity

In the United States, 3.5 million allegations of abuse on behalf of 6 million children were made to Child Protective Service agencies in the year 2005. Of those investigated, an estimated 899,000 children were determined to have been subjected to neglect or physical, sexual, or emotional abuse (U.S. Department of Health & Human Services, 2005). Such early exposure to childhood victimization is potentially traumatic and is a risk factor for the development of several disruptions in multiple domains of functioning, including cognitive and motor development (e.g., Stafford, Zeanah, & Scheeringa, 2003; Pine, Costello, & Masten, 2005), interpersonal development and skills (e.g., Cicchetti & Lynch, 1995; Shonk & Cicchetti, 2001), and physical health (e.g., Graham-Bermann & Seng, 2005). In particular, prior research finds that childhood victimization has been linked to the development of PTSD (e.g., Kessler, Davis, & Kendler, 1997).

Clinical research on these children has been particularly interested in the unique constellation of emotional problems they often exhibit. For example, such children are reported to have atypical emotional experiences and processes, which can include less positive emotion (e.g., Bugental, Blue, & Lewis, 1990) and more negative emotion (e.g., Herrenkohl, Herrenkohl, Egolf, & Wu, 1991; Graham-Bermann, 1996); atypical processing

of emotion, such as heightened ability to identify fearful faces (e.g., Masten, et al., 2008); difficulty distinguishing between emotions (During & McMahon, 1991; Klimes-Dougan & Kistner, 1990), and other internalizing and externalizing behaviors associated with emotional difficulties, such as increased social withdrawal, somatic complaints, and suicidal ideation (e.g., Aber, Allen, Carlson, & Cicchetti, 1989; Kaufman & Cicchetti, 1989; Salzinger, Feldman, Hammer, & Rosario, 1991). Additionally, the trauma literature has documented that these victimized children are at increased risk for subsequently developing childhood psychopathology, particularly PTSD (e.g., Kilpatrick, Ruggiero, et al., 2003; Lansford et al., 2006; MacMillan & Harpur, 2003).

Markedly similar affective and psychological difficulties are found to be present among many childhood victimization survivors who are now adults. In particular, prior studies have found that childhood victimization survivors differed from non-childhood victimization exposed individuals in frequency and intensity of negative emotions (e.g., Tull, Jakupcak, McFadden, & Roemer, 2007). Among adult survivors, there is also heightened risk for a myriad of psychiatric disorders, such as PTSD (e.g., Brewin, Andrews, & Valentine, 2000; Hetzel & McCanne, 2005; Widom, 1999). Consequently, while clinical science has thoroughly documented various correlates of childhood victimization in adulthood, much is still unknown about what potentially underlies these emotion-related outcomes, particularly the potential mediators for these emotion-related consequences, as well as whether such outcomes are related to childhood victimization or to later adulthood trauma exposure.

Role of Emotion Regulation

The study of emotion regulation (ER), defined as the set of inter-related psychological and physiological processes that allow individuals to modulate their feelings, behavior, and

physiological responses (Gross, 1998b; 2001), may provide some insight into the mechanisms behind these post- childhood victimization phenomena. The support for further investigation of the interaction between child victimization exposure, emotion, and emotion regulation processes to gain better understanding of adult-survivors of childhood victimization is compelling. The above-mentioned negative outcomes associated with childhood victimization all share a common clinical feature: a pervasive inability to appropriately and effectively regulate emotion and emotional processes. This suggests a potential relationship between childhood victimization exposure, psychopathology, and potential dysfunction in emotion and emotion regulation processes. This would be consistent with clinical theory, which posits that emotion regulation and emotion-related processes hold a central role in mental health and socio-emotional functioning (Gross & Munoz, 1995; Kring & Werner, 2004), as well as clinical research, which has provided preliminary support for this contention. Emotion and ER difficulties have been linked to psychiatric distress (i.e., anxiety and depression, Garnefski et al., 2002); for instance, depressed individuals are shown to have emotion abnormalities (e.g., less differential reactivity to sad stimuli than non-depressed individuals, Rottenberg, Kasch, Gross, & Gotlib, 2002; Tsai, Pole, Levenson, & Munoz, 2003) and shown to use problematic emotion regulation strategies (e.g., rumination; Morrow & Nolen-Hoeksema, 1990).

Developmental theory supports the contention that childhood victimization exposure may be related to emotion and emotion regulation deficits in children and adults. Many developmental psychologists argue that emotion regulation develops in infancy and childhood through interactions with caregivers. Caregivers initially regulate a child's emotions and, over time, children are thought to internalize a competence to employ these

emotion regulation strategies and emotionally regulate themselves (Malatesta & Haviland, 1982; Parker, Hadzi-Pavlovic, Brodaty, & Boyce, 1992). Family context has been found to be a key factor in the healthy development of emotion regulation (Morris, Sheffield, Silk, & Steinberg, 2007), and in the absence of appropriate caregiving, has a significant adverse impact on children's emotion regulation (e.g., Garber & Dodge, 1991), such as increased risk for developing psychopathology (Silk, Shaw, Skuban, Oland, & Kovacs, 2006).

Maltreated children are seen to exhibit more dysregulated emotion regulation patterns that are associated with negative outcomes in childhood. For instance, Shields, Ryan, & Cicchetti (2001) found that maltreated children were more likely to suffer from emotion dysregulation, inappropriate emotional lability, rigid responsiveness, and inability to adapt their emotional arousal. Such emotion dysregulation was significantly correlated with starting fights and being more disruptive. Similarly, Maughan and Cicchetti (2002) found that maltreated children were significantly more likely to have either an overcontrolled/unresponsive emotion regulation pattern or an undercontrolled/ambivalent emotion regulation pattern than their non-maltreated counterparts. They also reported that the undercontrolled/ambivalent emotion regulation pattern was associated with more behavioral problems and mood problems. Research on sexually maltreated children found that they were more likely than their non-maltreated peers to show fewer adaptive emotion regulation skills (i.e., less situational appropriateness of affective displays) and more emotion dysregulation (i.e., greater degree of mood lability, rigidity, dysregulated negative affect, and inappropriate affective displays) than non-maltreated children (Browne & Finkelhor, 1986; Shipman et al., 2007; Shipman, Zeman, Penza, & Champion, 2000). Due to the cross-sectional nature of these studies, it is unclear whether the emotion difficulties due to child

victimization persist into adulthood and how such difficulties may be impacted by later trauma exposure.

The adult literature examining the relationship between childhood victimization and emotion regulation difficulties in adults is considerably less developed and currently consists of a few studies that focus on affect dysregulation (McLean, Toner, Jackson, Desrocher, & Stuckless, 2006; van der Kolk, 1996; Wolfsdorf & Zlotnick, 2001). van der Kolk's (1996) paper found that early trauma was related to affect dysregulation: difficulties with affect modulation, unmodulated anger, self-destructiveness, suicidal behavior, and unmodulated sexual involvement. In a study on adult female childhood survivors, McLean et al. (2006) found that affect dysregulation was positively correlated with dissociation, and somatization was positively associated with alexithymia. While these studies are informative, they fail to examine potential underlying mechanisms for the emotion regulation problems.

Adult research on childhood victimization survivors has predominantly focused on the relationship between ER difficulties and other emotional difficulties (i.e., alexithymia; McLean et al., 2006), interpersonal problems, and functional impairment (Cloitre, Miranda, Stovall-McClough, & Han, 2005). Prior research has also documented the relationship between ER difficulties and the development of psychological disorders, including generalized anxiety disorder (Mennin, Heimberg, Turk, & Fresco, 2006; Salters-Pedneault, Roemer, Rucker, & Tull, 2006); somatoform disorders (for review, see Waller & Scheidt, 2006); depression (e.g., Rude & McCarthy, 2003), borderline personality disorder (Yen, Zlotnick, & Costello, 2002), and PTSD (McLean et al., 2006; Tull, McMillan, and Roemer, 2007; Zlotnick, Mattia, & Zimmerman, 2001).

Additionally, recent research suggests a potential relationship between PTSD and emotion regulation. For instance, Tull et al. (2007) studied the relationship between emotion regulation difficulties and posttraumatic stress symptoms among ethnically diverse undergraduates and found that symptom severity was related to overall emotion regulation difficulties. Posttraumatic stress symptoms were related to a lack of emotional acceptance, impulse-control difficulties, lack of emotional clarity, limited access to effective emotion regulation techniques, and difficulty in engaging in goal-oriented behavior; and finally, individuals that met criteria for a PTSD diagnosis reported significantly more emotion regulation difficulties than those at sub-threshold levels. In contrast, Cloitre and colleagues (2005) found that while emotion regulation was not significantly associated with PTSD, both emotion regulation and PTSD were significantly correlated to functional impairment and impersonal problems. This preliminary work in the study of emotion and PTSD tentatively suggests a relationship between these two phenomena and provides impetus to not only further substantiate this relationship but also better understand the manner in which varied trauma exposure, such as adult and childhood trauma exposure, may relate to affective difficulties and PTSD severity.

When studying adult survivors of childhood victimization, there is particular interest in how negative emotions are modulated internally, as well as the external behaviors used to manage emotionally provocative or arousing situations. First, emotion regulation research has examined the cognitions or behaviors used with the expectation of regulating or controlling negative moods or feelings (Catanzaro & Mearns, 1990). Second, emotion regulation research has also identified two common strategies for "down-regulating" emotions: cognitive reappraisal and emotional suppression (Gross, 2001). Cognitive

reappraisal is changing how one thinks about a situation in order to decrease its emotional impact, while emotional suppression is viewed as inhibiting the behavioral expressions of emotion after the emotional experience has begun (Gross, 2001). Both in manipulated studies and studies of spontaneous emotion regulation, emotional suppression was found to decrease behavioral expression of negative affect (e.g., frowning when angry), and had no impact on the actual subjective emotional experience, heightened physiological arousal, and impaired memory (Gross, 2001; Egloff, Schmukle, Nurms, & Schwerdtfeger, 2006). Furthermore, suppression has been found to be detrimental in the long-term, as it is associated with various physical and psychological stress symptoms over time (Wastell, 2002). Cognitive reappraisal is thought to be more effective than suppression because reappraisal is found to diminish the emotional experience (e.g., disgust) and behavioral expression of that emotion with no impact on physiological responding or memory (Gross, 1998a; Gross, 2001). Additionally, reappraisal is not associated with negative psychological and physical health outcomes (Wastell, 2002).

Role of Adulthood Trauma Exposure

Another empirical gap centers on adulthood trauma exposure. Adulthood trauma exposure has been found to be associated with quite similar negative outcomes, such as increased risk for the development of psychopathology and impairment, as evidenced by the extant rape-survivor, combat veteran, refugee, and disaster literatures (e.g., Johnson & Thompson, 2008; Katz, Pellegrino, Pandya, Ng, & DeLisi, 2002; Lenox & Gannon, 1983; Stimpson, Thomas, Weightman, Dunstan, & Lewis, 2003). In addition, prior research suggests that additional trauma exposure following an event increase the risk for PTSD (Lloyd & Turner, 2003; Yehuda et al., 1995). Given the recent evidence that adulthood

trauma exposure has similar outcomes, it is unclear whether these emotional and psychiatric sequelae are due to child victimization exposure or adulthood trauma exposure. The majority of studies that have examined emotional correlates did not control for the contribution of adulthood trauma exposure to the development of altered emotional processes. Research is needed to examine the relationship between childhood victimization and emotion regulation difficulties in adulthood, and to ascertain if emotion-related difficulties are accounted for by recent trauma, early trauma, or a combination of both.

The ability to differentiate between the outcomes due to adult and childhood trauma exposure may be particularly useful in clinical theory and practice in populations exposed to high levels of adulthood trauma exposure, such as veterans, domestic violence adult survivors, adult refugees, and emergency personal (i.e., firefighters and police officers). Finally, while previous research examining childhood victimization and/or adulthood trauma exposure on adults, these trauma exposures have not been as well studied among older adults. This gap in the empirical literature results hinders our understanding of the potential distress that may result from these forms of trauma exposure and potential treatment needs of older individuals with complex trauma histories.

Present Study

This study investigated the influence of childhood victimization relative to adulthood trauma exposure on emotion, emotion regulation, and PTSD in retired police officers. Police officers represent a population exposed to a high rate of potentially traumatic stressors (as defined in the DSM-IV criterion A for PTSD) (Weiss et al., 1999), as well as a high degree of routine, non-traumatic work environment stressors (Liberman, Best, & Metzler, 2002), and active duty police officers are found to express a broad range of PTSD symptoms (Pole et

al., 2001). Given the multiple traumatic experiences that are likely to occur over the course of police work, this group affords the opportunity to examine the relationship between childhood victimization exposure and adulthood trauma exposure in the development of adulthood emotion, emotion regulation, and PTSD difficulties. The present paper addressed four research questions:

1. Is childhood victimization related to emotion-related difficulties, emotion regulation deficits, and PTSD severity? It was hypothesized that childhood victimization would positively relate to more negative affect and less positive affect, lower expectancy of negative mood regulation, greater emotional suppression, and less emotional reappraisal; and greater PTSD severity.

2. Is childhood victimization significantly related to emotion-related difficulties, emotion regulation deficits, and PTSD severity after adjusting for adulthood trauma exposure severity and other potentially confounding variables (e.g., other childhood trauma exposure and influential background variables)? It was hypothesized that a history of childhood violence exposure would continue to predict the above-mentioned emotion-related deficits, emotion regulation deficits, and PTSD after adulthood trauma and other potentially confounding variables are statistically controlled.

3. Do the differences in emotion regulation (outlined above) mediate the relationship between childhood victimization and emotion, and childhood victimization and PTSD severity? It was hypothesized that emotion regulation mediates the relationship between childhood victimization and basic emotion dysfunctions (i.e., higher negative affect and less

positive affect), as well as childhood victimization and PTSD severity (more PTSD symptoms).

4. Does childhood violence moderate the relationships between adulthood trauma exposure and emotion deficits, emotion regulation problems, and PTSD severity? It was predicted that there would be a linear relationship between adulthood trauma exposure and these outcomes, and that increased childhood victimziation would have an additive effect on the relationships between adulthood trauma exposure and emotion deficits (more negative affect and less positive affect), emotion regulation problems (lower expectancy of negative mood regulation, greater emotional suppression, and less emotional reappraisal), and PTSD severity (more PTSD symptoms).

Method

Participants

The larger study on risk and resilience factors for post-retirement adjustment recruited 150 retired police officers from all over the United States via professional newsletters to participate in a study of predictors of negative mental health adjustment following police work. Participants were required to have been exposed to at least one critical incident of sufficient seriousness to meet *Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition* (DSM-IV) criterion A1 for posttraumatic stress disorder (American Psychiatric Association, 2000). The participants reported involvement in some of the most serious traumatic events to strike the U.S., including the Detroit riots, Oklahoma City bombing, Columbine shooting, and 9-11 attack on New York City. Eligible participants gave written informed consent and were sent self-report questionnaires (partially described

below), which they completed in their homes for $50 reimbursement. Data were collected between October 2004 and December 2007. Due to incomplete or missing data, only 142 participants will be examined in the present study.

Measures

Demographics. Participants reported on their age, gender, years of education, military history, years of police service, and marital status.

Non-duty Related Trauma History. This study used an adaptation of the 28-item *Trauma History Questionnaire* (THQ; Green, Rogers, & Hedderley, 1996) to assess lifetime exposure to non-duty related traumatic events (e.g., accidents, sexual assaults, muggings, disasters). For each item, respondents were asked whether a particular traumatic event occurred (yes/no). Participants were asked to indicate the earliest age at which each trauma occurred and the most recent age that the trauma occurred. Four trauma summary scores were calculated from these items. First, a childhood victimization-exposure score ("childhood victimization") was calculated by adding the THQ items that indicated the number of types of victimization-related traumatic events endorsed and reported to have occurred before age 18 (i.e., emotional abuse, direct experience of terrorist act or war; rape, sexual molestation, incest, or other unwanted sexual contact; physically attacked with or without a weapon; physical abuse, serious neglect, or being held captive/tortured/kidnapping). Second, an "other" childhood trauma exposure score ("other childhood trauma") was calculated by adding the THQ items that indicated the number of types of traumatic events reported to have occurred before age 18 in which the participant was not directly victimized (i.e., those items related to experiencing robbery, disaster, witnessing death/seeing dead body, serious illness, and confronted with serious injury). Third, an adult victimization score ("non-duty

adult victimization") was calculated by summing the number of types of victimization-related traumatic events endorsed and reported to have occurred after the age of 18 (the same items referenced in the childhood victimization variable). Fourth, an adult non-victimization trauma score ("other non-duty adulthood trauma") was calculated by summing the number of types of non-victimization traumatic events endorsed and reported to have occurred after the age of 18 (the same items referenced in the other childhood trauma variable).

Duty-related trauma was assessed using the *Critical Incident History Questionnaire* (CIHQ; Weiss et al., 2005), a measure that asks respondents how frequently they were exposed to each of 40 police-related "critical incidents" (e.g., being present when a fellow officer was killed, being shot at, making a mistake that led to the serious injury of a bystander). In the initial development of the measure, Weiss et al. (2005) found that the total score shows good test-retest reliability ($r = .63$). For the purposes of this study, this instrument was scored by adding the number of types of critical incidents experienced by the respondent to generate two scores: duty-related victimization and duty-related other trauma. Duty-related victimization is composed of duty-related incidents in which police officers were directly victimized by acts of aggression or threat of aggression (i.e., injured intentionally, seriously beaten, threats to family due to police work, shot, taken hostage, threatened with weapons, having your life threatened by an aggressive dog, or managing a riot or aggressive crowd). Duty-related "other" trauma refers to other traumatic incidents that do not deal with direct victimization (e.g., being in a duty-related serious car accident or seeing a mutilated body).

The *Mississippi Scale—Civilian Version (MS–CV)* is a 40-item measure of cumulative PTSD-related symptoms adapted from the Mississippi Scale for Combat-Related

Posttraumatic Stress Disorder (Keane, Caddell, & Taylor, 1988). Measure items were slightly revised in order to replace references to military service with the respondent's cumulative potentially traumatic experiences as a police officer. Each item was rated on a 5-point scale from 1= "not at all true" to 5= "extremely true." The 40-item version of the MS–CV included previously missing *DSM–IV* PTSD symptoms in addition to the original 35 items. The measure was then scored by summing the 40 items (range=40 to 200; α = .93) which indexed the severity of all *DSM–IV* PTSD symptoms and assessed the severity of reexperiencing (α = .83), avoidance/numbing (α=.78), and hyperarousal symptoms (α = .76), plus associated features. The present study reported findings related to total scale score.

The *Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003) is a 10-item self report measure that assesses individual differences in the habitual use of two emotion regulation strategies: cognitive reappraisal (e.g., "When I want to feel more positive emotions, I change what I'm thinking about") and expressive emotional suppression (e.g., "When I am feeling negative emotions, I make sure not to express them"). Participants were asked to respond based on their agreement or disagreement with the items using a 7-point scale ranging from 1= strongly disagree to 7 = strongly agree. Both the cognitive reappraisal subscale (αs ranging from .75 to .82) and emotional suppression subscale (αs ranging from .68 to .76) have shown very good internal consistency and three month test-retest reliability (r = .69). Both the cognitive reappraisal and emotional suppression subscales were used in the present study.

Negative Mood Regulation (NMR; Cantarazo & Mearns, 1990) is a 30-item self-report measure of cognitions or behaviors that participants use with the expectation of regulating or controlling negative moods or feelings. Participants were asked to state their general

agreement or disagreement with items as they pertain to their usual strategy when they are "upset" using a 5-point scale ranging from 1= strongly disagree to 5 = strongly agree. The NMR has three subscales. The general subscale refers to the possibility that negative moods may or may not be alleviated without reference to specific strategies for doing so such as, "I can usually find a way to cheer myself up." The cognitive subscale refers to thought strategies that may influence negative moods, such as "telling myself it will pass will help calm me down." Finally, the behavioral subscale refers to actions that might affect one's negative mood such as "Seeing a movie won't help me feel better." Psychometric studies have found that the total scale has internal consistency ranging from $\alpha = .86$ to $\alpha = .91$. Test-retest reliability within a 3 to 8 week period has ranged from $r = .67$ to .78. The present study will focus on total scale, which is the sum of all items.

Positive and Negative Affect Schedule (PANAS-F; Watson, Clark, and Tellegen, 1988) is a 38-item modification of the original 20-item PANAS. Participants were given a list of various feelings and emotions and are asked to indicate the extent they have felt each feeling or emotion in the last four weeks, ranging from 1 = "very slightly or not at all" to 5 = "extremely." Positive mood, which refers to a dimension that ranges from "sadness and lethargy" to "high energy, full concentration, and pleasurable engagement," was assessed by items, such as "excited" and "happy." Negative mood which refers to a dimension that ranges from "calmness and serenity" to "a variety of aversive mood states" was assessed by items such as "disgusted" or "anxious." The negative affect scale has been shown to be moderately to strongly correlated with general psychiatric distress on the Symptom Checklist-90-Revised, depression symptoms on the Beck Depression Inventory, and state anxiety on the State Trait Anxiety Inventory. The revised positive "mood" scale had internal

consistency of $\alpha = .90$ and the revised negative "mood" scale had internal consistency of $\alpha = .84$. An additional 18 items (nine positive items and nine negative items; e.g., angry, anxious, happy, and relaxed) were added to the PANAS (Tugade & Fredrickson, 2004). This extended version of the PANAS was examined utilizing principal-components factor analysis and accounted for 42% of the common variance in contrast to the 30% found for the original version (Watson et al., 1998). This study utilizes the 10-item Positive Affect and Negative Affect scales, as well as the additional 9-item positive and negative scales.

Data Cleaning and Data Reduction

All measures were entered into SPSS 15.0, then double-checked for accuracy by another research assistant, and scored according to published conventions. Four trauma summary scores were generated from the THQ and CIHQ to differentiate between childhood and adulthood trauma exposure, and then victimization versus non-victimization trauma exposure. As discussed above, the "childhood victimization" summary score was calculated by adding the THQ items that indicated the number of types of victimization-related traumatic events endorsed and reported to have occurred before age 18 while the "other childhood trauma summary score" was calculated by adding the THQ items that indicated the number of types of traumatic events reported to have occurred before age 18. A new adult victimization summary score ("adult victimization") was calculated by summing the standardized score (z score) for the THQ non-duty adult victimization score (described above) and the standardized score (z score) for the CIHQ duty-related victimization score. An adult non-victimization trauma summary score ("other adulthood trauma") was calculated by summing the standardized score (z score) for the THQ non-duty other adulthood trauma score (described above) and the standardized score (z score) for the

CIHQ other duty-related trauma score. Thus, the "adult victimization" is the total standardized number of types of adult victimization that was reported to have occurred after age 18 (including those related to police-duty) and "other adulthood trauma" is the total standardized number of types of adult non-victimization traumatic events that was reported to have occurred after age 18 (including those related to police-duty).

Data Analyses

Preliminary analyses for this study involved examining descriptive statistics for demographic characteristics for the overall sample. Individual sample *t* tests were also conducted to compare participants that were included in this study (n = 142) with those excluded due to missing/incomplete data (n = 8), and to determine if there were significant differences between groups on all study variables based on available data.

Pearson's correlation (*r*) analyses were conducted amongst the study's dependent variables, primary predictor variables, and key demographic characteristics. These analyses were used to ascertain if childhood victimization was bivariately related to emotion-related difficulties, emotion regulation deficits, and PTSD severity. These analyses were also employed to examine the outcomes' relationships to potential covariates (e.g., other childhood trauma and demographic variables) and the relationships amongst the outcome variables. Next, blocked entry, step-wise logistic regression analyses were conducted to answer whether childhood victimization was still related to emotion deficits, emotion regulation difficulties, and PTSD severity after statistically controlling for all adulthood trauma exposure (adult victimization and other adulthood trauma) and other potential covariates (e.g., age or gender). Some of these correlations addressed specific hypotheses and were done without a correction for Type I error because they were specifically predicted.

Then mediator analyses utilizing blocked entry, step-wise logistic regression analyses (Baron & Kenny, 1986) were employed to determine whether the emotion regulation difficulties found in the previous analyses mediated the relationship between childhood victimization and emotion deficits, and the relationship between childhood victimization and PTSD severity. These analyses were conducted with and without covariates entered into the model. Finally, moderator analyses using forced-entry, linear regression (Baron & Kenny, 1986) examined the potential moderating role of childhood victimization on the relationship between PTSD severity and all adulthood trauma exposure (adulthood victimization and/or other adulthood trauma). Moderator analyses were conducted after centering the relevant continuous variables, and the interaction terms were products of the centered variables. Potential multicollinearity was assessed by examining tolerance and Variance Inflation Factor (VIF) values, and then regression analyses were re-conducted excluding those problematic variables. Those variables with VIF values of greater than 10 were eliminated from the regression model. The resulting VIF values and standard errors were then examined to determine if the variable should be included or excluded from the final models. All statistical analyses were accomplished using SPSS 17.0. The threshold for significance was set at $p < .05$ (two-tailed).

Results

Descriptive Statistics

Table 1 presents descriptive data for the study sample. The entire study of 142 participants was composed of 131 males and 11 females, which consisted of 136 European American, two African American, two Latino, and one Native American participant. The mean age of participants was approximately 60 years and the mean duration of police service

was approximately 25 years. Participants were earning an average income of $67,180 per year, and they had an average of 15 years of education. Approximately 47% (n = 67) served in the military and approximately 83.8% of participants (n = 119) were currently married. Across the entire sample, 35 (24.6%) endorsed experiencing childhood victimization. Individual sample *t* tests compared the participants included and excluded from this study's analyses on all available data, and found no significant differences between the two groups on demographic variables, predictors, or outcomes.

[Insert Table 1 Here]

Question 1: Is Childhood Victimization Related to Emotion-related Deficits, Emotion Regulation Difficulties, and PTSD Severity?

Pearson correlation analyses were conducted to examine the relationships among childhood victimization, emotion, emotion regulation, PTSD, and all other study variables (i.e., trauma exposure and demographic characteristics). These results are presented in an intercorrelation matrix in Table 2. Childhood victimization was associated with younger age (r= -.23, p=.005) and lower total expectation of negative mood regulation (as measured by the NMR Total scale, r= -.24, p=.01). Childhood victimization was also positively associated with female gender (r= .31, p<0.001), negative affect (as measured by the PANAS new 9-item negative affect subscale) (r= 0.19, p=.02), the presence of other childhood trauma (r=.44, p<0.001), and greater PTSD symptom severity (as assessed by the Mississippi PTSD Scale) (r= .30, p<0.001).

[Insert Table 2 Here]

Contrary to this study's hypotheses, childhood victimization was not found to be significantly associated with emotion regulation (ERQ) suppression or reappraisal scores, or

the other emotion measures, i.e., PANAS subscales (10-item and 9-item new positive affect subscales and the 10-item negative affect subscale).

Question 2: Is Childhood Victimization Related to Emotion, Emotion Regulation, and PTSD Outcomes After Adjusting for Other Covariates?

The relationship between childhood victimization and PANAS 9-item Negative Affect subscale, Mississippi PTSD Scale total, and NMR Total after controlling for demographic variables was examined using forced-entry, regression analyses with predictors entered in three blocks: demographic characteristics, trauma exposure (e.g., adulthood victimization, other adulthood trauma, and other child trauma), and childhood victimization. Based on the correlation analyses discussed above, potential covariates were identified among demographic and trauma exposure variables (see Table 2) and entered in the models. Table 3 presents the final models predicting the negative affect (PANAS 9-item Negative Affect subscale); total expectation of negative mood regulation (NMR Total scale); and PTSD severity (Mississippi PTSD Scale) in Models A, B, and C correspondingly.

The findings for these analyses were mixed with respect to the study hypotheses. Consistent with the study's hypothesis, childhood victimization was negatively related to the total expectation of negative mood regulation (NMR Total scale) after controlling for gender, years of police service, income, and education, $\beta = -.22$, $p = .01$. Diverging from the study's hypotheses, childhood victimization was not significantly related to negative affect after controlling for income and gender, $\beta = .12$, $p = .15$, and childhood victimization was not significantly related to PTSD, $\beta = -.13$, $p = .10$, after controlling for age, gender, years of police service, income, adulthood victimization, and other adulthood trauma.

[Insert Table 3 Here]

Question 3: Does Emotion Regulation Mediate the Relationships between Child Victimization and Negative Affect, and Between Child Victimization and PTSD?

Blocked entry, step-wise logistic regression analyses tested for potential mediation by total expectation of negative mood regulation (NMR Total) on the relationships between childhood victimization and negative affect (PANAS 9-item negative affect subscale), and childhood victimization and PTSD severity (Mississippi PTSD scale). These analyses were conducted with and without the inclusion of relevant covariates, such as demographic characteristics and other trauma exposure.

Table 4 presents the two mediation analyses predicting the negative affect (PANAS 9-item negative affect subscale) titled Models A and B. The first model (Model A) investigated if total expectation of negative mood regulation (NMR Total) mediated the relationship between childhood victimization and negative affect (PANAS 9-item negative affect subscale). According to Baron and Kenny's (1986) approach for testing statistical mediation, three conditions must be satisfied. First, the predictor must be significantly related to the outcome. Step 1 of the regression analysis established that childhood victimization was significantly related to negative affect, $\beta = .19$, $p = .02$. This first condition is met. Second, the predictor must be significantly related to an intervening potential mediator, in this case total expectation of negative mood regulation (NMR Total). This was established above (see Table 2) and the second condition is acheived. Third, the predictor's relationship to the outcome must lose statistical significance when the potential mediator is entered into the model. In Step 2, childhood victimization loses statistical significance as a predictor when NMR Total was entered in the model so the third condition is met, $\beta = .06$,

p=.40. Thus, as hypothesized, when examined without covariates, emotion regulation (NMR Total) was a mediator between childhood victimization and current negative emotion (PANAS 9-item negative affect).

However, in the second model (Model B), which included relevant covariates (gender and income), the total expectation of negative mood regulation (NMR Total) does not meet the third condition for mediation. After controlling for these covariates in Step 1, childhood victimization was not significantly related to the outcome when entered in Step 2, β= .12, p=.15. Consequently, contrary to the study hypothesis, emotion regulation (NMR Total) did not mediate the relationship between childhood victimization and negative affect (PANAS 9-item negative affect subscale) after controlling for relevant covariates.

[Insert Table 4 Here]

Table 5 presents a parallel set of mediation analyses predicting the Mississippi PTSD Scale entitled Model A and B. After entering childhood victimization in Step 1 in the model without relevant covariates, the total expectation of negative mood regulation (NMR Total scale) did not mediate childhood victimization in Step 2, β= .19, p=.012. This finding failed to support the study's hypothesis that emotion regulation would mediate the childhood victimization to PTSD symptom severity relationship. However, in the model with covariates (years of police service and other adulthood trauma), childhood victimization lost statistical significance as a predictor before emotion regulation was entered (as indexed by the NMR Total score), β= .13, p=.06. Thus, after controlling for covariates, the NMR Total scale did not mediate the relationship between childhood victimization and the Mississippi PTSD Scale. This finding failed to support the study's hypothesis that total expectation of

negative mood regulation would mediate the relationship between childhood victimization and PTSD after controlling for covariates.

[Insert Table 5 Here]

Question 4: Does Childhood Victimization Moderate the Relationship Between Adulthood Trauma Exposure and Negative Affect or Emotion Regulation?

The final analyses examined if childhood victimization moderated the relationships between adulthood trauma exposure and the three outcomes: negative affect (PANAS 9-item negative affect subscale), total expectation of negative mood regulation (NMR Total scale), and PTSD severity (Mississippi PTSD scale). Findings are presented in Table 6. Moderator analyses utilized blocked entry, step-wise logistic regression analyses. To test for potential moderation, Baron and Kenny's (1986) test for statistical moderation requires that three conditions be met as disclosed above. First, the predictor must be related to the outcomes. However, neither adulthood victimization nor other adulthood trauma was found to be related to the same emotion or emotion regulation measure to which childhood victimization, the proposed moderator, was related. Thus, due to this lack of association, childhood victimization cannot be a moderator between adulthood trauma exposure and the emotion measures in this study, or between adulthood trauma exposure and the emotion regulation measures in this study.

However, elevated PTSD severity was related to greater exposure to other adulthood trauma, r= .23, $p<0.01$, and adulthood victimization, r= .20, $p<0.05$, and thus met the first condition needed for statistical moderation. Second, the moderator (childhood victimization) must be related to PTSD severity and this condition was met, $r= .30$, $p<0.001$. The final

condition necessitates that the interaction of the predictor and moderator is significantly related to the outcome after controlling for both the predictor and moderator. Blocked entry, step-wise logistic regression analyses were conducted to test this last condition. In the final step of the regression analyses, both models revealed that when the interaction terms were entered, and they were found not to exert a statistically significant effect. Thus, childhood victimization did not moderate the relationship between adulthood trauma exposure and the PTSD severity. These findings failed to support the hypotheses that childhood victimization would moderate the relationships between adulthood trauma exposure and the PTSD severity, emotion, and emotion regulation outcomes.

[Insert Table 6 Here]

Discussion

The purpose of this study was to examine the relationships among childhood victimization, emotion, emotion regulation, and PTSD among retired police officers. This adult population offers an opportunity to examine the complex relationships among trauma exposure, emotion-related processes, and PTSD among individuals later in the life-span in a group that is known to have experienced numerous traumatic experiences and documented to be at increased risk for the development of PTSD (Weiss et al., 1999; Pole et al., 2007). To date, no previous single study has examined childhood and adulthood trauma exposure, emotion regulation, and PTSD together. The present study is not only unique in its attempt to examine these constructs in a single study but also in its attempt to differentiate the contribution of childhood victimization to these emotion and PTSD outcomes from the contribution of other forms of trauma (e.g., other childhood trauma, adulthood victimization, and other adulthood trauma).

Childhood Victimization and Emotion. Childhood victimization was found bivariately related to negative affect, a finding consistent with previous studies on child survivors (e.g., Herrenkohl, Herrenkohl, Egolf, & Wu, 1991; Graham-Bermann, 1996) and adult survivors of child victimization (e.g., Tull, Jakupcak, McFadden, & Roemer, 2007). However, in the regression analyses models predicting negative affect that statistically controlled for demographic factors, this relationship was seen to be no longer significant. Female gender and having less income were more strongly correlated to negative affect in this sample. This loss of statistical significance may have been due to the well known influence of gender on emotion; prior emotion research has found that there are significant differences in self-reported emotion, and women have been found to report significantly more negative emotion than men (e.g., Simon & Nath, 2004). Perhaps this significant finding would have been preserved had the analyses excluded women or if the study focused exclusively on women.

Additionally, this study adds to this literature by examining the relationship between adulthood trauma exposures with negative affect. In this sample, neither adulthood victimization nor other adulthood trauma exposure was found related to negative affect. This may suggest that when compared to adults exposed to both forms of adulthood trauma exposure, childhood victimization has a greater relative influence on the presence of negative affect than both forms of adulthood trauma exposures. However, contrary to previous research on individuals exposed to childhood victimization (e.g., Bugental, Blue, & Lewis, 1990), this victimization was not found significantly related to positive affect.

Childhood Victimization and Emotion Regulation. This study extends the literature by assessing the relationship between emotion regulation and childhood victimization with

multiple measures of emotion regulation, which yielded mixed findings. As hypothesized, childhood victimization was related to lower total expectation of negative mood regulation even after controlling for demographic differences. Consistent with preliminary research that linked childhood victimization to emotion regulation difficulties in adult survivors (e.g., McLean et al., 2006), this study provided further empirical evidence of a relationship between childhood victimization and emotion regulation difficulties. Yet contrary to the study's hypotheses, childhood victimization was not found to be related to emotional suppression and emotional reappraisal. These mixed findings among the two emotion regulation measures suggest that childhood victimization may be related to specific types of emotion regulation difficulties and not others.

Childhood Victimization and PTSD. Childhood victimization was found bivariately related to PTSD but was not significantly related to PTSD after controlling for demographic variables and adulthood trauma exposure (adulthood victimization and other adulthood trauma). A positive relationship between childhood victimization and PTSD was predicted based on findings from prior research (e.g., Brewin, Andrews, & Valentine, 2000; Hetzel & McCanne, 2005; Widom, 1999). In the final regression model, non-victimization, or "other" adult trauma, remained significant in predicting PTSD while both adult victimization and childhood victimization were not significantly related predictors. The significance of other adult trauma as a predictor relative to both forms of victimization was unanticipated. This finding may suggest that individuals exposed to childhood victimization are less sensitive to adult victimization, perhaps due to a level of habituation to interpersonal aggression, while they may remain sensitive to traumatic experiences that are non-interpersonal in nature (e.g., car accidents or seeing a mutilated body). Alternatively, this sample of childhood

victimization survivors may be biased; perhaps individuals that self select to join the police force are more resilient with respect to their posttraumatic distress responses related to their childhood victimization, and thus their PTSD is a result of later trauma exposure.

Additionally, this study did not find an additive effect of adulthood and childhood trauma exposure on PTSD severity. Prior research has supported the contention that cumulative exposure would be associated with worse PTSD outcomes (Lloyd & Turner, 2003; Yehuda et al., 1995). However, in this sample, there was no significant interaction between adulthood and childhood trauma exposure. Perhaps for this population of older adults, the proximal nature of the adulthood trauma exposure versus the distal nature of childhood trauma exposure influenced this study's findings.

Emotion Regulation as a Mediator. This study tested for potential mediation by total expectation of negative mood regulation on the relationships between childhood victimization and negative affect, and childhood victimization and PTSD severity. Consistent with the study hypothesis, when examined without covariates, total expectation of negative mood was a mediator between childhood victimization and negative affect. However, after controlling for relevant covariates (gender and income), total expectation of negative mood did not mediate the relationship between childhood victimization and negative affect. This finding may potentially be influenced by gender differences as discussed above, or the salience of lower income for this sample of retirees. However, when testing for mediation between childhood victimization and PTSD severity, the total expectation of negative mood regulation did not mediate the relationship in models with and without covariates. Perhaps there are additional emotion regulation processes at work that may better account for the influence of childhood victimization on PTSD severity that are not being

assessed, or that total expectation of negative mood is not the mechanism underlying the bivariate relationship between childhood victimization and PTSD severity.

Limitations and Strengths

This study does have a few noteworthy limitations. First, the sample was comprised of a fairly ethnically homogeneous group of primarily male retired police officers and may not be generalizable to all police officers, ethnic groups, ages, or across genders. Second, the measures of trauma exposure assessed for the number of types of trauma exposures but did not specify the exact nature or severity of the trauma exposure. Thus, it is unclear which traumatic experiences were particularly distressing to participants and most linked to the distress measured. Third, the protocol did not include items more specific to determining protective factors; thus the study is unable to contribute to understanding why some individuals who experienced various forms of trauma exposure were resilient, while others were not. Finally, this study relies on self-report and retrospective data, and therefore may not be accurate.

However, there also are important strengths. First, we were able to model important covariates: adulthood victimization, adulthood trauma exposure, and other childhood trauma exposure. Second, this study included well-validated and accepted emotion, emotion regulation, and PTSD measures, strengthening inference about the specific effects of these categories of childhood violence exposure on adult outcomes. Third, these data fill a gap in our understanding of how multiple trauma exposures contribute to risk for emotion-related difficulties and PTSD, as well as emotion regulation difficulties. These data provide further information on the influence of indirect and direct trauma exposures by studying a

community sample from a population with known numerous trauma experiences, rather than a clinical sample.

Directions for Future Research

From these survey data, we were not able to learn how different forms of childhood victimization may lead to different outcomes, and why other adulthood trauma exposure was differentially related with PTSD outcomes. Qualitative studies with adult survivors of various forms of childhood and adulthood trauma might advance our understanding of the distinguishing characteristics of traumatic exposure that are most salient in influencing emotion-related processes and PTSD outcomes. Future research should extend this analysis to study women and younger adults so that patterns can be determined which are gender-specific or age-specific. Potential contributors to resilience from the psychiatric sequelae of childhood and adulthood trauma exposure should be included in future studies. Examples of such factors might include the presence of social support, personality characteristics, and mental health treatment for the child soon after the exposure(s).

Clinical Implications

The present study suggests that adults with a history of childhood victimization may need clinical interventions that specifically target emotion regulation strategies. Additionally, clinical assessment and treatment planning with individuals with trauma histories may benefit from assessing trauma exposure across lifespan and types (e.g., domestic violence, war, or motor vehicle accidents). History-taking that uses a framework eliciting additive experiences may be more informative. These data particularly point to the contribution of multiple non-

abuse lifetime exposures to the development and persistence of PTSD among childhood victimization survivors.

References

Aber, J. L., Allen, J. P., Carlson, V., & Cicchetti, D. (1989). The effects of maltreatment on development during early childhood: Recent studies and their theoretical, clinical, and policy implications. In D. Cicchetti, & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect.* (pp. 579-619). New York, NY, US: Cambridge University Press.

American Psychiatric Association (2000). Diagnostic and statistical manual of mental disorders (Rev. 4th ed.). Washington, DC.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51, 1173-1182.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*(5), 748-766.

Browne, A. & Finkelhor, D. (1986). Impact of child sexual abuse: A review of the research. Psychological Bulletin, *99*, 66–77.

Bugental, D. B., Blue, J., & Lewis, J. (1990). Caregiver beliefs and dysphoric affect directed to difficult children. *Developmental Psychology, 26*(4), 631-638.

Catanzaro, S. J., & Mearns, J. (1990). Measuring generalized expectancies for negative mood regulation: Initial scale development and implications. *Journal of Personality Assessment, 54*(3), 546-563.

Cicchetti, D., & Lynch, M. (1995). Failures in the expectable environment and their impact on individual development: The case of child maltreatment. In D. Cicchetti, & D. J. Cohen (Eds.), *Developmental psychopathology, vol. 2: Risk, disorder, and adaptation.* (pp. 32-71). Oxford, England: John Wiley & Sons.

Cloitre, M., Miranda, R., Stovall-McClough, K. C., & Han, H. (2005). Beyond PTSD: Emotion regulation and interpersonal problems as predictors of functional impairment in survivors of childhood abuse. *Behavior Therapy, 36*(2), 119-124.

During, S. M., & McMahon, R. J. (1991). Recognition of emotional facial expressions by abusive mothers and their children. *Journal of Clinical Child Psychology, 20*(2), 132-139.

Egloff, B., Schmukle, S. C., Burns, L. R., & Schwerdtfeger, A. (2006). Spontaneous emotion regulation during evaluated speaking tasks: Associations with negative affect, anxiety expression, memory, and physiological responding. *Emotion, 6*(3), 356-366.

Garber, J., & Dodge, K. A. (1991). *The development of emotion regulation and dysregulation*. New York, NY, US: Cambridge University Press.

Garnefski, N., Van Den Kommer, T., Kraaij, V., Teerds, J., Legerstee, J., & Onstein, E. (2002). The relationship between cognitive emotion regulation strategies and emotional

problems: Comparison between a clinical and a non-clinical sample. *European Journal of Personality, 16*(5), 403-420.

Graham-Bermann, S. A. (1996). Family worries: Assessment of interpersonal anxiety in children from violent and nonviolent families. *Journal of Clinical Child Psychology, 25*(3), 280-287.

Graham-Bermann, S. & Seng, J. (2005). Violence exposure and traumatic stress symptoms as additional predictors of health problems in high-risk children. *The Journal of Pediatrics, 146*(3), 349.

Green, M. W., Rogers, P. J., & Hedderley, D. (1996). The time course of mood-induced decrements in colour-naming of threat-related words. *Current Psychology: Developmental, Learning, Personality, Social, 14*(4), 350-358.

Gross, J. J. (1998a). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*(1), 224-237.

Gross, J. J. (1998b). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271-299.

Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current Directions in Psychological Science, 10*(6), 214-219.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348-362.

Gross, J. J., & Muñoz, R. F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science and Practice, 2*(2), 151-164.

Herrenkohl, R., Herrenkohl, E., Egolf, B., & Wu, P. (1991) The developmental consequences of child abuse: The Lehigh Longitudinal Study. *In R. H.* Starr, Raymond, Jr. & D.A. Wolfe (Eds), *The effects of child abuse and neglect: Issues and research* (pp. 57-81). New York, NY, US: Guilford Press.

Hetzel, M. D., & McCanne, T. R. (2005). The roles of peritraumatic dissociation, child physical abuse, and child sexual abuse in the development of posttraumatic stress disorder and adult victimization. *Child Abuse & Neglect, 29*(8), 915-930.

Johnson, H., & Thompson, A. (2008). The development and maintenance of post-traumatic stress disorder (PTSD) in civilian adult survivors of war trauma and torture: A review. *Clinical Psychology Review, 28*(1), 36-47.

Katz, C. L., Pellegrino, L., Pandya, A., Ng, A., & DeLisi, L. E. (2002). Research on psychiatric outcomes and interventions subsequent to disasters: A review of the literature. *Psychiatry Research, 110*(3), 201-217.

Kaufman, J., & Cicchetti, D. (1989). Effects of maltreatment on school-age children's socioemotional development: Assessments in a day-camp setting. *Developmental Psychology, 25*(4), 516-524.

Keane, T., Caddell, J., & Taylor, K. (1988, February). Mississippi Scale for Combat-Related Posttraumatic Stress Disorder: Three studies in reliability and validity. *Journal of Consulting and Clinical Psychology*, *56*(1), 85-90.

Kessler, R. C., Davis, C. G., & Kendler, K. S. (1997). Childhood adversity and adult psychiatric disorder in the US national comorbidity survey. *Psychological Medicine, 27*, 1101-1119.

Kilpatrick, D. G., Ruggiero, K. J., Acierno, R., Saunders, B. E., Resnick, H. S., & Best, C. L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: Results from the national survey of adolescents. *Journal of Consulting and Clinical Psychology, 71*(4), 692-700.

Klimes-Dougan, B., & Kistner, J. (1990). Physically abused preschoolers' responses to peers' distress. *Developmental Psychology, 26*(4), 599-602.

Kring, A. M., & Werner, K. H. (2004). Emotion regulation and psychopathology. In P. Philippot, & R. S. Feldman (Eds.), *The regulation of emotion.* (pp. 359-385). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Lansford, J. E., Malone, P. S., Stevens, K. I., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2006). Developmental trajectories of externalizing and internalizing behaviors: Factors underlying resilience in physically abused children. *Development and Psychopathology, 18*(1), 35-55.

Lenox, M. C., & Gannon, L. R. (1983). Psychological consequences of rape and variables influencing recovery: A review. *Women & Therapy, 2*(1), 37-49.

Liberman, A., Best, S. R., & Metzler, T. J. (2002). Routine occupational stress and psychological distress in police. *Policing.Intl.J.Police Strat.Mngt., 25*, 421-439.

Turner, R., & Lloyd, D. (1995, December). Lifetime traumas and mental health: The significance of cumulative adversity. *Journal of Health and Social Behavior*, *36*(4), 360-376.

MacMillan, K. M., & Harpur, L. L. (2003). An examination of children exposed to marital violence accessing a treatment intervention. *Journal of Emotional Abuse, 3*(3), 227-252.

Malatesta, C. Z., & Haviland, J. M. (1982). Learning display rules: The socialization of emotion expression in infancy. *Child Development, 53*(4), 991-1003.

Masten, C. L., Guyer, A. E., Hodgdon, H. B., McClure, E. B., Charney, D. S., Ernst, M., et al. (2008). Recognition of facial emotions among maltreated children with high rates of post-traumatic stress disorder. *Child Abuse & Neglect, 32*(1), 139-153.

Maughan, A., & Cicchetti, D. (2002). Impact of child maltreatment and interadult violence on children's emotion regulation abilities and socioemotional adjustment. *Child Development, 73*(5), 1525-1542.

McLean, L. M., Toner, B., Jackson, J., Desrocher, M., & Stuckless, N. (2006). The relationship between childhood sexual abuse, complex post-traumatic stress disorder and alexithymia in two outpatient samples examination of women treated in community and institutional clinics. *Journal of Child Sexual Abuse, 15*(3), 1-17.

Mennin, D. S., Heimberg, R. G., Turk, C. L., & Fresco, D. M. (2005). Preliminary evidence for an emotion dysregulation model of generalized anxiety disorder. *Behaviour Research and Therapy, 43*(10), 1281-1310.

Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social Development, 16*(2), 361-388.

Morrow, J., & Nolen-Hoeksema, S. (1990, March). Effects of responses to depression on the remediation of depressive affect. *Journal of Personality and Social Psychology*, *58*(3), 519-527.

Parker, G., Hadzi-Pavlovic, D., Brodaty, H., & Boyce, P. (1992). Predicting the course of melancholic and nonmelancholic depression: A naturalistic comparison study. *Journal of Nervous and Mental Disease, 180*(11), 693-702.

Pine, D. S., Costello, J., & Masten, A. (2005). Trauma, proximity, and developmental psychopathology: The effects of war and terrorism on children. *Neuropsychopharmacology, 30*(10), 1781-1792.

Pole, N., Best, S. R., Weiss, D. S., Metzler, T., Liberman, A. M., Fagan, J., et al. (2001). Effects of gender and ethnicity on duty-related posttraumatic stress symptoms among urban police officers. *Journal of Nervous and Mental Disease, 189*(7), 442-448.

Rottenberg, J., Kasch, K. L., Gross, J. J., & Gotlib, I. H. (2002). Sadness and amusement reactivity differentially predict concurrent and prospective functioning in major depressive disorder. *Emotion, 2*(2), 135-146.

Rude, S. S., & McCarthy, C. T. (2003). Emotional functioning in depressed and depression-vulnerable college students. *Cognition & Emotion, 17*(5), 799-806.

Salters-Pedneault, K., Roemer, L., Tull, M. T., Rucker, L., & Mennin, D. S. (2006). Evidence of broad deficits in emotion regulation associated with chronic worry and generalized anxiety disorder. *Cognitive Therapy and Research, 30*(4), 469-480.

Salzinger, S., Feldman, R. S., Hammer, M., & Rosario, M. (1991). Risk for physical child abuse and the personal consequences for its victims. *Criminal Justice and Behavior, 18*(1), 64-81.

Shields, A., Ryan, R. M., & Cicchetti, D. (2001). Narrative representations of caregivers and emotion dysregulation as predictors of maltreated children's rejection by peers. *Developmental Psychology, 37*(3), 321-337.

Shipman, K. L., Schneider, R., Fitzgerald, M. M., Sims, C., Swisher, L., & Edwards, A. (2007). Maternal emotion socialization in maltreating and non-maltreating families: Implications for children's emotion regulation. *Social Development, 16*(2), 268-285.

Shipman, K., Zeman, J., Penza, S., & Champion, K. (2000). Emotion management skills in sexually maltreated and nonmaltreated girls: A developmental psychopathology perspective. *Development and Psychopathology, 12*(1), 47-62.

Shonk, S. M., & Cicchetti, D. (2001). Maltreatment, competency deficits, and risk for academic and behavioral maladjustment. *Developmental Psychology, 37*(1), 3-17.

Silk, J. S., Shaw, D. S., Skuban, E. M., Oland, A. A., & Kovacs, M. (2006). Emotion regulation strategies in offspring of childhood-onset depressed mothers. *Journal of Child Psychology and Psychiatry, 47*(1), 69-78.

Simon, R., & Nath, L. (2004, March). Gender and Emotion in the United States: Do Men and Women Differ in Self-Reports of Feelings and Expressive Behavior? *American Journal of Sociology*, *109*(5), 1137-1176.

Stafford, B., Zeanah, C. H., & Scheeringa, M. (2003). Exploring psychopathology in early childhood: PTSD and attachment disorders in DC: 0-3 and DSM-IV. *Infant Mental Health Journal, 24*(4), 398-409.

Stimpson, N. J., Thomas, H. V., Weightman, A. L., Dunstan, F., & Lewis, G. (2003). Psychiatric disorder in veterans of the persian gulf war of 1991: Systematic review. *British Journal of Psychiatry, 182*(5), 391-403.

Tsai, J.L., Pole, N., Levenson, R.W., & Munoz, R.F. (2003). The effects of depression on the emotional responses of Spanish-speaking Latinas. Cultural Diversity and Ethnic Minority Psychology, 9, 49-63.

Tull, M. T., Barrett, H. M., McMillan, E. S., & Roemer, L. (2007). A preliminary investigation of the relationship between emotion regulation difficulties and posttraumatic stress symptoms. *Behavior Therapy, 38*(3), 303-313.

Tull, M. T., Jakupcak, M., McFadden, M. E., & Roemer, L. (2007). The role of negative affect intensity and the fear of emotions in posttraumatic stress symptom severity among victims of childhood interpersonal violence. *Journal of Nervous and Mental Disease, 195*(7), 580-587.

Tugade, M.M. & Fredrickson, B.L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology*, 86, 320-333.

U.S. Department of Health and Human Services, Administration on Children, Youth and Families. (2005). Child maltreatment 2003. Washington, DC: U.S. Government Printing Office.

van der Kolk,Bessel A. (1996). The complexity of adaptation to trauma: Self-regulation, stimulus discrimination, and characterological development. In van der Kolk,Bessel A., A. C. McFarlane & L. Weisaeth (Eds.), *Traumatic stress: The effects of overwhelming experience on mind, body, and society.* (pp. 182-213). New York, NY, US: Guilford Press.

Waller, E., & Scheidt, C. E. (2006). Somatoform disorders as disorders of affect regulation: A development perspective. *International Review of Psychiatry, 18*(1), 13-24.

Wastell, C. A. (2002). Exposure to trauma: The long-term effects of suppressing emotional reactions. *Journal of Nervous and Mental Disease, 190*(12), 839-845.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070.

Weiss, D. S., Brunet, A., Metzler, T., Best, S. R., Fagan, J., & Marmar, C. R. (1999). Critical incident exposure in police officers: Frequency, impact, and correlates. *Paper presented at the meeting of the international society for traumatic stress studies*, Northbrook, Illinois.

Weiss, D., Brunet A., Pole N., Metzler T.J., Liberman A., Fagan J.A., et al. (2005) The Critical Incident History Questionnaire: A method for measuring total cumulative exposure to critical incidents in police officers. Manuscript submitted for publication.

Widom, C. S. (1999). Posttraumatic stress disorder in abused and neglected children grown up. *American Journal of Psychiatry, 156*(8), 1223-1229.

Wolfsdorf, B. A., & Zlotnick, C. (2001). Affect management in group therapy for women with posttraumatic stress disorder and histories of childhood sexual abuse. *Journal of Clinical Psychology, 57*(2), 169-181.

Yehuda, R. (1999). Parental PTSD as a risk factor for PTSD. *Risk factors for posttraumatic stress disorder* (pp. 93-123). Washington, DC US: American Psychiatric Association.

Yen, S., Zlotnick, C., & Costello, E. (2002). Affect regulation in women with borderline personality disorder traits. *Journal of Nervous and Mental Disease, 190*(10), 693-696.

Zlotnick, C., Mattia, J. I., & Zimmerman, M. (2001). The relationship between posttraumatic stress disorder, childhood trauma and alexithymia in an outpatient sample. *Journal of Traumatic Stress, 14*(1), 177-188.

Table 2-1.
Background Variables for Entire Sample and Groups.

Variable	Overall Sample N=142 M (SD) or N(%)
Demographics	
Age	59.58 (8.17)
Education	14.89 (2.36)
Income	67.18 (26.02)
Married	119 (83.8%)
Police Service Years	24.68 (8.04)
Military Service	67 (47.18%)
Gender	
Male	131 (92.3%)
Female	11 (7.7%)
Ethnicity	
Caucasian	136 (95.8%)
Minority	5 (3.5%)
Trauma	
Other Child Trauma (Types)	0.42 (1.02)
Adult Trauma (Types)	2.80 (2.47)
Police Duty-Related Traumatic Incidents	277.80 (196.78)

Note. One participant did not report his ethnicity. Married coded: 0 = Married and 1 = Not married. Military service coded: 0 = no military service and 1 = military service.

*p < 0.05 ***p < 0.01 ***p < 0.001

Table 2-2.
Intercorrelations Between Primary Predictor Variables, Demographics, Outcome Variables, and Childhood Victimization (N = 142).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Childhood Victimization	-																
2. Adulthood Victimization	.07	-															
3. Childhood Other Trauma	.44***	.06	-														
4. Adulthood Other Trauma	.12	.59***	.05	-													
5. Mississippi PTSD	.30***	.20*	.11	.23**	-												
6. ERQ Reappraisal	-.01	.08	.07	.16	.06	-											
7. ERQ Suppression	.02	-.02	-.05	-.02	.18*	.22**	-										
8. NMR Total	-.24**	.01	-.04	.06	-.49***	.25**	-.12	-									
9. 10-item Positive Affect	-.06	.03	.08	.04	-.34***	.16	-.21*	.59***	-								
10. 10-item Negative affect	.07	.10	-.02	-.03	.47***	-.08	.12	-.49***	-.36***	-							
11. 9- new Positive Affect	-.13	.04	.04	.05	-.39***	.20*	-.14	.63***	.84***	-.46***	-						

12. 9-new Negative Affect	.19*	.15	.02	.02	.50***	-.09	.08	-.55***	-.47***	.86***	-.56***	-				
13. Age	-.23**	-.05	-.25**	-.13	-.24**	-.07	-.02	.08	-.02	-.22*	.08	-.14	-			
14. Gender	.31***	.08	.01	-.18*	.21*	.02	.06	-.17*	-0.07	.23**	-.11	.32***	-.21*	-		
15. Years of Police Service	-.12	.01	-.09	.14	-.32***	-.02	-.05	.20*	.04	-.19*	.05	-.14	.25**	-.24**	-	
16. Income	.04	.05	.05	.10	-.18*	.04	-.02	.17*	.10	-.16	.11	-.21*	-.25**	-.14	.27**	-
17. Education	-.01	.13	.00	.25**	-.05	.14	-.18*	.21*	.28**	-.09	.20*	-.06	-.08	-.08	.08	.13	-

Note. Gender was coded: 1 = male and 2 = female. Due to space constraints, marital status, minority status, and military service were excluded from the correlation matrix; they were not significantly related to the primary predictor variables or outcome variables.

**p < 0.05 **p < 0.01 ***p < 0.001*

Table 2-3.

Linear Regression Models Predicting PTSD, Negative Affect, and Emotion Regulation after Controlling for Potential Covariates (N = 142).

Step	Explanatory Variables	B	SE B	β	*p*	R^2	*Adj* R^2	ΔR^2	F
Predicting Negative Affect (PANAS)									
Step 1						0.13	0.12	0.13	10.28***
	Gender	0.93	0.26	0.29	<.001				
	Income	-0.01	0.00	-0.17	.033				
Step 2						0.14	0.12	0.01	7.59***
	Gender	0.81	0.27	0.25	.003				
	Income	-0.01	0.00	-0.18	.024				
	Childhood Victimization	0.12	0.08	0.12	.154				
Predicting Emotion Regulation (NMR Total Scale)									
Step 1						0.10	0.07	0.10	3.77**
	Gender	-0.65	0.51	-0.11	.201				
	Years of Police Service	0.03	0.02	0.14	.111				
	Income	0.01	0.01	0.10	.252				
	Education	0.12	0.06	0.17	.036				
Step 2						0.14	0.11	0.04	4.47**
	Gender	-0.25	0.52	-0.04	.632				
	Years of Police Service	0.02	0.02	0.12	.153				
	Income	0.01	0.01	0.12	.154				
	Education	0.12	0.06	0.18	.030				

	Childhood Victimization	-0.40	0.15	-0.22	.011				
Predicting PTSD (Mississippi PTSD Scale)									
Step 1						0.14	0.11	0.14	5.36***
	Age	-0.63	0.26	-0.22	.016				
	Gender	4.88	7.76	0.05	.531				
	Years of Police Service	-0.55	0.26	-0.18	.039				
	Income	-0.14	0.08	-0.15	.084				
Step 2						.232	.198	.095	6.70***
	Age	-0.46	0.25	-0.16	.073				
	Gender	9.06	7.77	0.10	.246				
	Years of Police Service	-0.68	0.25	-0.23	.009				
	Income	-0.14	0.08	-0.15	.075				
	Adulthood Victimization	0.85	1.53	0.05	.577				
	Other Adulthood Trauma	4.42	1.58	0.28	.006				
Step 3						.248	.208	.016	6.22***
	Age	-0.41	0.25	-0.14	.107				
	Gender	6.38	7.88	0.07	.420				
	Years of Police Service	-0.64	0.25	-0.22	.012				
	Income	-0.15	0.08	-0.16	.055				
	Adulthood Victimization	0.95	1.52	0.06	.534				

Other Adulthood Trauma	3.98	1.59	0.25	.014
Childhood Victimization	4.00	2.39	0.13	.097

Note. Gender was coded: 1 = male and 2 = female.

$^{*}p < 0.05$ $^{**}p < 0.01$ $^{***}p < 0.001$

Table 2-4.

Mediation Analyses Predicting Negative Affect with and without Potential Covariates (N = 142).

		PANAS Negative Affect							
Step	Explanatory Variables	B	SEB	β	*p*	R^2	*Adj* R^2	ΔR^2	F
Simple Mediation Model									
						.036	.029	.036	5.26**
Step 1									
	Childhood Victimization	0.18	0.08	0.19	0.02				
						.301	.290	.264	29.86***
Step 2									
	Childhood Victimization	0.06	0.07	0.06	0.40				
	NMR Total (emotion regulation)	-0.28	0.04	-0.53	<.001				
Mediation Model with Potential Covariates									
						0.13	0.12	0.13	10.28***
Step 1									
	Gender	0.93	0.26	0.29	<.001				
	Income	-0.01	0.00	-0.17	0.03				
						0.14	0.12	0.01	7.59***
Step 2									
	Gender	0.81	0.27	0.25	0.003				
	Income	-0.01	0.00	-0.18	0.02				

Childhood Victimization	0.12	0.08	0.12	0.15				
					0.36	0.34	0.22	19.09***
Step 3								
Gender	0.69	0.23	0.22	.004				
Income	0.00	0.00	-0.10	.163				
Childhood Victimization	0.01	0.07	0.01	.902				
NMR Total (emotion regulation)	-0.26	0.04	-0.49	<.001				

Note. Gender was coded: 1 = male and 2 = female.
**p < 0.05 **p < 0.01 ***p < 0.001*

Table 2-5.

Mediation Analyses Predicting PTSD with and without Potential Covariates (N = 142).

		Mississippi PTSD Scale							
Step	Explanatory Variables	B	SEB	β	*p*	R^2	*Adj* R^2	ΔR^2	F
Simple Mediation Model									
Step 1						0.09	0.08	0.09	13.56***
	Childhood Victimization	8.37	2.27	0.30	<.001				
Step 2						0.27	0.26	0.18	25.90***
	Childhood Victimization	5.37	2.10	0.19	.012				
	NMR Total (emotion regulation)	-6.76	1.14	-0.44	<.001				
Mediation Model with Potential Covariates									
Step 1						0.14	0.11	0.14	5.36***
	Age	-0.63	0.26	-0.22	.016				
	Gender	4.88	7.76	0.05	.531				
	Years of Police Service	-0.55	0.26	-0.18	.039				
	Income	-0.14	0.08	-0.15	.084				
Step 2						.232	.198	.095	6.70***
	Age	-0.46	0.25	-0.16	.073				
	Gender	9.06	7.77	0.10	.246				
	Years of Police Service	-0.68	0.25	-0.23	.009				
	Income	-0.14	0.08	-0.15	.075				
	Adulthood Victimization	0.85	1.53	0.05	.577				

	Adult Other Trauma	4.42	1.58	0.28	.006				
Step 3						.248	.208	.016	6.22***
	Age	-0.41	0.25	-0.14	.107				
	Gender	6.38	7.88	0.07	.420				
	Years of Police Service	-0.64	0.25	-0.22	.012				
	Income	-0.15	0.08	-0.16	.055				
	Adulthood Victimization	0.95	1.52	0.06	.534				
	Adult Other Trauma	3.98	1.59	0.25	.014				
	Childhood Victimization	4.00	2.39	0.13	.097				
Step 4						0.39	0.35	0.14	10.50***
	Age	-0.41	0.25	-0.14	.107				
	Gender	6.38	7.88	0.07	.420				
	Years of Police Service	-0.64	0.25	-0.22	.012				
	Income	-0.15	0.08	-0.16	.055				
	Adulthood Victimization	0.95	1.52	0.06	.534				
	Other Adulthood Trauma	3.98	1.59	0.25	.014				
	Childhood Victimization	4.00	2.39	0.13	.097				
	NMR Total (emotion regulation)	-5.92	1.06	-0.39	<0.001				

Note. Gender was coded: 1 = male and 2 = female.

**p < 0.05 **p < 0.01 ***p < 0.001*

Table 2-6.
Moderator Analyses Predicting Negative Affect, Emotion Regulation, and PTSD (N = 142).

		Mississippi PTSD Scale							
Step	Explanatory Variables	B	SEB	β	*p*	R^2	$Adj\ R^2$	ΔR^2	F
Model A. Simple Moderator Model									
Step 1						0.06	0.05	0.06	4.44*
	Adulthood Victimization	1.46	1.67	0.09	.384				
	Adult Other Trauma	2.99	1.67	0.18	.075				
Step 2						0.13	0.11	0.07	7.08***
	Adulthood Victimization	1.45	1.61	0.09	.368				
	Other Adulthood Trauma	2.46	1.62	0.15	.131				
	Childhood Victimization	7.68	2.25	0.27	.001				
Step 3						0.15	0.12	0.02	4.88***
	Adulthood Victimization	2.14	1.70	0.13	.212				
	Other Adulthood Trauma	2.25	1.64	0.14	.173				
	Childhood Victimization	8.12	2.26	0.29	.000				
	Adult Victimization X Childhood Victimization	-0.86	1.89	-0.04	.649				
	Other Adulthood Trauma X Childhood Victimization	-2.09	1.92	-0.11	.276				
Model B: Model with Potential Covariates									
Step 1						0.14	0.11	0.14	5.36***
	Age	-0.63	0.26	-0.22	.016				
	Gender	4.88	7.76	0.05	.531				

	Years of Police Service	-0.55	0.26	-0.18	.039			
	Income	-0.14	0.08	-0.15	.084			
Step 2						0.23	0.20	0.10	6.70***
	Age	-0.46	0.25	-0.16	.073			
	Gender	9.06	7.77	0.10	.246			
	Years of Police Service	-0.68	0.25	-0.23	.009			
	Income	-0.14	0.08	-0.15	.075			
	Adulthood Victimization	0.85	1.53	0.05	.577			
	Other Adulthood Trauma	4.42	1.58	0.28	.006			
Step 3						0.25	0.21	0.02	6.22***
	Age	-0.41	0.25	-0.14	.107			
	Gender	6.38	7.88	0.07	.420			
	Years of Police Service	-0.64	0.25	-0.22	.012			
	Income	-0.15	0.08	-0.16	.055			
	Adulthood Victimization	0.95	1.52	0.06	.534			
	Other Adulthood Trauma	3.98	1.59	0.25	.014			
	Childhood Victimization	4.00	2.39	0.13	.097			
Step 4						0.25	0.20	0.00	4.85***
	Age	-0.44	0.26	-0.15	.091			
	Gender	6.56	8.04	0.07	.416			
	Years of Police Service	-0.66	0.26	-0.22	.014			
	Income	-0.15	0.08	-0.16	.057			
	Adulthood Victimization	1.23	1.64	0.08	.455			
	Other Adulthood Trauma	3.78	1.65	0.24	.024			
	Childhood Victimization	3.83	2.64	0.13	.149			
	Adult Victimization X Childhood Victimization	1.29	1.83	0.07	.483			

Other Adulthood Trauma X Childhood Victimization	-1.04	1.83	-0.06	.573

Note. Gender was coded: 1 = male and 2 = female.
*$*p < 0.05$ **$p < 0.01$ ***$p < 0.001$*

Chapter 3

Childhood Victimization, PTSD, and Respiratory Sinus Arhythmia: A Study of Retired Police Officers

Childhood victimization, such as physical, sexual, and emotional abuse, is potentially traumatic and is a known risk factor for the development of several adverse mental health sequelae in childhood and adulthood, particularly PTSD (e.g., Kilpatrick et al., 2003). Children with PTSD show altered psychobiology (e.g., for review articles, see De Bellis, 2001, 2005; Watts-English, Forsten, Gibler, Hooper, & DeBellis, 2006) and a myriad of emotional difficulties, such as significantly less positive emotion (e.g., Bugental, Blue, & Lewis, 1990) and more negative emotion (e.g., Graham-Bermann, 1996; Herrenkohl, Herrenkohl, Egolf, & Wu, 1991); atypical processing of emotion, such as heightened ability to identify fearful faces (e.g., Masten, et al., 2008); and difficulty distinguishing between emotions (During & McMahon, 1991; Klimes-Dougan & Kistner, 1990).

Moreover, cross-sectional studies suggest that many of these emotional difficulties exist among adult survivors of childhood victimization. These adult survivors show problems with an increased frequency and intensity of negative emotions (e.g., Briere & Runtz, 1990; Tull, Jakupcak, McFadden, & Roemer, 2007), and difficulty in expressing or feeling emotions (e.g., Hund & Espelage, 2006; McLean et al., 2006). These survivors are

also at increased risk for the development of PTSD (e.g., Brewin, Andrews, & Valentine, 2000; Hetzel & McCanne, 2005; Widom, 1999) and altered stress-related psychophysiology (e.g., Heim et al., 2002; Otte et al., 2005; Pole et al. , 2007). The persistent co-occurrence of emotion difficulties, increased prevalence of PTSD, and the altered-psychophysiology among these trauma survivors has led researchers to search for common mechanisms underlying these varied outcomes. One potential mediating mechanism is emotion regulation.

Emotion regulation as a Mediator

Emotion regulation (ER) is a set of inter-related psychological and physiological processes that modulate emotional experience, expression, and responses (Gross, 1998, 2001). Some clinical theorists argue that the hallmark symptoms of PTSD (e.g., increased irritability, emotional numbing, and heightened arousal) are emotion regulation-related (Frewen & Lanius, 2006; Kring & Werner, 2004). This contention is supported by preliminary clinical research that links ER difficulties to PTSD (McLean et al., 2006; Tull, Barrett, & McMillan, 2007; Zlotnick, Mattia, & Zimmerman, 2001).

While the child development research has not fully examined the relationship between ER and PTSD, it provides peripheral support for the contention that childhood victimization may contribute to emotion regulation deficits. Emotion regulation is argued to develop in childhood as caregivers initially provide external regulation for a child's emotions. Children are thought to internalize emotion regulation strategies that are modeled to them by their early environment, and eventually gain the competence to employ these strategies themselves (Malatesta & Haviland, 1982; Parker et al., 1992). Thus, disruptions in a child's early environment and relationships, and/or the absence of appropriate modeling, have a

significant impact on a child's emotion regulation (e.g., Morris, Silk, Steinberg, Myers, & Robinson, 2007; Garber & Dodge, 1991).

Previous research on childhood victimization and emotion regulation deficits has primarily focused on maltreated children. These child victims are reported to display emotion regulation difficulties in several ways, such as inappropriate emotional lability and affective displays, rigid responsiveness, inability to self modulate emotional arousal, greater negativity, and dysregulated negative affect (Shields, Ryan, & Cicchetti, 2001; Shipman et al., 2007; Shipman, Zeman, Penza, & Champion, 2000). Such emotion regulation difficulties in maltreated children were linked with difficulties in multiple domains, including socio-behavioral problems (e.g., starting fights and other disruptive behavior), mood problems (e.g., greater anxiety and more depressive symptoms), and increased risk for developing psychopathology (Maughan & Cicchetti, 2002; Shields, Ryan, & Cicchetti, 2001; Silk, Shaw, Skuban, Oland, & Kovacs, 2006).

A small but emerging literature evidenced the relationship between childhood victimization, emotion regulation difficulties, and adverse mental health outcomes in adult survivors (McLean et al., 2006; Paivio & Laurent, 2001; van der Kolk, 1996; Wolfsdorf & Zlotnick, 2001). Studies have focused on the link between early trauma and affect dysregulation, which has been operationalized in a variety of ways, including difficulties with affect modulation, unmodulated anger, self-destructiveness, suicidal behavior, and unmodulated sexual involvement (van der Kolk, 1996). McLean and colleagues (2006) reported that alterations in affect and impulse regulation were associated with dissociation, somatization, and alexithymia in their clinic-based outpatient sample of adult female childhood victimization survivors. However, questions about emotion regulation's potential

mediation of childhood victimization and the development of psychopathology (i.e., PTSD) have remained unanswered.

A few studies have examined the relationship between emotion regulation difficulties and PTSD with mixed findings. Cloitre, Miranda, Stovall-McClough, and Han (2005) examined the predictive contribution of emotion regulation and interpersonal problems on functional impairment among 164 treatment-seeking female survivors of child victimization (i.e., maltreatment). They did not find evidence that emotion regulation mediated trauma exposure and PTSD. Instead they found that emotion regulation was not significantly correlated to PTSD while both emotion regulation and PTSD were significantly correlated with greater functional impairment and interpersonal problems. Tull, Barrett, McMillan, and Roemer (2007) studied the relationship between emotion regulation difficulties and posttraumatic stress symptoms among ethnically diverse undergraduates and found that posttraumatic stress symptoms severity was related to overall emotion regulation difficulties. Specifically, posttraumatic stress symptoms were related to a lack of emotional acceptance, impulse-control difficulties, lack of emotional clarity, and limited access to effective emotion regulation techniques. In addition, individuals that met criteria for a PTSD diagnosis reported significantly more emotion regulation difficulties than those at sub-threshold levels.

Measuring Emotion Regulation

Because emotion regulation is a set of interrelated psychological and physiological processes, measures have been developed to capture its cognitive, behavioral, and physiological facets. Emotion regulation can be indexed with a physiological measure called respiratory sinus arhythmia (RSA). RSA, the alteration of heart rate due to breathing, is most closely associated with parasympathetic nervous system activity (Butler, Wilhelm, &

Gross, 2006). The parasympathetic nervous system, a branch of the autonomic nervous system, is responsible for the body's ability to down-regulate arousal and emotions. RSA is thought to be a good index of the parasympathetic nervous system's regulation of heart rate variability (Porges, 1991). Thus, RSA is a potential objective indicator of emotion regulation (Bernston, Cacioppo & Quigley, 1993; Grossman & Kollai, 1993). Current RSA research most often focuses on phasic RSA values (change scores) rather than tonic (mean levels) RSA values; phasic RSA reflects the difference in RSA during a given task (e.g., solving arithmetic problems) and the RSA at baseline while tonic RSA averages RSA over a given phase. Higher phasic RSA is thought to be associated with more adaptively controlled affective processes, calmer autonomic states, and quicker recoveries from stress. Research has found that high resting baseline RSA in adults is considered healthier as it is associated with physiological flexibility and predisposes individuals to emotional flexibility, and appropriate engagement with the physical and social environment (Beauchaine, 2001; Porges, 1995, Porges, Doussard-Roosevelt, & Maita, 1994; Thayer & Lane, 2000). Lower resting RSA levels are considered to reflect a diminished capacity to cope with stress, and lower RSA has been found associated with poor emotional adaptability and flexibility (Demaree, Robinson, Everhart, & Schmeichel, 2004; Thayer & Lane 2000), impaired social functioning, presence of psychopathology (e.g., depression; Rottenberg, Clift, Bolden, & Salomon, 2007), and parasuicidal behavior (Crowell et al., 2005). Table 1 briefly summarizes this previous research on RSA. RSA could be helpful in assessing the impact of child victimization exposure on a physiological correlate of emotion regulation, and specifically an index of the part of the nervous system thought to be so vital in moderating heightened arousal and emotion, the parasympathetic nervous system (PNS).

To date, prior studies on the impact of childhood trauma on emotion regulation and PTSD in adults have not utilized RSA. However, other previous research has shown that individuals with PTSD have abnormalities in RSA at resting baseline and in response to trauma reminders. A study on RSA among traumatized children reported that children with PTSD showed decreased RSA responses to trauma stimuli (Scheeringa, Zeanah, Myers, & Putnam, 2004). In a study of adults, Cohen et al. (1998) found that PTSD was associated with lower resting RSA and less RSA reactivity to trauma-related imagery. Sack and colleagues (2004) reported that when comparing the task of listening to a trauma-related script and listening to a neutral script, PTSD-positive adults showed lower RSA, increased heart rate, and more subjective distress. Lowered RSA coupled with increased heart rate is thought to suggest a potential failure of the PNS to down-regulate heightened arousal when exposed to trauma reminders. These findings for lowered RSA seem to appear specifically when individuals are confronted with trauma reminders. Prior research generally finds no change in RSA from the resting phase to a non-trauma related stress task phase among PTSD-positive individuals (Cohen et al., 1998), even when compared to trauma-exposed controls (Sahar, Shalev, & Porges, 2001). These findings are consistent with clinical research among PTSD-positive individuals on the unique response elicited by traumatic stress reminders, or cues (see Pole, 2007 for a meta-analytic review). Still, much remains unknown about the relationship between RSA and the specific influence of childhood victimization among adults.

Role of Adulthood Trauma Exposure

Prior research has not examined how childhood victimization and adulthood trauma exposure may influence RSA and PTSD outcome differently. In general, adulthood trauma

exposure has been well studied and found to have similar negative outcomes as those found in children, such as increased risk for the development of psychopathology and impairment, as evidenced by the extant rape-survivor, combat veteran, refugee, and disaster literatures (e.g., Johnson and Thompson, 2008; Katz, Pellegrino, Pandya, Ng, & DeLisi, 2002; Lenox & Gannon, 1983; Stimpson, Thomas, Weightman, Dunstan, & Lewis, 2003). There is a well-established link between early victimization and increased risk for later victimization (e.g., Banyard, Williams, & Siegel, 2001; Maker, Kemmelmeier, & Peterson, 2001).

However, when studying childhood victimization survivors, it is unclear whether the resulting emotional and psychiatric sequelae are related to child victimization exposure and/or adulthood trauma exposure. A closer examination of the relationships among childhood victimization, adulthood trauma exposure, PTSD, and emotion regulation difficulties in adulthood is warranted to ascertain if emotion-related difficulties are accounted for by recent trauma, early trauma, or a combination of both. The ability to differentiate between the outcomes due to adult and childhood trauma exposure may be particularly useful in clinical theory and practice in populations exposed to high levels of adulthood trauma exposure, such as veterans and police officers. Finally, while previous research examining childhood victimization and/or adulthood trauma exposure on adults, these trauma exposures have not been as well studied among older adults. This gap in the empirical literature results hinders our understanding of the potential distress that may result from these forms of trauma exposure and potential treatment needs of older individuals with complex trauma histories.

The Present Study

This study examines the relationships among childhood victimization, adulthood trauma exposure, adult physiological measures of emotion regulation (RSA), and PTSD severity among a group of retired police officers. In particular, it seeks to explore the influence of childhood victimization relative to adulthood trauma exposure on RSA and PTSD, and investigate whether RSA mediates the relationships between childhood victimization and PTSD. Given the multiple traumatic experiences that are likely to occur over the course of police work, this group affords the opportunity to examine the unique contribution of childhood victimization to the development of adulthood post-traumatic stress symptoms and adult RSA relative to the influence of more proximal adulthood trauma exposure. The main research questions and hypotheses that will be investigated are the following.

First, is childhood victimization related to PTSD severity and RSA? It was predicted that increased childhood victimization would be related to more PTSD severity and lower levels of phasic RSA (less reactivity). Second, does childhood victimization continue to predict PTSD after controlling for potential covariates/confounding factors (e.g., demographic and non-childhood victimization trauma exposure variables)? It was predicted that childhood victimization would continue to be positively related to predict PTSD severity and negatively related to RSA after controlling for potential covariates/confounds. Third, does childhood victimization moderate the relationship between adulthood trauma exposure and phasic RSA? It was hypothesized that childhood victimization would interact with adulthood trauma exposure, and thus have an additive effect on phasic RSA such that more childhood victimization and adulthood trauma exposure would be positively related to lower phasic RSA (less reactivity). Fourth, does RSA mediate the relationship between

childhood victimization exposure and PTSD severity. It was predicted that phasic RSA would mediate the relationship between childhood victimization and PTSD severity. Finally, after controlling for adulthood trauma exposure and other potential confounds, does RSA continue to mediate the relationship between childhood victimization and PTSD severity when entered together in a multivariate model? It was predicted that phasic RSA would continue to mediate childhood victimization and phasic RSA would be negatively related to PTSD severity.

Method

Participants and Sampling

This sample was initially composed of 49 retired police officers who had served in Michigan police departments. Participants were recruited through retired police organizations via professional newsletters to participate in an ongoing study of risk and resilience factors for post-retirement adjustment. They participated in the study between October 2004 and September 2006. Potential participants were pre-screened by telephone to ensure: (a) the presence of exposure to at least one critical incident of sufficient seriousness to meet *Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition* (DSM-IV; American Psychiatric Association, 2000) criterion A1 for posttraumatic stress disorder (American Psychiatric Association, 2000), (b) the absence of autonomically active medications (e.g., beta blockers), and (c) willingness to travel to Ann Arbor to complete the laboratory portion of the study. Due to incomplete or missing data, only 35 participants will be examined in the present study.

Psychometric Measures

Demographics. Participants reported on their age, gender, years of education, military history, years of police service, and marital status.

Non-duty Related Trauma History. This study used an adaptation of the 28-item *Trauma History Questionnaire* (THQ; Green, Rogers, & Hedderley, 1996) to assess lifetime exposure to non-duty related traumatic events (e.g., accidents, sexual assaults, muggings, disasters). For each item, respondents were asked whether a particular traumatic event occurred (yes/no). Participants were asked to indicate the earliest age at which each trauma occurred and the most recent age that the trauma occurred. Four trauma summary scores were calculated from these items. First, a childhood victimization-exposure score ("childhood victimization") was calculated by adding the THQ items that indicated the number of types of victimization-related traumatic events endorsed and reported to have occurred before age 18 (i.e., emotional abuse, direct experience of terrorist act or war; rape, sexual molestation, incest, or other unwanted sexual contact; physically attacked with or without a weapon; physical abuse, serious neglect, or being held captive/tortured/kidnapping). Second, an "other" childhood trauma exposure score ("other childhood trauma") was calculated by adding the THQ items that indicated the number of types of traumatic events reported to have occurred before age 18 in which the participant was not directly victimized (i.e., those items related to experiencing robbery, disaster, witnessing death/seeing dead body, serious illness, and confronted with serious injury). Third, an adulthood victimization score ("non-duty adulthood victimization") was calculated by summing the number of types of victimization-related traumatic events endorsed and reported to have occurred after the age of 18 (the same items referenced in the childhood victimization variable). Fourth, an adult non-victimization trauma score ("other non-duty adulthood trauma") was calculated by

summing the number of types of non-victimization traumatic events endorsed and reported to have occurred after the age of 18 (the same items referenced in the other childhood trauma variable).

Duty-related trauma was assessed using the *Critical Incident History Questionnaire* (CIHQ; Weiss et al., 2005), a measure that asks respondents how frequently they were exposed to each of 40 police-related "critical incidents" (e.g., being present when a fellow officer was killed, being shot at, making a mistake that led to the serious injury of a bystander). In the initial development of the measure, Weiss et al. (2005) found that the total score shows good test-retest reliability ($r = .63$). For the purposes of this study, this instrument was scored by adding the number of types of critical incidents experienced by the respondent to generate two scores: duty-related victimization and duty-related other trauma. Duty-related victimization is composed of duty-related incidents in which police officers were directly victimized by acts aggression or threat of aggression (i.e., injured intentionally, seriously beaten, threats to family due to police work, shot, taken hostage, threatened with weapons, having your life threatened by an aggressive dog, or managing a riot or aggressive crowd. Duty-related "other" trauma refers to other traumatic incidents that do not deal with direct victimization or aggression (e.g., being in a duty-related serious car accident or seeing a mutilated body).

The *Mississippi Scale—Civilian Version (MS–CV)* is a 40-item measure of cumulative PTSD-related symptoms adapted from the Mississippi Scale for Combat-Related Posttraumatic Stress Disorder (Keane, Caddell, & Taylor, 1988). Measure items were slightly revised in order to replace references to military service with the respondent's cumulative potentially traumatic experiences as a police officer. Each item was rated on a 5-point scale

from 1= "not at all true" to 5= "extremely true." The 40-item version of the MS–CV included previously missing *DSM–IV* PTSD symptoms in addition to the original 35 items. The measure was then scored by summing the 40 items (α = .93) which indexed the severity of all *DSM–IV* PTSD symptoms and assessed the severity of reexperiencing (α = .83), avoidance/numbing (α=.78), and hyperarousal symptoms (α = .76), plus associated features. The present study reported findings related to total scale score.

Physiological Measures

Psychophysiological measurement was accomplished with equipment and software designed by the James Long Company (JLC; Caroga Lake, NY) and with the data-acquisition program Snap-Master ™ for Windows. The system allowed for continuous collection of physiological data in the cardiac and respiratory domains. The physiological measures were digitized at 512 samples per second with a 31 channel analog to digital (A/D) converter operating at a resolution of 12 bits and having an input range of - 2.5 V to + 2.5 V. All physiological signals were sent to a James Long Systems bioamplifier (Model NP-10BA) and converted from A/D signals for offline data storage and analysis. The EEG/EMG bioamplifier had low-distortion, low-noise, hi 50/60~ rejection amplifiers and conformed to the AAMI/ANSI standard ES-1, 2.1 Electronic Medical Apparatus with Isolated Patient Connections. Amplification rates, high-pass filter (HPF), and low-pass filter (LPF) settings were as follows: electrocardiogram (ECG; gain = 500, HPF = 0.1 Hz, LPF = 500 Hz) and respiration (gain =individually adjusted, HPF =none/DC, LPF = 10Hz). The bioamplifier outputs were fully isolated from the signal source and could therefore be connected to AC grounded devices for data analysis.

Heart Rate (HR). HR is a measure of the activity of the heart. Heart rate is known to increase with sympathetic nervous system activation or parasympathetic nervous system withdrawal or both (Bernston, Cacioppo, & Quigley, 1993). After cleaning target skin areas with nuPrep and allowing them to dry, James Long Company ECG leads were placed on the left and right forearms to continuously record the ECG from which heart rate in beats per minute was derived using James Long Company custom software. The pair of loose-lead surface electrodes had shrouded jacks for connection, and were attached using proper electrode paste and technique. The millivolt signal from the heart was amplified by a precision differential amplifier with ~106dB of 50/60 Hz noise-rejection.

Respiration. Both *respiration period (RP*), i.e., the time between breaths and *tidal volume (TV),* i.e., the breathing depth were measured. Respiration tends to quicken and become shallower during states of anxiety and fear, though tidal volume may increase in fear states as well (Fried, 1994). Both parameters were measured through a 1/8 inch connection to a pneumograph respiration belt, which was fitted snugly around the rib cage of the participant. The contraction and expansion of the belt were measured during inhalation (the belts expands) and exhalation (the belt contracts). Inspiration produced a positive output while expiration produces a negative output. The bandpass was DC-10 Hz with an output range of +/-2.5 V.

Respiratory Sinus Arhythmia (RSA). RSA is the occurrence of cyclic fluctuations in heart rate that correspond with phase of respiration (Grossman, 1983). RSA is influenced by respiration rate and depth (Berntson et al., 1993; Grossman & Kollai, 1993; Grossman, Stemmler, & Meinhardt, 1990; Houtveen, Rietveld, & De Geus, 2002). RSA was calculated by the James Long software following methods outlined by Grossman (1983). This method

involves computing the difference between the minimum cardiac interbeat interval (IBI) during inspiration and the maximum IBI during expiration. This is done twice for each respiration cycle and a midpoint is determined for each inspiration and expiration, which serves as the final RSA for each. By synchronizing with respiration, this RSA value is relatively uninfluenced by other sources of cardiac arrhythmia such as baroreceptors, thermoregulation, and tonic shifts in heart rate. We analyzed RSA during the multiple phases of the video presentation. Phasic RSA, or change in RSA for each segment of the critical incident video, was calculated by subtracting the mean RSA during each phase from the mean baseline RSA. Given the prior research on the importance of adjusting for the influence of respiration (e.g., Grossman, Karemaker, and Wieling, 1991), corrected RSA scores were computed by calculating the residual score of the regression analysis of tidal volume predicting the corresponding RSA volume. The resulting unstandardized residuals were used as the corrected RSA score. All analyses were conducted using these corrected phasic RSA values.

Laboratory Procedure

Overview. Eligible participants gave written, informed consent and were sent a lengthy questionnaire packet to be completed at home that included the self-report psychological measures. Within two weeks, these participants were scheduled to visit the Pole PTSD Lab in the Department of Psychology at the University of Michigan, Ann Arbor to participate in a procedure that lasted approximately 4 hours. Non-invasive physiological sensors were attached (e.g., taped onto the participant) to measure the parameters described above. Participants engaged in: (1) a resting baseline, (2) a trauma interview, and (3) watching duty-

related critical incident video (described in detail below). After completing both the questionnaire and the lab procedure, participants received $100.

Beginning the study. Participants were welcomed to the lab, and informed consent was given. After participants washed their hands, the experimenters explained that they were going to attach sensors that allowed the measurement of physiological responses to the experiment. Participants were asked to remove their watches and rings if applicable, prior to having their skin prepared for electrode placement using a mildly abrasive gel.

Resting Baseline. Seven minutes of resting baseline physiological data were collected. During the first five minutes, participants were seated in a chair and asked to look at a sign with the word "Relax" and were given the instruction to relax. Participants were also told that they should blink normally but not close their eyes for extended periods of time. Participants were asked to empty their minds of all thoughts and worries and not to move or talk during this period. At the end of the five minutes, the interviewer entered the room and spoke to the participants about relatively neutral subject matter (e.g., the weather) so that baseline talking data could be collected.

Trauma Interview. All participants were interviewed by a Michigan-state licensed clinical psychologist. Retirees were asked to vividly re-imagine their most disturbing duty-related traumatic event for five minutes, describe the incident, and then to respond to questions regarding past and present PTSD symptoms in the semi-structured *Clinician Administered PTSD Scale (CAPS) Interview*. This task is thought to elicit an idiographic associative network of trauma-related responses including psychophysiological responding (Pole, 2005). For participants with elevated PTSD symptoms, these responses should be unusually intense. As such, it may yield one of the most robust psychophysiological

correlates of PTSD (e.g., Keane et al., 1998; Pole, 2007). We collected data during the thinking phase, which was prior to the start of this interview.

Critical Incident Video. Retirees watched a 15 minute videotape composed of five minutes of neutral travel scenes, five minutes of police-related critical incidents involving actual death or serious injury, and five additional minutes of neutral scenes. This critical incident video was composed of the following scenes: a decapitated body in dumpster scene (clip 1, 304 - 350 seconds), a drunk driver scene (clip 2, 350 - 388 seconds), a discovery dead boy scene (clip 3, 388 - 405 seconds), hit and run scene (clip 4, 405 - 443 seconds), a severed head scene (clip 5, 443 - 490 seconds), a scene of an animal control officer being attacked by a dog (clip 6, 490 - 537 seconds), and a nurse being stabbing scene (clip 7, 537 - 603 seconds). This video has been used in several studies of police stress conducted by Dr. Pole and his collaborators (Otte et al., 2005). During this task, participants were asked to rate their level of distress utilizing a rating dial indicating 0=no distress to 6=extremely distressed. Though not as robust an indicator of PTSD as idiographic trauma challenges, standardized trauma cues provide a higher degree of experimental control and have been found to be reliably associated with PTSD (e.g., Pole, 2007).

Data Cleaning

After the physiological data were collected, heart beat data were visually inspected for missed inter-beat intervals and to delete misidentified interbeat intervals resulting from movement artifact. Data for each channel were then reduced to second by second averages using the James Long system. Additional programs were developed by Dr. Pole to calculate the means, maximums, and minimums for the various phases of the study. These scores were then imported into SPSS 15.0. The self-report measures were entered into SPSS 15.0,

then double-checked for accuracy by another research assistant, and scored according to published conventions.

Data Cleaning and Data Reduction

Four trauma summary scores were generated from the THQ and CIHQ to differentiate between childhood and adulthood trauma exposure, and then victimization versus non-victimization trauma exposure. As discussed above, the "childhood victimization" summary score was calculated by adding the THQ items that indicated the number of types of victimization-related traumatic events endorsed and reported to have occurred before age 18 while the "other childhood trauma summary score" was calculated by adding the THQ items that indicated the number of types of traumatic events reported to have occurred before age 18. A new adulthood victimization summary score ("adulthood victimization") was calculated by summing the z score for the THQ non-duty adulthood victimization score (described above) and the z score for the CIHQ duty-related victimization score. An adult non-victimization trauma summary score ("other adulthood trauma") was calculated by summing the z score for the THQ non-duty other adulthood trauma score (described above) and the z score for the CIHQ other duty-related trauma score. Thus, the "adulthood victimization" is the standardized, total number of types of adulthood victimization that was reported to have occurred after age 18 (including those related to police-duty) and "other adulthood trauma" is the total number of types of adult non-victimization traumatic events that was reported to have occurred after age 18 (including those related to police-duty).

Data Analyses

Preliminary analyses for this study involved examining descriptive statistics for demographic characteristics for the overall sample. Individual sample *t* tests were also conducted to compare participants that were included in this study with those participants excluded due to missing/problematic data, and to determine if there were significant differences between groups on all study variables based on available data.

The main analyses were addressed in the following ways. First, to address if childhood victimization was related to PTSD severity and RSA measures, correlation analyses (Pearson's *r*) were conducted between childhood victimization, PTSD severity, and phasic RSA measured during the viewing of the various critical incident film scenes, thinking phase, and recovery phase, along with other potential covariates. In order to investigate if childhood victimization continued to be significantly related to PTSD severity and RSA differences after controlling for potential covariates, blocked entry, step-wise logistic regression analyses were then conducted. Potential covariates were identified in the correlation analyses previously discussed and relevant variables found to be significantly related to PTSD severity were entered into the regression model. Then, moderation analyses utilizing blocked entry, step-wise logistic regression analyses (Baron & Kenny, 1986) were used to determine if childhood victimization interacted with adulthood trauma exposure to influence RSA. Finally, to examine if RSA mediated the relationship between childhood victimization exposure and PTSD severity, mediation analyses utilizing blocked entry, step-wise logistic regression analyses were conducted (Baron & Kenny, 1986). Additional mediation analyses then determined if RSA continued to mediate the relationship between childhood victimization and PTSD severity after controlling for adulthood trauma exposure and other potential covariates. Potential multicollinearity was assessed by examining

Variance Inflation Factor (VIF) values. The resulting VIF values and standard errors were then examined to determine if the variable should be included or excluded from the final models, and then regression analyses were re-conducted excluding those problematic variables. All statistical analyses were accomplished using SPSS 17.0 and the threshold for significance was set at $p < .05$ (two-tailed).

Results

Descriptive Statistics for Study Sample

Table 2 presents descriptive statistics for the entire sample. Seven participants were excluded from the original 49 retired officers, due to problematic physiological and missing data yielding 35 participants available for analysis. Thirty-two participants were European American, two participants were African American, and one participant was Latino. The mean age of participants was 57 years and the mean duration of police service was 25 years. Participants were earning an average income of $69,714 per year and they had an average of 14.6 years of education. Approximately 43% (n=15) served in the military and 85.7% of participants (n=30) were currently married.

Individual sample *t* tests were then employed to compare participants included and excluded from this study's analyses based on all available data, specifically examining participants on demographic variables, predictors, and outcomes. Only one difference emerged: those excluded from the study due to missing data had significantly more years of education $t(47) = 2.15$, $p = 0.04$, than those participants included in study analyses.

Question 1: Is Childhood Victimization Related to PTSD Severity and RSA?

The first research question asked if there was a relationship between childhood victimization, PTSD severity, and phasic RSA measured during the viewing of the various critical incident film scenes, thinking phase, and recovery phase. Correlation analyses (Pearson's *r*) were used to examine the interrelationships among the study's dependent variables, primary predictor variables, and potential confounds. These associations are presented in an intercorrelation matrix in Table 3. As hypothesized, childhood victimization was positively related to PTSD as measured by the Mississippi PTSD scale, r=0.38, p=0.03, while other childhood trauma exposure was not related to PTSD. However, contrary to the study hypothesis, childhood victimization was related to larger RSA responses during the thinking phase, r=0.49, p<0.01, rather than smaller RSA responses. Additionally, PTSD was negatively associated with the phasic RSA during the severed head scene (clip 5), r=-0.34, p=0.048.

Question 2: Does Childhood Victimization Continue to Predict PTSD and RSA After Controlling for Potential Covariates/Confounds?

To examine the relationship of childhood victimization with PTSD symptoms in this sample after controlling for relevant covariates, blocked entry, step-wise logistic regression analyses were conducted. Table 4 presents these analyses. Two potential covariates related with the Mississippi PTSD scale were identified in the correlation analyses discussed above: adulthood victimization and other adulthood trauma. In order to control for these covariates, adulthood victimization and adulthood trauma were entered in Step 1 and childhood victimization was entered in Step 2. As hypothesized, childhood victimization continued to be positively related to Mississippi PTSD scale after controlling for both forms of adulthood trauma exposure (β= .44, p=.005).

To examine the association of childhood victimization with phasic RSA during the thinking phase after controlling for relevant covariates, blocked entry, step-wise logistic regression analyses were conducted. Table 5 presents these analyses. Only one potential covariate emerged related with phasic RSA during the thinking phase: other adulthood trauma. In order to control for this covariate, other adulthood trauma was entered in Step 1 and childhood victimization was entered in Step 2. Childhood victimization continued to be significantly positively related to phasic RSA during the thinking phase after controlling for other adulthood trauma ($\beta = .45$, $p = .005$). While the continued relationship with RSA was predicted, the positive relationship between childhood victimization and RSA was not predicted.

Question 3: Does Childhood Victimization Moderate the Relationship Between Adulthood Trauma Exposure and RSA?

The third research question asked whether childhood victimization moderated the relationship between adulthood trauma exposure and RSA, and this was tested utilizing blocked entry, step-wise logistic regression analyses. Table 6 presents the results of this investigation. To test potential moderation, Baron and Kenny's (1986) test for statistical moderation requires three conditions must be met. First, the predictor (other adulthood trauma) must be bivariately related to the outcome (phasic RSA during the thinking phase). This was tested by the correlation analyses discussed above. While adulthood victimization was not significantly related to RSA measures, other adulthood trauma was found to be related to the phasic RSA during the thinking phase, $r = 0.37$, $p < 0.05$ and this condition was met. Second, the proposed moderator (childhood victimization) must be bivariately related to the outcome (phasic RSA during the thinking phase). This condition was also tested by

the above correlation analyses, and childhood victimization was found positively associated with phasic RSA during the thinking phase, r=0.49, p<0.01. This second condition was satisfied. Third, their interaction term is entered into the regression model as a covariate and must significantly predict the outcome after controlling for the predictor and proposed moderator. After entering other adulthood trauma in Step 1 and childhood victimization in Step 2, their interaction term (other adulthood trauma X childhood victimization) was significantly related to the corrected RSA during the thinking phase (β=-0.53, p<.001). Thus, as predicted, childhood victimization moderated the relationship between adulthood trauma exposure and phasic RSA. When this interaction was plotted (not included), the analysis illustrated that when there is less "other" adulthood trauma and high child victimization, there is higher phasic RSA during the thinking phase, while higher "other" adulthood trauma and less childhood victimization leads to lower phasic RSA. This is contrary to the expected interaction of adulthood trauma exposure and childhood victimization.

Question 4: Does RSA Mediate the Relationship Between Child Victimization and PTSD Severity?

To determine if phasic RSA mediated childhood victimization's relationship with PTSD symptom severity in this sample, forced-entry, linear multiple regression analyses were conducted. These analyses were conducted with the phasic RSA during the severed head scene (clip 5) because this measure of RSA was found to be related to PTSD in the correlation analyses discussed above. These regression analyses are presented in Table 7 in Model A. Childhood victimization was entered in Step 1 and the phasic RSA during the severed head scene (clip 5) was entered into the model in Step 2. Childhood

victimization retained its statistical significance as a predictor, and thus phasic RSA during the severed head scene (clip 5) did not mediate the relationship between childhood victimization and the Mississippi PTSD scale in this sample, β=.44, *p*=.006.

Question 5: Does RSA Mediate the Relationship Between Childhood Victimization and PTSD Severity After Controlling for Potential Confounds?

To examine whether phasic RSA mediated the relationship between childhood victimization and PTSD symptoms after controlling for relevant demographic and trauma exposure variables, blocked entry, step-wise logistic regression analyses were conducted. These analyses are presented in Table 7 in Model B. Adulthood victimization and other adulthood trauma were entered in Step 1 and childhood victimization was entered in Step 2. However, when the phasic RSA during the severed head scene (clip 5) was entered into the model in Step 3, childhood victimization retained its significance, β=.47, *p*=.002. Thus, the phasic RSA during the severed head scene (clip 5) did not mediate the relationship between childhood victimization and the Mississippi PTSD scale in this sample.

Discussion

The purpose of this study was to examine the relative impact of childhood victimization on a physiological measure of emotion regulation (RSA) and PTSD severity among a group of retired police officers. Given the numerous traumatic experiences that are likely to occur over the course of police work and increased risk for the development of PTSD (Weiss et al., 1999; Pole et al., 2007), this population offers a distinct opportunity to examine the relationship between childhood victimization, adulthood post-traumatic stress symptoms, and adult RSA differences. Additionally, to date, there have been no single

studies that have examined childhood trauma exposure, adulthood trauma exposure, RSA, and PTSD together.

Childhood Victimization and PTSD. This study found that childhood victimization was positively related to PTSD severity, which is consistent with previous literature (e.g., Brewin, Andrews, & Valentine, 2000; Hetzel & McCanne, 2005; Widom, 1999). Additionally, childhood victimization continued to account for a large percentage of variance in PTSD severity even after accounting for adulthood trauma exposure. These findings may suggest a unique relationship childhood victimization has with PTSD severity relative to adulthood trauma exposure. Perhaps it suggests that childhood victimization is experienced as especially traumatic relative to adulthood trauma, or as often argued, this early victimization makes individuals particularly vulnerable for the development of adulthood PTSD later in life (Lloyd & Turner, 2003; Yehuda et al., 1995).

Childhood Victimization and RSA. This study found that childhood victimization was related to RSA, specifically during the thinking phase. However, contrary to the study hypothesis, childhood victimization was related to larger RSA responses during the thinking phase, rather than smaller RSA responses in regression analyses with and without controlling for adulthood trauma exposure. A negative relationship between childhood victimization and phasic RSA has been predicted, consistent with the findings from prior research that found lower RSA was associated with PTSD (Cohen et al., 1998; Scheeringa et al., 2004; Sahar et al, 2001). Higher phasic RSA is thought to reflect greater parasympathetic reactivity and is considered healthier as it is associated with physiological flexibility and predisposes individuals to emotional flexibility (Beauchaine, 2001; Porges, 1995, Porges et al., 1994; Thayer & Lane, 2000). This implies that when these retired police officers were asked to

think about the worst traumatic experience that occurred during their police work, increased childhood victimization was not related to physiological vulnerability (an underactive peripheral nervous system response) but to resilience (a more active attempt by the peripheral nervous system to down-regulate arousal). Perhaps this finding is influenced by a self-selection bias: individuals that self select to join the police force may be more resilient with respect to their emotion regulatory responses than those trauma exposed individuals from other studies.

Childhood victimization was not found to be related to phasic RSA during any other phase contrary to my hypotheses. The thinking phase may elicit a unique response because the participants were asked to recall their unique, worst traumatic event in police duty, unlike the critical incident video used in this study that has images of disturbing police duty related events that may or may not be related to the participant's own traumatic event. Therefore the thinking task acts as a direct traumatic stress reminder, and such reminders are known to elicit a unique response in those suffering from PTSD symptoms (Pole, 2007). The finding that childhood victimization was positively related to RSA may reflect that in those individuals with greater childhood victimization, the peripheral nervous system is working harder to successfully regulate the response to the distress to this trauma cue. Furthermore, if participants were asked to recall the childhood victimization, the findings may have differed and the RSA related to the thinking phase may have shown the expected valence.

Childhood Victimization as a Moderator. This study found that childhood victimization moderated the relationship between adulthood trauma exposure and phasic RSA. Our findings suggest that with less "other" adulthood trauma and more child victimization, there was higher phasic RSA while the retired officers thought about their worst trauma, while

more "other" adulthood trauma and less childhood victimization led to lower phasic RSA during this task. This is contrary to the additive effect expected with the interaction of adulthood trauma exposure and childhood victimization (i.e., more of both types of trauma exposures would lead to lower phasic RSA). Perhaps in this sample, when these two trauma exposures interact, more "other" adulthood trauma places individuals at greater risk for emotion regulation dysfunction (lower RSA) while less "other" adulthood trauma results in more emotion regulation resilience (higher RSA).

RSA as a Mediator. This study found while the phasic RSA during the severed head scene the total number of PTSD symptoms, this measure of RSA did not mediate the relationship between childhood victimization and PTSD severity with or without controlling for covariates. It may be possible that the laboratory tasks were all related to police duty related traumatic events. It also may be possible that this paradigm might not be sufficient to elicit the appropriate response in individuals impacted by childhood victimization and the sample may have been unusually well-adapted to police related stressors.

Limitations and Strengths

This study does have limitations. First, this study involved secondary data analysis and the measures of trauma exposure assessed for the number of types of trauma exposures, but did not specify the exact nature or severity of the trauma exposure. Thus, it is unclear which traumatic experiences were particularly distressing to participants, and were most linked to the distress measured. Second, this study is cross-sectional and thus limits our ability to make causal inferences about childhood victimization. Third, this study is based on a relatively small convenience sample of fairly ethnically homogeneous, primarily male

retired police officers. Therefore the findings may not be generalizable to all police officers, ethnic groups, ages, or across genders. Fourth, given the advanced age of the participants (average age was 57 years old), it is also unclear how the physiological measures may have been impacted by age given preliminary research that has evidenced an inverse relationship between age and RSA (Masi, Hawkley, Rickett, and Cacioppo, 2007). Fifth, as discussed above, the laboratory tasks were all related to police-duty related traumatic events, and this might not be sufficient to elicit the appropriate response in individuals impacted by childhood victimization. Finally, this study relies on self-report and retrospective data, and therefore may not be accurate.

However, there also are notable strengths. First, this is the first study to date assess the relationships among RSA, PTSD, childhood victimization, and adulthood trauma exposure. Second, this study included well-validated and accepted PTSD and RSA measures, strengthening inferences about the specific effects of childhood victimization on adult outcomes. Third, these data strengthen our understanding of how multiple trauma exposures contribute to risk for psychophysiological difficulties and PTSD.

Directions for future research

From this data, we were not able to learn how different forms of childhood victimization may lead to different outcomes, and why other adulthood trauma exposure was differentially related with RSA and PTSD outcomes. Further psychophysiological studies with adult survivors of various forms of childhood and adulthood trauma might advance our understanding of the distinguishing characteristics of traumatic exposure that are most salient in influencing emotion-related processes and PTSD outcomes. Future research

should extend this analysis to more diverse samples with respect to ethnicity, age, and gender. Potential contributors to resilience from the psychiatric sequelae of childhood and adulthood trauma exposure should be included in future studies, such as the role of social support.

Clinical and Theoretical Implications

The present study suggests that providers need to attend to emotion regulation difficulties throughout therapeutic treatment planning when working with adults with a history of childhood victimization. Additionally, clinical assessment and treatment planning with individuals with trauma histories may benefit from assessing trauma exposure across the lifespan and across types (e.g., domestic violence, war, or motor vehicle accidents). History taking that uses a framework eliciting additive experiences may be informative. These data particularly point to the contribution of multiple lifetime (but non-abuse) exposures to the development and persistence of PTSD among childhood victimization survivors. Further research should be conducted to continue to explore the intersection of psychophysiology, emotion regulation, and PTSD among individuals with complex trauma histories.

References

American Psychiatric Association. (2000), Diagnostic and statistical manual of mental disorders (Rev. 4th ed.). Washington, DC.

Banyard, V., Williams, L., & Siegel, J. (2001, July). Understanding links among childhood trauma, dissociation and women's mental health. *American Journal of Orthopsychiatry*, *71*(3), 311-321.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.

Beauchaine, T. P. (2001). Vagal tone, development, and gray's motivational theory: Toward an integrated model of autonomic nervous system functioning in psychopathology. *Development and Psychopathology, 13*(2), 183-214.

Berntson, G. G., Cacioppo, J. T., & Quigley, K. S. (1993). Respiratory sinus arrhythmia: Autonomic origins, physiological mechanisms, and psychophysiological implications. *Psychophysiology, 30*(2), 183-196.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*(5), 748-766.

Briere, J., & Runtz, M. (1990). Augmenting hopkins SCL scales to measure dissociative symptoms: Data from two nonclinical samples. *Journal of Personality Assessment, 55*(1), 376-379.

Butler, E. A., Wilhelm, F. H., & Gross, J. J. (2006). Respiratory sinus arrhythmia, emotion, and emotion regulation during social interaction. *Psychophysiology, 43*, 612-622.

Bugental, D. B., Blue, J., & Lewis, J. (1990). Caregiver beliefs and dysphoric affect directed to difficult children. *Developmental Psychology, 26*(4), 631-638.

Cloitre, M., Miranda, R., Stovall-McClough, K. C., & Han, H. (2005). Beyond PTSD: Emotion regulation and interpersonal problems as predictors of functional impairment in survivors of childhood abuse. *Behavior Therapy, 36*(2), 119-124.

Cohen, H., Kotler, M., Matar, M., Kaplan, Z., Loewenthal, U., Miodownik, H., et al. (1998). Analysis of heart rate variability in posttraumatic stress disorder patients in response to a trauma-related reminder. *Biological Psychiatry, 44*, 1054-1059.

De Bellis, M. D. (2001). Developmental traumatology: The psychobiological development of maltreated children and its implications for research, treatment, and policy. *Development and Psychopathology, 13*(3), 539-564.

Demaree, H. A., Robinson, J. L., Everhart, D. E., & Schmeichel, B. J. (2004). Resting RSA is associated with natural and self-regulated responses to negative emotional stimuli. *Brain and Cognition, 56*(1), 14-23.

During, S. M., & McMahon, R. J. (1991). Recognition of emotional facial expressions by abusive mothers and their children. *Journal of Clinical Child Psychology, 20*(2), 132-139.

Frewen, P. A., & Lanius, R. A. (2006). Toward a psychobiology of posttraumatic self-dysregulation: Reexperiencing, hyperarousal, dissociation, and emotional numbing. In R. Yehuda (Ed.), *Psychobiology of posttraumatic stress disorders: A decade of progress (vol. 1071).* (pp. 110-124). Malden, MA, US: Blackwell Publishing.

Garber, J., & Dodge, K. A. (1991). *The development of emotion regulation and dysregulation*. New York, NY, US: Cambridge University Press.

Graham-Bermann, S. A. (1996). Family worries: Assessment of interpersonal anxiety in children from violent and nonviolent families. *Journal of Clinical Child Psychology, 25*(3), 280-287.

Green, M. W., Rogers, P. J., & Hedderley, D. (1996). The time course of mood-induced decrements in colour-naming of threat-related words. *Current Psychology: Developmental, Learning, Personality, Social, 14*(4), 350-358.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271-299.

Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current Directions in Psychological Science, 10*(6), 214-219.

Gross, J., Carstensen, L., Pasupathi, M., Tsai, J., Götestam Skorpen, C., & Hsu, A. (1997, December). Emotion and aging: Experience, expression, and control. *Psychology and Aging*, *12*(4), 590-599.

Grossman, P., Karemaker, J., & Wieling, W. (1991, March). Prediction of tonic parasympathetic cardiac control using respiratory sinus arrhythmia: The need for respiratory control. *Psychophysiology*, *28*(2), 201-216.

Grossman, P., & Kollai, M. (1993). Respiratory sinus arrhythmia, cardiac vagai tone, and respiration: Within- and between-individual relations. *Psychophysiology, 30*(5), 486-495.

Grossman, P., Stemmler, G., & Meinhardt, E. (1990, July). Paced respiratory sinus arrhythmia as an index of cardiac parasympathetic tone during varying behavioral tasks. *Psychophysiology*, *27*(4), 404-416.

Heim, C., Newport, D. J., Wagner, D., Wilcox, M. M., Miller, A. H., & Nemeroff, C. B. (2002). The role of early adverse experience and adulthood stress in the prediction of neuroendocrine stress reactivity in women: A multiple regression analysis. *Depression and Anxiety, 15*(3), 117-125.

Herrenkohl, R., Herrenkohl, E., Egolf, B., & Wu, P. (1991) The developmental consequences of child abuse: The Lehigh Longitudinal Study. *In R. H.* Starr, Raymond, Jr. & D.A. Wolfe (Eds), *The effects of child abuse and neglect: Issues and research* (pp. 57-81). New York, NY, US: Guilford Press.

Hetzel, M. D., & McCanne, T. R. (2005). The roles of peritraumatic dissociation, child physical abuse, and child sexual abuse in the development of posttraumatic stress disorder and adult victimization. *Child Abuse & Neglect, 29*(8), 915-930.

Houtveen, J. H., Rietveld, S., & De Geus, E. J. C. (2002). Contribution of tonic vagal modulation of heart rate, central respiratory drive, respiratory depth and respiratory frequency to respiratory sinus arrhythmia during mental stress and physical exercise. *Psychophysiology, 39*(4), 427-436.

Hund, A. R., & Espelage, D. L. (2006). Childhood emotional abuse and disordered eating among undergraduate females: Mediating influence of alexithymia and distress. *Child Abuse & Neglect, 30*(4), 393-407.

Johnson, H., & Thompson, A. (2008). The development and maintenance of post-traumatic stress disorder (PTSD) in civilian adult survivors of war trauma and torture: A review. *Clinical Psychology Review, 28*(1), 36-47.

Katz, C. L., Pellegrino, L., Pandya, A., Ng, A., & DeLisi, L. E. (2002). Research on psychiatric outcomes and interventions subsequent to disasters: A review of the literature. *Psychiatry Research, 110*(3), 201-217.

Keane, T., Caddell, J., & Taylor, K. (1988, February). Mississippi Scale for Combat-Related Posttraumatic Stress Disorder: Three studies in reliability and validity. *Journal of Consulting and Clinical Psychology*, *56*(1), 85-90.

Kilpatrick, D. G., Ruggiero, K. J., Acierno, R., Saunders, B. E., Resnick, H. S., & Best, C. L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: Results from the national survey of adolescents. *Journal of Consulting and Clinical Psychology, 71*(4), 692-700.

Klimes-Dougan, B., & Kistner, J. (1990). Physically abused preschoolers' responses to peers' distress. *Developmental Psychology, 26*(4), 599-602.

Kring, A. M., & Werner, K. H. (2004). Emotion regulation and psychopathology. In P. Philippot, & R. S. Feldman (Eds.), *The regulation of emotion.* (pp. 359-385). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Lenox, M. C., & Gannon, L. R. (1983). Psychological consequences of rape and variables influencing recovery: A review. *Women & Therapy, 2*(1), 37-49.

Maker, A. H., Kemmelmeier, M., & Peterson, C. (1998). Long-term psychological consequences in women of witnessing parental physical conflict and experiencing abuse in childhood. *Journal of Interpersonal Violence, 13*(5), 574-589.

Malatesta, C. Z., & Haviland, J. M. (1982). Learning display rules: The socialization of emotion expression in infancy. *Child Development, 53*(4), 991-1003.

Masten, C. L., Guyer, A. E., Hodgdon, H. B., McClure, E. B., Charney, D. S., Ernst, M., et al. (2008). Recognition of facial emotions among maltreated children with high rates of post-traumatic stress disorder. *Child Abuse & Neglect, 32*(1), 139-153.

Maughan, A., & Cicchetti, D. (2002). Impact of child maltreatment and interadult violence on children's emotion regulation abilities and socioemotional adjustment. *Child Development, 73*(5), 1525-1542.

McLean, L. M., Toner, B., Jackson, J., Desrocher, M., & Stuckless, N. (2006). The relationship between childhood sexual abuse, complex post-traumatic stress disorder and alexithymia in two outpatient samples examination of women treated in community and institutional clinics. *Journal of Child Sexual Abuse, 15*(3), 1-17.

Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social Development, 16*(2), 361-388.

Otte, C., Neylan, T. C., Pole, N., Metzler, T., Best, S., Henn-Haase, C., et al. (2005). Association between childhood trauma and catecholamine response to psychological stress in police academy recruits. *Biological Psychiatry, 57*(1), 27-32.

Paivio, S. C., & Laurent, C. (2001). Empathy and emotion regulation: Reprocessing memories of childhood abuse. *Journal of Clinical Psychology, 57*(2), 213-226.

Parker, G., Hadzi-Pavlovic, D., Brodaty, H., & Boyce, P. (1992). Predicting the course of melancholic and nonmelancholic depression: A naturalistic comparison study. *Journal of Nervous and Mental Disease, 180*(11), 693-702.

Pole, N. (2007). The psychophysiology of posttraumatic stress disorder: A meta-analysis. *Psychological Bulletin, 133*(5), 725-746.

Pole, N., Neylan, T. C., Otte, C., Metzler, T. J., Best, S. R., Henn-Haase, C., et al. (2007). Associations between childhood trauma and emotion-modulated psychophysiological responses to startling sounds: A study of police cadets. *Journal of Abnormal Psychology, 116*(2), 352-361.

Porges, S. W. (1991). Vagal tone: An autonomic mediator of affect. In J. Garber, & K. A. Dodge (Eds.), *The development of emotion regulation and dysregulation.* (pp. 111-128) Cambridge University Press.

Porges, S. W. (1995). Cardiac vagal tone: A physiological index of stress. *Neuroscience & Biobehavioral Reviews, 19*(2), 225-233.

Masai, C., Hawkley, L., Rickett, E., & Cacioppo, J. (2007). Respiratory sinus arrhythmia and diseases of aging: Obesity, diabetes mellitus, and hypertension. *Biological Psychology, 74*(2), 212.

Rottenberg, J., Clift, A., Bolden, S., & Salomon, K. (2007). RSA fluctuation in major depressive disorder. *Psychophysiology, 44*(3), 450-458.

Sack, M., Hopper, J. W., & Lamprecht, F. (2004). Low respiratory sinus arrhythmia and prolonged psychophysiological arousal in posttraumatic stress disorder: Heart rate dynamics and individual differences in arousal regulation. *Biological Psychiatry, 55*(3), 284-290.

Sahar, T., Shalev, A. Y., & Porges, S. W. (2001). Vagal modulation of responses to mental challenge in posttraumtic stress disorder. *Biological Psychiatry, 49*(7), 637-643.

Scheeringa, M. S., Zeanah, C. H., Myers, L., & Putnam, F. (2004). Heart period and variability findings in preschool children with posttraumatic stress symptoms. *Biological Psychiatry, 55*(7), 685-691.

Shields, A., Ryan, R. M., & Cicchetti, D. (2001). Narrative representations of caregivers and emotion dysregulation as predictors of maltreated children's rejection by peers. *Developmental Psychology, 37*(3), 321-337.

Shipman, K. L., Schneider, R., Fitzgerald, M. M., Sims, C., Swisher, L., & Edwards, A. (2007). Maternal emotion socialization in maltreating and non-maltreating families: Implications for children's emotion regulation. *Social Development, 16*(2), 268-285.

Shipman, K., Zeman, J., Penza, S., & Champion, K. (2000). Emotion management skills in sexually maltreated and nonmaltreated girls: A developmental psychopathology perspective. *Development and Psychopathology, 12*(1), 47-62.

Silk, J. S., Shaw, D. S., Skuban, E. M., Oland, A. A., & Kovacs, M. (2006). Emotion regulation strategies in offspring of childhood-onset depressed mothers. *Journal of Child Psychology and Psychiatry, 47*(1), 69-78.

Stimpson, N. J., Thomas, H. V., Weightman, A. L., Dunstan, F., & Lewis, G. (2003). Psychiatric disorder in veterans of the persian gulf war of 1991: Systematic review. *British Journal of Psychiatry, 182*(5), 391-403.

Thayer, J. F., & Lane, R. D. (2000). A model of neurovisceral integration in emotion regulation and dysregulation. *Journal of Affective Disorders, 61*, 201-216.

Tull, M. T., Barrett, H. M., McMillan, E. S., & Roemer, L. (2007). A preliminary investigation of the relationship between emotion regulation difficulties and posttraumatic stress symptoms. *Behavior Therapy, 38*(3), 303-313.

Tull, M. T., Jakupcak, M., McFadden, M. E., & Roemer, L. (2007). The role of negative affect intensity and the fear of emotions in posttraumatic stress symptom severity among victims of childhood interpersonal violence. *Journal of Nervous and Mental Disease, 195*(7), 580-587.

Turner, R., & Lloyd, D. (1995, December). Lifetime traumas and mental health: The significance of cumulative adversity. *Journal of Health and Social Behavior*, *36*(4), 360-376.

van der Kolk,Bessel A. (1996). The complexity of adaptation to trauma: Self-regulation, stimulus discrimination, and characterological development. In van der Kolk,Bessel A., A. C. McFarlane & L. Weisaeth (Eds.), *Traumatic stress: The effects of overwhelming experience on mind, body, and society.* (pp. 182-213). New York, NY, US: Guilford Press.

Watts-English, T., Fortson, B. L., Gibler, N., Hooper, S. R., & DeBellis, M. D. (2006). The psychobiology of maltreatment in childhood. *Journal of Social Issues, 62*(4), 717-736.

Weiss, D. S., Brunet, A., Metzler, T., Best, S. R., Fagan, J., & Marmar, C. R. (1999). Critical incident exposure in police officers: Frequency, impact, and correlates. *Paper presented at the meeting of the international society for traumatic stress studies*, Northbrook, Illinois.

Weiss, D., Brunet A., Pole N., Metzler T.J., Liberman A., Fagan J.A., et al. (2005) The Critical Incident History Questionnaire: A method for measuring total cumulative exposure to critical incidents in police officers. Manuscript submitted for publication.

Widom, C. S. (1999). Posttraumatic stress disorder in abused and neglected children grown up. *American Journal of Psychiatry, 156*(8), 1223-1229.

Wolfsdorf, B. A., & Zlotnick, C. (2001). Affect management in group therapy for women with posttraumatic stress disorder and histories of childhood sexual abuse. *Journal of Clinical Psychology, 57*(2), 169-181.

Yehuda, R. (1999). Parental PTSD as a risk factor for PTSD. *Risk factors for posttraumatic stress disorder* (pp. 93-123). Washington, DC US: American Psychiatric Association.

Zlotnick, C., Mattia, J. I., & Zimmerman, M. (2001). The relationship between posttraumatic stress disorder, childhood trauma and alexithymia in an outpatient sample. *Journal of Traumatic Stress, 14*(1), 177-188.

Table 3-1.

Summary of previous studies on RSA, emotion regulation, and PTSD.

RSA	Empirical correlates found in previous literature:
High RSA Baseline (e.g., Beauchaine, 2001; Porges, 1995, Porges, Doussard-Roosevelt, & Maita, 1994; Thayer & Lane, 2000)	• More adaptively controlled affective processes • Calmer autonomic states • Quicker recoveries from stress • Physiological flexibility • Emotional flexibility • Appropriate engagement with the physical and social environment
Lower RSA Baseline (e.g., Crowell et al., 2005; Demaree, Robinson, Everhart, & Schmeichel, 2004; Rottenberg, Clift, Bolden, & Salomon, 2007; Thayer & Lane 2000)	• Diminished capacity to cope with stress • Poor emotional adaptability and flexibility • Impaired social functioning • Presence of psychopathology • PTSD diagnosis
RSA reactivity (e.g., Cohen et al., 1998; Sack et al., 2004; Scheeringa, Zeanah, Myers, & Putnam, 2004)	• Less RSA reactivity to trauma imagery/stimuli in individuals with PTSD diagnosis

Table 3-2.
Background Variables for Entire Sample and Groups.

Variable	Overall Sample N=142 M(SD) or N(%)
Demographics	
Age	59.58 (8.17)
Education	14.89 (2.36)
Income	67.18 (26.02)
Married	119 (83.8%)
Police Service Years	24.68 (8.04)
Military Service	67 (47.18%)
Gender	
Male	131 (92.3%)
Female	11 (7.7%)
Ethnicity	
Caucasian	136 (95.8%)
Minority	5 (3.5%)
Trauma	
Other Child Trauma (Types)	0.42 (1.02)
Adult Trauma (Types)	2.80 (2.47)
Police Duty-Related Traumatic Incidents	277.80 (196.78)

Note. One participant did not report his ethnicity. Married coded: 0 = Married and 1 = Not married. Military service coded: 0 = no military service and 1 = military service.
*p < 0.05 ***p < 0.01 ***p < 0.001

Table 3-3.
Intercorrelations between primary predictor variables, dependent variables, and childhood violence exposure (N = 142).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Child Victim-ization	-																	
2. Mississippi PTSD Total	0.38*	-																
3. Age	-0.04	-0.28	-															
4. Gender	-0.08	-0.22	0.14	-														
5. Years of Police Service	0.02	-0.18	0.04	0.02	-													
6. Income	0.02	0.07	-0.27	-0.06	0.17	-												
7. Education	0.00	-0.02	-0.17	-0.27	-0.17	0.15	-											
8. Adulthood Victim-ization	-0.18	0.40*	-0.17	-0.20	-0.15	0.04	0.07	-										
9. Other Adulthood trauma	0.05	0.34*	-0.23	-0.16	0.06	-0.09	0.14	0.59***	-									
10. Other Child Trauma	0.34*	0.04	-0.37*	-0.12	0.05	0.23	-0.04	-0.20	-0.11	-								
11. RSA Thinking Phase	0.49**	0.34	-0.05	0.02	0.03	-0.25	-0.21	0.30	0.38*	0.09	-							
12. RSA Dumpster	-0.21	-0.17	-0.06	0.07	-0.19	0.23	-0.08	-0.04	-0.12	-0.02	-0.22	-						
13. RSA Drunk Driving	-0.18	-0.15	-0.04	0.01	-0.08	0.32	-0.18	-0.06	-0.14	0.02	-0.25	0.78***	-					

Scene																	
14. RSA Dead Boy	-0.06	-0.12	0.23	0.01	0.12	0.23	-0.13	-0.11	-0.14	-0.13	-0.27	0.66***	0.74***	-			
15. RSA Hit and Run Scene	0.29	-0.01	.52**	0.00	0.15	-0.01	0.20	-0.18	-0.04	-0.03	0.23	-0.10	-0.11	0.19	-		
16. RSA Severed Head	0.14	-0.34*	0.31	0.01	0.02	0.11	0.05	-0.29	-0.22	0.23	-0.11	-0.03	0.14	0.05	0.42*	-	
17. RSA Animal Control	-0.13	-0.25	0.23	0.00	0.32	0.11	0.28	-0.13	-0.26	0.00	-0.29	0.04	0.10	0.17	0.21	0.54**	-
18. RSA Nurse Stabbing	-0.12	-0.25	0.16	0.02	-0.09	0.21	-0.19	-0.28	-0.38*	0.34*	-0.33	0.52**	0.57***	0.57***	0.18	0.41*	0.25

Note. Due to space constraints, marital status, minority status, and military service were excluded from the correlation matrix since they were not significantly related to the primary predictor variables or outcome variables.
*p < 0.05 ***p < 0.01 ***p < 0.001

Table 3-4.

Relationship Between Childhood Victimization and PTSD after Controlling for Confounds and Covariates (N = 35).

		Mississippi PTSD Total							
Step	Explanatory Variables	B	SEB	β	*p*	R^2	*Adj* R^2	ΔR^2	F
Step1						0.23	0.18	0.23	4.76*
	Adulthood Victimization	4.59	2.55	0.39	.082				
	Other Adulthood Trauma	1.43	2.47	0.12	.567				
Step 2						0.41	0.35	0.18	7.13**
	Adulthood Victimization	6.27	2.34	0.53	.012				
	Other Adulthood Trauma	-0.14	2.26	-0.01	.951				
	Childhood Victimization	11.17	3.65	0.44	.005				

*p < 0.05 ***p < 0.01 ***p < 0.001

Table 3-5.
Relationship Between Childhood Victimization and RSA after Controlling for Confounds and Covariates (N=35).

		Corrected RSA During Thinking Phase							
Step	Explanatory Variables	B	SEB	B	*p*	R^2	*Adj* R^2	ΔR^2	F
Step 1									
	Other Adulthood Trauma	0.004	0.002	0.37	0.033	0.14	0.11	0.14	4.97*
Step 2									
	Other Adulthood Trauma	0.003	0.002	0.32	0.042	0.34	0.29	0.20	7.65**
	Childhood Victimization	0.01	0.003	0.45	0.005				

*p < 0.05 ***p < 0.01 ***p < 0.001

Table 3-6.

Moderator Analyses Predicting RSA During the Thinking Phase (N=35).

		Corrected RSA During Thinking Phase							
Step	Explanatory Variables	B	SEB	β	*P*	R^2	*Adj* R^2	ΔR^2	F
Step 1						0.14	0.11	0.14	4.97*
	Other Adulthood Trauma	0.004	0.002	0.37	.033				
Step 2						0.34	0.29	0.20	7.65**
	Other Adulthood Trauma	0.003	0.002	0.32	.042				
	Childhood Victimization	0.01	0.003	0.45	.005				
Step 3						0.57	0.53	0.24	13.03***
	Other Adulthood Trauma	0.001	0.001	0.10	.470				
	Childhood Victimization	0.01	0.003	0.49	.000				
	Other Adulthood Trauma X CV	-0.01	0.003	-0.53	.000				

Note. Independent variables have been centered.
*p < 0.05 ***p < 0.01 ***p < 0.001

Table 3-7.
Mediator Analyses Examining RSA on Relationships Between Childhood Victimization and PTSD (N = 35).

		Mississippi PTSD Total							
Step	Explanatory Variables	B	SEB	B	*p*	R^2	*Adj* R^2	ΔR^2	F
Model A. Simple Mediation Model									
Step 1						0.14	0.12	0.14	5.55*
	Childhood Victimization	9.70	4.12	0.38	.025				
Step 2						0.30	0.26	0.16	6.85**
	Childhood Victimization	11.15	3.82	0.44	.006				
	RSA Severed Head Scene	-590.27	221.17	-0.40	.012				
Model B. Mediation Model With Adulthood Trauma Variables									
Step 1						0.23	0.18	0.23	4.76*
	Adulthood Victimization	4.59	2.55	.39	.082				
	Other Adulthood Trauma	1.43	2.47	.12	.567				
Step 2						0.41	0.35	0.18	7.13**
	Adulthood Victimization	6.268	2.338	.53	.012				
	Other Adulthood Trauma	-.14	2.26	-.01	.951				
	Childhood Victimization	11.17	3.65	.44	.005				
Step 3						0.49	0.42	0.08	7.25***
	Adulthood Victimization	5.11	2.26	.43	.031				
	Other Adulthood Trauma	.36	2.14	.03	.867				
	Childhood Victimization	11.90	3.45	.47	.002				
	RSA Severed Head Scene	-444.95	200.72	-.30	.034				

*p < 0.05 ***p < 0.01 ***p < 0.001

Chapter 4

Childhood Witnessing Versus Direct Exposure to Abuse as Correlates to PTSD, Coping, and Mental Health Treatment among Pregnant Women in a Community Sample

Though there is an extant literature on the effects of direct abuse and witnessing interpersonal violence (IPV) in childhood, there remain important gaps in research on the effects of these particular exposures in adulthood. The relative impact of experiencing direct abuse or witnessing IPV in childhood has not been well-quantified in previous research on adult outcomes, and few studies have controlled for adult trauma exposure. Additionally, much is still not understood on how individuals with posttraumatic distress resulting from these particular forms of violence exposure cope with such distress and seek help managing it.

The estimated prevalence rates for direct child abuse and witnessing IPV in childhood highlight the need to be better informed on understanding the impact of this trauma exposure. In the United States, 3.5 million children were referred to state agencies for maltreatment in the year 2005; of those investigated, an estimated 899,000 children were determined to have been subject to physical abuse, sexual abuse, emotional abuse, and neglect (U.S. Department of Health & Human Services, 2005). Additionally, it is estimated that 15 million children witness IPV (McDonald, Jouriles, Ramisetty-Mikler, Caetano, &

Green, 2007). Further, multiple studies have found that there are high co-occurrence rates of spousal abuse and physical child abuse (Henning et al., 1997; Malone, Tyree, & O'Leary, 1989; Strauss, 1992). Studies that examined simultaneous child abuse and IPV exposure found that this co-occurrence ranged from 20% to 100% (e.g., Appel & Holden, 1998; Holden, 2003) due to differences in types of samples studied (e.g., clinical versus shelter populations). In recent years, investigators have attempted to study each form of childhood violence exposure in isolation (e.g., Higgins & McCabe, 2000a, 2000b, 2001a) to evaluate their corresponding short-term and long-term correlates, and to explore the ways these survivors manage their potential distress.

Given the traumatic nature of experiencing abuse and witnessing IPV (Peled, Jaffe, & Edelson, 1995; Straus, 1992), one correlate that has captured the interest of researchers is the development of PTSD (e.g., Haugaard, 2004; Kilpatrick, Ruggiero, et al., 2003). PTSD is characterized by symptoms of re-experiencing trauma, avoidance of trauma reminders, numbing of emotional responsiveness, and hyperarousal symptoms (American Psychiatric Association, 2000). Child maltreatment survivors are found to be at particular risk for developing PTSD (e.g., Boney-McCoy & Finkelhor, 1996; Haugaard, 2004; Kilpatrick, Ruggiero, et al., 2003), as are child witnesses of IPV (e.g., see Lehmann, 2000 for a full review). Moreover, the presence of IPV in the home has been found to increase the risk for child maltreatment (e.g., Belsky, 1993; McGuigan & Pratt, 2001) and research on children exposed to both direct abuse and witnessing IPV displayed very similar PTSD symptoms to the above-mentioned groups (for a full review, see Herrenkohl, Sousa, Tajima, Herrenkohl, and Moylan, 2008). This literature suggests that children exposed to both types of early violence have worse mental health outcomes than those children exposed to abuse or

witnessing IPV alone (e.g., Carlson, Furby, Armstrong, & Shales, 1997; Fantuzzo, DePaola, Lambert, Martino, Anderson, & Sutton, 1991; Hughes et al., 1989). PTSD in childhood is also related to impairment in multiple domains, such as interruptions and delays in cognitive, motor, social, and affective developmental trajectories (e.g., Stafford, Zeanah, & Scheeringa, 2003; Lieberman, 2004), problems in relationships with others (e.g., Cicchetti & Lynch, 1995; Shonk & Cicchetti, 2001), and altered psycho-biology (Beers & De Bellis, 2002; Christopher, 2004; De Bellis, 2001; Weber & Reynolds, 2004). Unfortunately, the deleterious impact of this early violence exposure does not appear to end in childhood, and is suggested to continue into adulthood.

Clinical research on adult survivors of childhood abuse and the subsequent development of psychopathology has been preliminarily substantiated. An emergent literature has evidenced the relationship between child abuse and the subsequent development of PTSD in adulthood (e.g., Brewin, Andrews, & Valentine, 2000; Hetzel & McCanne, 2005; Widom, 1999; Bremner et al., 1993). Widom (1999) found that approximately one-third of adults who were victims of direct abuse (physical abuse, sexual abuse, or neglect) met the criteria for lifetime PTSD. In a study on college women, Feerick and Haugaard (1999) found that direct experiences of abuse accounted for an additional 9% of variance in the prediction of self-reported PTSD symptoms, even after controlling for potential confound factors (e.g., demographic variables and the presence of adult maltreatment exposure). One study found that a history of childhood sexual abuse was directly related to adulthood PTSD symptoms (Nishith, Mechanic, & Resnick, 2000). In addition to PTSD, adult survivors of direct child abuse are found to be at increased risk when compared to adults not abused in childhood for the development of other psychiatric

disorders in adulthood, such as other anxiety disorders (e.g., Kendler et al., 1992; Kessler, Davis, & Kendler, 1997), mood disorders (e.g., Bifulco, Moran, Baines, Bunn, & Stanford, 2002), and substance use disorders (e.g., Brown & Anderson, 1991).

A smaller research body has documented the adverse posttraumatic psychiatric sequelae in adulthood of witnessing of IPV in childhood. Thus far, the empirical literature suggests that adult survivors of IPV in childhood are at increased risk when compared to non-witnesses for developing PTSD symptoms (e.g., Briere & Runtz, 1990; Feerick & Haugaard, 1999, Maker et al., 1998, Silvern et al., 1995), as well as depressive and anxiety symptoms (e.g., Forsstrom-Cohen & Rosenbaum, 1985), increased substance abuse (e.g., alcohol dependence; Downs, Capshew, & Rindels, 2004), and increased overall psychiatric symptom severity (e.g., Henning, Leitenberg, Coffey, Bennett, & Jankowski, 1996, 1997). Additionally, research has established that these individuals are more likely to be in an abusive relationship in adulthood, and thus are more likely to be re-victimized (e.g., Cappell & Heiner, 1990; Doumas, Margolin, & John, 1994). Witnessing IPV has been found to interact with child maltreatment to increase negative effects on adult mental health outcomes (e.g., Briere & Elliot, 1993; Higgins & McCabe, 1994). Research examining the presence of co-occurring childhood abuse and witnessing IPV found that these adult survivors had worse mental health outcomes than those associated with single forms of childhood violence exposure (for a full review, see Higgins & McCabe, 2001). While the research thus far on adult survivors of childhood violence exposure have been informative, this literature is small and suffers from a few empirical gaps.

First, the majority of studies that have examined PTSD in adult survivors of childhood violence have neglected to sufficiently assess for two important confounding factors:

adulthood trauma exposure and non-abuse childhood trauma exposure (e.g., Henning, Leitenberg, Coffey, Bennett, & Jankowski, 1997). Adult trauma exposure has been found to be associated with quite similar negative outcomes (i.e., the development of PTSD symptoms and other psychiatric distress) as evidenced by the extant rape-survivor, combat veteran, refugee, and disaster literatures (e.g., Lenox & Gannon, 1983; Johnson & Thompson, 2008; Katz, Pellegrino, & Pandya, 2002; Stimpson, Thomas, Weightman, Dunstan, & Lewis, 2003). Given the evidence that adult trauma exposure has effects on the presence and expression of PTSD, it is unclear whether these emotional and psychiatric outcomes are due to childhood violence exposure, and/or adult trauma exposure. The failure to control for adult trauma exposure is especially problematic given that prior research has repeatedly found that childhood abuse survivors and IPV witnesses are at increased risk for revictimization in adulthood, and thus are at increased risk for continued trauma exposure (for a review, see Stith et al., 2000). Similarly, failing to control for other non-abuse childhood trauma exposure (e.g., serious illness or natural disaster) is problematic because it prevents researchers from accounting for or controlling for a type of life experience that is known to have an important impact on PTSD outcomes (e.g., pediatric traffic injury; deVries et al., 2004).

Second, the field is still unclear about the specific effects of various types of childhood violence exposure on adult PTSD. Attempts to isolate their unique contributions have had mixed results. While some research has found that women who had witnessed IPV in childhood endorsed more trauma-related symptoms than women without an IPV witness history (Feerick & Haugaard, 1999; Maker, Kemmelmeier, & Peterson, 1998; & Silvern et al., 1995), other research found, after controlling for childhood physical and sexual abuse, that

the relationship between childhood IPV exposure and trauma symptoms was insignificant (Maker, Kemmelmeier, & Peterson, 1998; Silvern et al., 1995). More research is needed to better understand the potential differences between these types of early violence exposure on specific adult PTSD outcomes, such as the presence of PTSD, the number of PTSD symptoms, PTSD distress severity, domains of PTSD-related impairment, and PTSD symptom counts by criteria (i.e., reexperiencing, avoidance/numbing, and arousal).

Third, there is a paucity of research based on diverse community samples that compare adult survivors of childhood maltreatment and IPV-exposure on PTSD outcomes. Prior research has primarily relied on samples of college students (Davies, DiLillo, & Martinez, 2004; de Paul et al., 1995; Higgins & McCabe, 1994; Feerick & Haugaard, 1999) and clinical samples (e.g., Bagley & McDonald, 1984; Roth et al., 1997; Wallace, 1990). Very few studies have utilized community samples to delineate the differential impact of IPV and child abuse on the various aspects of PTSD (e.g., number of PTSD symptoms, PTSD distress severity, domains of PTSD-related impairment) in adults (e.g., Henning, Leitenberg, Coffey, Turner, & Bennett, 1996; Higgins & McCabe, 2000; Roesler & McKenzie, 1994; Wallace, 1990). This has left the field with many unanswered questions about the differential impact of these various types of trauma exposure on adult survivors of childhood violence exposure in a community setting.

Finally, very little is known about how experiencing direct abuse and witnessing IPV as a child impacts the selection of coping strategies and mental health treatment options as adults. There are very few studies on the selection of coping strategies by individuals exposed to different types of childhood violence, and there are no studies to date on the selection of mental health treatment options for different childhood violence exposed

groups. In one study of female college students, Lietenberg, Gibson, and Novy (2004) found that a greater severity of childhood abuse was associated with an increased utilization of disengagement methods of coping (e.g., wishful thinking and problem avoidance), while engagement methods of coping (e.g., problem solving and use of social support) were not significantly related to child abuse severity. More information on the differential selection of coping strategies and mental health options among childhood violence exposure groups could lead to better understanding of the relationship between specificity of childhood violence exposure and current levels of distress. Previous studies neglected to assess individuals on psychological distress, or to determine if there was a relationship among childhood violence exposure, selection of coping strategies and mental health treatment seeking, and PTSD.

Present Study

The present study is a secondary analysis that seeks to examine PTSD, coping, and mental health treatment approaches among four groups of pregnant women in a community sample: witnesses of inter-personal violence (witness) in childhood, survivors who experienced child abuse (abused), survivors of child abuse who also witnessed IPV (combined), and a comparison group that did not experience either type of childhood violence exposure. This study aims to examine the difference between direct exposure to violence (i.e., child abuse) and indirect exposure (e.g., witnessing IPV), and its additive effects on risk for PTSD-related outcome variables taking adult abuse exposures and other non-abuse trauma exposures into account. Additionally, this study aims to explain whether child victimization group membership is correlated with differences in coping strategies, and mental health treatment seeking. The main research questions and hypotheses investigated in the present study are the following.

First, after controlling for adult interpersonal violence, the sum of other (non-abuse) trauma exposures across the lifespan, and demographic variables, this study examines the extent to which group membership is related to PTSD-related outcome variables (i.e., lifetime and current PTSD diagnoses, number of PTSD symptoms, PTSD distress severity, and PTSD symptom criteria of re-experiencing, avoidance/numbing, and hyperarousal). It was hypothesized that when comparing individuals based on witnessing, experiencing or combined exposure, the four groups (i.e., witness, abused, combined, and comparison groups) will differ in PTSD distress severity. It was hypothesized that individuals from the combined group are the most symptomatic, experience the most distress, suffer impairment in the most domains, endorse the greatest number of symptoms in each or most often meet criteria in all three PTSD symptom criteria (re-experiencing in cluster B, avoidance/numbing in cluster C, and hyperarousal in cluster D), and have the highest incidence of life-time PTSD relative to the other groups. It was further hypothesized that the abused group will suffer more current distress than the witness group (as found in prior child research), and that the comparison group will have the least distress.

Second, after controlling for demographics and other covariates (e.g., adult interpersonal violence), this study examines the relationship between group status and the selection of coping strategies, and mental health treatment seeking or help-seeking. Specifically, this study examines if the above-identified groups differ in their selection of coping strategies and mental health treatment approaches. It was hypothesized that group membership will be associated with patterns of selection, as well as the specific mental health help-seeking approaches tried.

Method

The present study is a secondary analysis utilizing data collected as part of a larger investigation, the Stress, Trauma, Anxiety, and the Childbearing Year Project (STACY; NIHR01-NR008767). STACY is a prospective, multiple-cohort study that is examining the relationship between PTSD and adverse outcomes from early pregnancy through the postpartum period. Data presented here were collected during the first wave of the data collection between the years 2005 and 2008.

Participants

Participants are pregnant women sampled from three hospitals located in the Detroit-Ann Arbor area of Michigan. In order to be eligible to participate in the study, women were required to be 18 years or older, able to speak English without an interpreter for a telephone survey, expecting their first child, and entering prenatal care at less than 27 completed weeks of gestation. Participants were invited to participate in a study of "stressful life events that happen to women, emotions, and pregnancy" by nurses conducting the initial intake and health history interviews with all new prenatal care patients.

Procedure

After potential participants were invited to participate in the study, the nurse gave interested women an initial information document (written at a 7th grade level) and the clinician recorded their contact information. This contact information was faxed to the survey research company, DataStat. If the women did not have a phone, she was able to call DataStat's toll-free number to enroll and participate in the study. DataStat is a health services research company that specializes in health and mental health telephone interview surveys, and they are responsible for computer aided telephone interview (CATI) surveys, data management, and participant tracking and payment across three survey data collection

points. An initial verbal informed-consent was taken at first contact with DataStat at the onset of the phone call, and a standardized survey was administered by phone. The CATI system structured the interview and recorded the data simultaneously. Ten percent of interviews were audited for interaction quality and accuracy of data entry across the life of the study. The primary goal of the interview was to collect indicators of trauma and PTSD, and to assign participants to cohorts: PTSD-positive, partial PTSD, trauma-positive but PTSD-negative, and never exposed. At the conclusion of the interview, all respondents received a mailing which included an incentive payment and other materials depending on their participation in the later phases. A cadre of 13 research interviewers was given project-specific training and conducted this project's calls. This interview lasted an average of 33 minutes, and participants were sent a $20 check by mail for their participation in the study.

Measures

The *Life Stressor Checklist –Revised* (LSC-R; Wolfe & Kimerling, 1997) assesses lifetime exposure to 30 potentially traumatic events specific to women's experiences (e.g., miscarriages, sexual assaults, muggings). One item is excluded because it does not apply to this sample (i.e., involves giving up a child or losing it to death, and our sample was limited to having one's first child). Age of the exposure is ascertained in relation to the women's worst and second worst traumatic event. Data for this analysis were from the 1,258 women who had completed the early pregnancy (first) survey as of January, 2008. Detailed information about recruitment and completion rates are published elsewhere (Seng et al., under review). Of the five instruments most frequently used in research to measure trauma

exposures, the LSC-R is the one with highest sensitivity to trauma among women (Cusack, Falsetti, & de Arellano, 2002).

This instrument has been modified in two ways. First, alternative wording was added for the item that assessed which of any endorsed traumas was the "worst." The interviewer read the list of traumas so that the participant could just say 'yes' when the interviewer read the participant's worst trauma. This modification allowed the participant to avoid stating the worst trauma aloud, which ensured greater privacy in case someone was nearby her at the time of the interview. This prevented an outside listener from knowing the topic of the interview since all other trauma and PTSD items are in yes/no format. Second, the study interwove detailed follow-up items from the Abuse Assessment Screen (AAS) into this instrument. This was because the current domestic violence items of the LSC query the same adult abuse events as the AAS and the AAS asks for more information about violence occurring around the time of pregnancy. The validity of the trauma history instruments could not be determined because there was no corroboration of the actual traumatic events from other sources.

The *Abuse Assessment Screen (AAS;* McFarlane, Parker, Soeken, & Bullock, 1992*)* is a domestic violence screening tool designed for use with pregnant women. The AAS meets the quality criteria for trauma measures, using behaviorally specific wording, non-legal language, and asking about a range of abuse that occurs in intimate partner relationships. Limits to ability to assess validity and reliability of this instrument parallel those of other trauma instruments, but test-retest reliability and criterion-related validity tests were attempted (Beck, et al., 1999). Test-retest reliability done in one sample (n=48) within the same trimester indicated agreement of 83%, with an unknown proportion of the difference

potentially due to interim instances of abuse. In a second sample (n=40) where interim abuse was ascertained, agreement was 100% and then excluded from the reliability calculation. Criterion validity was assessed in relation to three widely used instruments not specific to abuse occurring around the time of pregnancy (the Conflict Tactic Scale, Index of Spouse Abuse, & Danger Assessment). Correlations among instruments varied due to differences in wording and types of abuse assessed (e.g., correlation of 0.13 for verbal abuse, 0.37 for severe violence), but agreement was 96% between similarly worded items about severe abuse. The AAS probes were interwoven with the Life Stressor Checklist adult abuse items to elicit greater detail about violence that could be occurring around the time of pregnancy.

The *National Women's Study PTSD Module (NWS-PTSD;* Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993) is a version of the Diagnostic Interview Schedule (DIS) that was modified for use in the largest epidemiological study of PTSD specific to women that was conducted via the National Crime Victim Center (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). It is designed as a structured telephone diagnostic interview to be administered by lay interviewers. Kilpatrick and colleagues (1998) validated this measure in a primarily clinical sample of 528 women during the DSM-IV PTSD Field Trial in comparison with the face-to-face, clinician-administered Structured Clinical Interview for DSM-IIIR (Spitzer, Williams, & Gibbon, 1987). The kappa coefficient for agreement between the two instruments was 0.77. The NWS-PTSD module attained a sensitivity of 0.99 and specificity of 0.79 compared with the SCID (Resnick, Kipatrick, Dansky, Saunders, & Best, 1993; Kilpatrick, Resnick, Freedy, Pelcovitz, Resick, Rother, & van der Kolk, 1998; Spitzer, Williams, & Gibbon, 1987). The NWS-PTSD measures all 17 symptoms of PTSD for lifetime and current occurrence with follow-up items to assess greater than one-month

duration of the syndrome of symptoms, distress, and impairment in relation to school, occupational, and family role functioning. It yields a dichotomous diagnosis and continuous symptom count. For the present study, Cronbach's alpha was calculated for symptom criteria B (re-experiencing symptoms; α=0.74), C (avoidance and numbing symptoms; α=0.76), and D (hyperarousal symptoms; α=0.67), and the entire scale (α=0.88).

The *Pregnancy Risk Assessment Monitoring System (*PRAMS; Beck, et al., 1999*)* is an epidemiological surveillance research instrument created by the CDC to collect perinatal data routinely across the U.S. This study utilized the standardized items that assess for sociodemographic factors (i.e., education, employment status, ethnicity, income, relationship status, living situation, and weeks of pregnancy), and health risk behaviors (Beck, et al., 1999).

Mental health treatment history was assessed by nine investigator-generated items about past individual and group therapy, marital/family therapy, support groups, and prescription medications, as well as use of self-help materials, herbal remedies, pregnancy therapy, or pregnancy medications. Participants indicated if they used each type of mental health approach by responding to each item with a "yes" or "no."

Coping was assessed by a list of eleven investigator-generated items of coping behaviors based on PTSD specific literature on adult coping behaviors, including using alcohol, tobacco, or recreational drugs; speaking with friends or a significant other; crying, sleeping, or praying; distracting with entertainment or work; and walking/light exercise or strenuous exercise. Participants indicated if they used each type of coping behavior to cope with the posttraumatic distress by responding to each item with a "yes" or "no."

The *World Health Organization Composite International Diagnostic Interview* (WHO CIDI, 1990) is a comprehensive and structured psychiatric diagnostic interview designed to assess mental disorders according to the definitions and criteria of ICD-10 and DSM-IV, based on the World Health Organization's Composite International Diagnostic Interview (WHO CIDI, 1990). It is designed to allow the instrument to be administered by trained interviewers who are not clinicians. This instrument is commonly included in population surveys because it is supported by extensive Field Trial data on cross-national reliability and validity. Internal consistency coefficients for these modules range from 0.67-0.97. Test-retest agreement ranged from 0.89 (anxiety) to 0.97 (somatization) (Wittchen, 1994). There were no differences between clinician and non-clinician diagnosing with the CIDI. This study used only modules for assessing anxiety, depression, somatization, and substance abuse disorders and overall impairment.

Data Reduction and Analytic Strategy

Participants were divided into four groups (i.e., witness, abused, combined, and comparison) based on responses to the LSC items related to violence exposure (i.e., child abuse and witnessing). For membership in the witnesses group, a participant needed to endorse the item asking the participant if she witnessed domestic violence before the age of 16. For membership in the abused group, participants needed to endorse the following items as having occurred prior to age 16 as well: emotional abuse, physical neglect, physical abuse (when younger than 16 years old), childhood sexual abuse or contact, and childhood sexual abuse or penetration. For membership in the combined group, individuals had to endorse the domestic violence witness item and one of the abused items. For membership in the comparison group, individuals did not endorse witnessing domestic violence or

experiences of abuse before age 16. For the purposes of this study, we additionally generated two variables from data collected by the LSC. First, a non-abuse lifetime trauma exposure score (LNAT sum) was calculated by adding the number of types of other traumatic events (e.g., accidents and disasters) that individually our cumulatively could account for outcomes. Second, an adult interpersonal violence score (A-IPV sum) was calculated by adding the number of types of adult abuse events (e.g. sexual or physical IPV, rape, events experienced after the age of 16).

Differences in descriptive characteristics (education, employment status, ethnicity, income, relationship status, living situation, weeks of pregnancy and psychiatric sequelae that are often comorbid with PTSD, such as major depression, generalized anxiety disorder, and substance abuse) between participants across groups were compared utilizing analysis of covariance for continuous variables and chi squared tests (or Fisher's exact test for fewer than five observations per cell) for dichotomous variables. A cumulative index of socio-demographic disadvantage was generated by the parent study to be used across studies as a proxy for additive risk for perinatal outcomes. This index adds the total number of the following items that were endorsed: teen pregnancy, African-American ethnicity, income less than $15,000 per year, less education than high school, and seeking prenatal care in the center city as a proxy for living in the inner-city of Detroit. This index ranged between zero and five.

Potential multicollinearity were assessed by conducting collinearity diagnostics, examining tolerance and VIF values, and then regression analyses were re-conducted excluding those problematic variables. The resulting VIF values and standard errors were then examined to determine if the variable should be included or excluded from the final

models. All statistical analyses were accomplished using SPSS 17.0. The threshold for significance was set at $p < .05$ (two-tailed). The following statistical strategy was utilized to test the above-mentioned hypotheses.

First, this study examined if childhood victimization (CV) group membership was related to PTSD-related variables (i.e., lifetime and current PTSD diagnoses, number of PTSD symptoms, PTSD distress severity, domains of PTSD-related impairment, and PTSD symptom criteria) after controlling for lifetime non-abuse trauma exposure (LNAT), adult interpersonal violence exposure (A-IPV), and taking cumulative sociodemographic disadvantage into account. For these analyses, we utilized multiple logistic and forced-entry regression analyses. The group variable was entered as a single categorical variable in the logistic regression models with the non-exposed comparison group as the reference category. In the linear regression models, the groups were entered as a series of dummy variables contrasting each focal group with all others.

Second, this study tested the relationship between group status, PTSD-related variables (i.e., lifetime PTSD diagnoses, number of PTSD symptoms, PTSD distress severity, domains of PTSD-related impairment, and PTSD symptom criteria), coping strategies, and mental health treatment options. To determine if groups differ based on their selection of coping strategies and mental health treatment options, this study conducted chi square analyses.

Results

Descriptive Statistics for Entire Sample

Table 1 presents the descriptive statistics for this sample. The original sample consisted of 1,259 pregnant women from the Southeast Michigan area. The mean age of

participants was 26 years. Participants endorsed identities of Latina (4.3%), Middle Eastern (2.3%), Asian (7.5%), African American (45%), European American (45.1%), Native American/Alaskan Native (1.5%), and Native Hawaiian/Pacific Islander (0.6%). Approximately 23% (n=284) were earning an average income of less than $15,000 per year, and 47.1% (n=593) received a high school degree or less education than a high school degree. Approximately 60.4% of participants (n=760) were currently in romantic relationship. Thus, on the cumulative sociodemographic risk measure, the average score was 1.85. Across the sample, 12.2% (n=153) met the criteria for major depressive disorder (MDD) and 4.4% (n=56) met criteria for generalized anxiety disorder (GAD).

[Insert Table 1 Here]

Trauma-related Variables for Entire Sample

Among the 1,259 participants, 20.8% (n=263) reported witnessing IPV in childhood, 7.9% (n=100) reported experiencing child abuse, 13.6% (n=171) reported both witnessing IPV and experiencing child abuse, and 57.6% (n=725) reported experiencing none of the previously mentioned childhood traumatic events. Participants generally reported an average of 3.5 types of non-abuse lifetime traumatic events and 0.22 types of adult abuse-related traumatic events. Approximately 8.7% (n=109) met criteria for a current PTSD diagnosis, and 20.3% (n=255) met criteria for lifetime PTSD diagnosis.

Comparing CV Groups

Sociodemographics. Table 1 presents comparisons between the CV groups across demographic variables. Participants in the witness and combined groups were found to be significantly more disadvantaged; they were younger, earned less income, were less educated,

and were less likely to currently be in a partnered relationship when compared to their counterparts in the abused and comparison groups. Thus, witnessing was associated with sociodemographic disadvantage but abuse alone was not.

Table 1 presents information on ethnic characteristics in the sample. Significant differences between groups on their ethnic composition were found. Women in the witness and combined groups were significantly more likely be African American while abused and comparison groups were significantly more likely to be European American and Asian American. No significant difference between groups in the number of participants who endorsed identities of Latina, Middle Eastern, and Native Hawaiian/Pacific Islander were found.

Non-PTSD Psychiatric Characteristics. Table 2 presents group comparison on the incidence in the past year of Major Depressive Disorder (MDD) and Generalized Anxiety Disorder (GAD) in the sample. Women in the abused and combined groups were found to have significantly higher incidence of MDD and GAD when compared to the witness and the comparison group. These results are presented in Table 2.

[Insert Table 2 Here]

Exposure to Other Trauma. We also compared the groups on rates of other traumatic events reported. Adult abuse traumatic events (e.g., rape, inter-partner violence, and assault after the age of 16) and non-abuse trauma events (e.g., natural disaster or car accidents at any time in the participant's life) were surveyed. These results are presented in Table 2 and discussed below.

Adulthood Abuse Trauma. The three CV groups reported significantly more adulthood abuse trauma exposure than the control group. The combined group endorsed significantly

more adulthood abuse trauma than the witness group, means of .52 and .29 respectively, but did not significantly differ from the abused group, mean of .31. There were no significant differences between the abused and witness groups on exposure to adulthood abuse trauma. However, the rates of adulthood abuse trauma were very low (means ranging from .1 to .51) so the differences may not be meaningful.

Lifetime Non-Abuse Trauma. The three CV groups had significantly more lifetime non-abuse trauma exposure than the control group. The combined group had significantly more lifetime non-abuse trauma exposure than the abused and witness groups, means of 5.32, 4.38, and 4.22 respectively, while the abused and witness groups were statistically indistinguishable. Table 3 presents the frequencies of the lifetime non-abuse trauma exposure by group.

[Insert Table 3 Here]

Relationship between CV and PTSD symptoms

To examine the contribution of CV and lifetime and current PTSD symptom counts in this sample, bivariate and forced-entry multiple regression analyses in which predictors were entered in steps and were conducted. The bivariate analyses findings are presented in Table 4. These analyses found that all the proposed main predictors were significantly related to the PTSD outcomes bivariately, except for witness. Witnessing was only significantly related to hyperarousal symptoms, but not to the other PTSD outcomes.

[Insert Table 4 Here]

The two forced-entry, multiple regression analyses in which predictors were entered in steps and predicting lifetime and current PTSD symptom count followed the same structure. Cumulative disadvantage was entered in Step 1 and CV was entered in Step 2 as a

dichotomous variable. At Steps 3 and 4, lifetime non-abuse trauma and adulthood abuse trauma were respectively entered into the model. In addition to examining whether each successive step improved the prediction of a given outcome, individual predictors were examined for their relationship to the outcome. Results for regression analyses predicting lifetime and current PTSD symptom count are presented in Table 5.

[Insert Table 5 Here]

Both analyses yielded similar findings. Cumulative disadvantage entered into Step 1 accounted for a significant proportions of variance in lifetime and current PTSD symptom count ($R^2 = 0.04$ and 0.13 respectively, $p<0.001$) and remained significant throughout each step. Once CV was entered into Step 2, there was a significant increment in the amount of variance explained in both lifetime and current PTSD symptom counts ($R^2 = 0.18$ and 0.23 respectively, $p<0.001$); all three CV groups were found to significantly predict both PTSD symptom counts at step 2. At Step 3, lifetime non-abuse trauma was entered and contributed to another substantial increase in variance in both lifetime and current PTSD symptom counts ($R^2 = 0.32$ and 0.30 respectively, $p<0.001$). However, cumulative disadvantage, abused, and combined groups remained significantly related to lifetime and current PTSD, while witness was no longer significantly related to these PTSD symptoms at step 3. When adulthood abuse trauma was entered into the final step, the models predicting lifetime and current PTSD symptom count gained significant variance ($R^2 = 0.35$ and 0.32 respectively, $p<0.001$).

In the final model for lifetime PTSD symptom count, all predictors except witnessing were found to significantly predict symptom count: cumulative disadvantage ($\beta=0.05$), abused group ($\beta =0.13$), combined group ($\beta=0.19$), lifetime non-abuse trauma

(β=0.39), and adulthood abuse trauma (β=0.15). The combined group (β=0.19) is only slightly more influential in explaining symptom count than abuse alone (β =0.13). Moreover, lifetime non-abuse trauma was found to be the strongest predictor (β=0.39) and accounted for the largest change in variance (ΔR^2=0.14). Additionally, cumulative disadvantage appeared to become less significantly related to the outcome (p=0.04) after accounting for both lifetime non-abuse trauma and adulthood abuse trauma.

The final model for current PTSD symptoms also found all predictors except witness to significantly predict the outcome: cumulative disadvantage (β=0.25), abused group (β =0.09), combined group (β=0.18), lifetime non-abuse trauma (β=0.30), and adulthood abuse trauma (β=0.11). For this model, the combined group (β=0.18) had approximately twice the influence in explaining symptom count than abused (β =0.09); however, cumulative disadvantage (β=0.25) and lifetime non-abuse trauma (β=0.30) have stronger associations with current PTSD symptom count than the most predictive CV group, which was the combined group (β=0.18).

Lifetime Non-abuse Trauma as Mediator. As seen in Table 5, the regression analyses suggest that lifetime non-abuse trauma was significantly related to current PTSD symptom count, and a potential mediator between witnessing and current PTSD symptoms when this outcome is regressed on the model. In Step 2, witnessing is significantly related, β=0.08, p=0.004. However, when lifetime non-abuse trauma was added in step 3, witnessing lost its significant relationship with current PTSD symptoms, β=0.01, p=0.07. According to Baron and Kenny's approach (1986) for testing statistical mediation, three conditions must be satisfied. First, the predictor must be significantly related to the outcome. The beta weight associated with witnessing adjusted for sociodemographic disadvantage and the other CV

groups is .08, p <.05, for current PTSD and .13, p <.001 for lifetime PTSD. This first condition is satisfied. Second, the predictor must be significantly related to an intervening potential mediator, in this case lifetime non-abuse trauma. The beta weight associated with witnessing adjusted for sociodemographic disadvantage and the other CV groups in a regression where lifetime non-abuse trauma was the outcome (not tabled) is .21, p <0.001, for current PTSD and .08, p=0.004, and .13 with p <0.001 for lifetime PTSD. This second condition is acheived. Third, the predictor's relationship to the outcome must lose significance when the potential mediator is entered as a covariate. The beta weight associated with witnessing adjusted for sociodemographic disadvantage reduced to .01, p >.05 for current and .04, p > .05 when lifetime non-abuse trauma is entered to predict PTSD. The beta weight associated with lifetime non-abuse trauma adjusted for sociodemographic disadvantage is .32 with p<.001 for current PTSD and .42 with p <.001 for lifetime PTSD. The third condition is satisfied.

Thus, lifetime non-abuse trauma is a mediator between witness and current PTSD status. Lifetime non-abuse trauma does not meet criteria for mediating other abused or combined groups; it has associations with PTSD but appears to moderate this risk, as evidenced by the decrease in beta from Step 2 to Step 3 in both current and lifetime PTSD models. Thus, the relationships between lifetime non-abuse trauma, witness, and current PTSD symptom count follow a mediation pattern. We conclude that witnessing alone is a weak predictor and lifetime non-abuse trauma is a better predictor of PTSD symptoms, but that they co-vary in current PTSD symptoms.

In sum, while CV group status contributed to lifetime and current PTSD symptom levels, witnessing was no longer significantly related to these PTSD symptom levels as soon

as other exposures are taken into account. Sociodemographic disadvantage is more strongly associated with risk for current PTSD symptom level than lifetime PTSD symptom count. Lifetime non-abuse trauma is the strongest predictor of both lifetime and current PTSD.

Relationship Between CV and PTSD Symptom Criteria

The impact of particular CV-exposure on specific PTSD DSM-IV symptom criteria clusters (reexperiencing in Cluster B, avoidance/numbing in Cluster C, and hyperarousal in Cluster D) currently experienced were examined utilizing three forced-entry, multiple regression analyses. Table 5 presents the regression models for these analyses predicting the total number of symptoms in each of the three PTSD symptom criteria. Independent predictors were entered in four blocks in the same manner as above for lifetime and current PTSD symptom counts: cumulative disadvantage, CV groups, LNAT, and AAT.

[Insert Table 6 Here]

In an examination of the three models, the findings across the cluster outcomes were very similar. All predictors except WIPV were found to be significantly associated with criteria B (reexperiencing) and C (avoidance/numbing) symptom counts; however, when predicting criterion D (hyperarousal) symptoms, the abused group was no longer significantly associated as well. The combined group was substantially more powerful in explaining criteria symptom count than abuse alone based on the standardized beta values. Moreover, LNAT was found to be the strongest predictor (β=0.39) and accounted for the largest change in variance (ΔR^2=0.14). Across all three criteria, lifetime non-abuse trauma again had the strongest independent association.

Relationship Between CV and PTSD Caseness

Logistic regression analyses were employed to ascertain if specific CV groups were more strongly associated with lifetime and current PTSD diagnoses in our sample. Independent predictors were entered in four blocks in the same manner as above for lifetime and current PTSD symptom counts: cumulative disadvantage, CV groups, LNAT, and AAT. These analyses are presented in Table 6. In the final step of the model predicting lifetime PTSD diagnosis, all predictors except WIPV and cumulative disadvantage were found significant. In contrast, all predictors except WIPV were found to be significantly associated with a current PTSD diagnosis. Unlike previous analyses, WIPV is not found to be significant at any step of the logistic regression model predicting a current PTSD diagnosis.

[Insert Table 7 Here]

Relationship between CV and Coping.

Linear and logistic regression analyses were utilized to examine the relationship between CV and specific coping strategies. These results are presented in Table 7. Again, independent predictors were entered in four blocks in the same manner as above for the previous analyses: cumulative disadvantage, CV groups, LNAT, and AAT. These analyses found that CV group membership did not significantly predict the following coping strategies: speaking to a friend or significant other, praying, or light and strenuous exercise. CV group status did predict the following coping strategies: number of types of drugs used, alcohol use, tobacco use, recreational drug use, and crying. The entire model for number of drugs used for coping explained 11.6% of the variance, and being in the abused group was more strongly associated with using drugs for coping (β=0. 14) than the Combined group (β=0. 08) and the WIPV group (β=0. 06). Being in the abused group was most predictive

of alcohol use (O.R.= 2.69), tobacco use (O.R.= 2.57), recreational drug use (O.R.= 3.15), work as a distraction (O.R.= 1.67), and sleep (O.R.= 2.21) for coping. Only WIPV predicted crying to cope (O.R.=1.7) and only the Combined group predicted using entertainment as a distraction to cope (O.R.=1.68).

[Insert Table 8 Here]

Relationship Between CV and Selection of Mental Health Treatment.

Logistic regression analyses were used to examine the association between CV group status and the selection of specific mental health treatment strategies. These analyses are presented in Table 8. Independent predictors were entered in four blocks in the same manner as above: cumulative disadvantage, CV groups, LNAT, and AAT. These analyses found that CV group membership did not significantly predict the following mental health treatment strategies: attending support groups, utilizing herbal or prescription medications, and pregnancy therapy or medications. CV group status did predict the following mental health treatment strategies: engaging in individual therapy, engaging in group therapy, engaging in martial/family therapy, reading self-help books, and therapy in pregnancy. The abused group was most likely to use marital/family therapy (O.R.= 2.71), while the Combined group was most likely to use reading self-help books (O.R.= 2.67). Only the abused group predicted engaging in individual therapy (O.R.=2.93), while only the Combined group predicted engagement in group therapy (O.R.= 2.26) and therapy while pregnant (O.R.= 2.31) .

[Insert Table 9 Here]

Discussion

Previous research on childhood victimization documented that childhood violence exposure was related to multiple deleterious outcomes in adulthood (e.g., Cicchetti, 1989; Cicchetti & Lynch, 1995; Lieberman, 2004; Shonk & Cicchetti, 2001; Stafford, Zeanah, & Scheeringa, 2003). The present study extends those findings and finds that specific forms of childhood violence exposure predict the PTSD outcomes associated in a community sample of pregnant women. Overall, CV was related to both current and lifetime PTSD severity and caseness, as seen in prior research (e.g., Haugaard, 2004; Kilpatrick, Ruggiero, et al., 2003). However, specific forms of CV exposure varied in influence on PTSD outcomes. As hypothesized, women exposed to both direct and indirect forms of violence exposure (the Combined group) endorsed the greatest number of PTSD symptoms currently and in their lifetime; endorsed the greatest number of reexperiencing, avoidance/numbing, and hyperarousal symptoms; and have the highest incidence of current and life-time PTSD relative to the other groups. As predicted, the results discussed above also show that the abused group suffered more current and lifetime distress than the witness group, and that the comparison group reported the least distress. Additionally, witnessing alone was not predictive of PTSD symptom count, PTSD diagnoses, or PTSD symptom expression by cluster, but abused was predictive of all three types of outcomes. Still, the combined exposures were more predictive than abuse exposure alone.

There are multiple possible explanations for these findings. Perhaps direct victimization (as occurred in the abused group) is a sufficient cause of PTSD whereas indirect exposure to violence (as occurred in the witness group) was not. However, once exposed to abuse, other exposures and stressors may have an additive influence.

These findings may also suggest that there is either an interaction between abuse alone and witnessing alone, or that witnessing is a proxy for other factors. In other words, witnessing may only exert a synergistic influence when direct victimization (abused) occurs, but not when only indirect violence (witness) occurs. Perhaps the injury to one's self and the threat to one's life are more powerful than witnessing a loved one injured or threatened. Witnessing is strongly associated with sociodemographic disadvantage and more lifetime non-abuse trauma in this sample. Our analyses suggest that, for those whose only early violence exposure is witnessing, sociodemographic disadvantage and lifetime non-abuse trauma are more important risk factors for PTSD. However, for those who experience abuse alone, all three factors and adulthood abuse trauma contribute to increased risk for PTSD. This may imply that witnessing and direct experiences of violence appear to differentially affect risk for developing or maintaining PTSD. In our sample, witnessing did not appear to reach such a threshold when it was the only intra-familial violence exposure. However, it contributed in an additive manner analogous to a kindling model in which each additional exposure (i.e., witnessing) adds to risk and severity. Our study's finding that witnessing did not independently and significantly predict PTSD contradicts previous research (e.g., Feerick & Haugaard, 1999, Maker et al., 1998, Silvern et al., 1995; Briere & Runtz, 1990). However, these earlier studies were not conducted with community samples and did not factor in other types of violence exposure, such as adulthood assault histories.

Additionally, the finding that cumulative lifetime non-abuse trauma is the strongest predictor of both lifetime and current PTSD, was unanticipated. This finding calls into question the assumption that violence and abuse is linked to worse outcomes than other types of trauma. Perhaps this finding can be explained by these events' potential temporal

recency; potentially these memories were more memorable due to their proximity to the interview and this was a result of a reporting bias, or perhaps those events that were most recent will be most closely related to symptom expression. Based on a closer examination of the frequencies of lifetime non-abuse trauma (table 3), when lifetime non-abuse trauma events are related to violence and abuse, all groups follows the general dose response pattern. However, it appears that when the lifetime non-abuse trauma events are related to sociodemographic disadvantage (e.g., family member jailed), the abused group may be buffered and do better than the other groups.

Finally, this study explored the relationship among group status, and the selection of coping strategies, and mental health treatment seeking or help-seeking. Generally, group membership was associated with patterns of selection of specific coping strategies; abuse-only exposure appeared to be related to more substance use broadly (e.g., medications use, alcohol use, tobacco use, and recreational drug use), as well as forms of distractions (e.g., work and sleep) while WIPV only predicted crying to cope and the Combined exposure was linked to using entertainment to cope. The patterns of selection for specific mental health help-seeking approaches tried were more mixed across CV groups. The direct abuse was found most related to engagement in marital/family and individual therapies, while those in the combined group more often engaged in group therapy, therapy while pregnant, and reading self-help books. Witnessing was not as strongly linked to specific mental health treatment modalities.

Limitations

This study does have notable limitations. First, the sample was comprised of pregnant women and may not be generalizable to all women or across genders. Second, the measures

of violence exposure did not specify the exact nature or severity of the violence exposure. Thus, it is unclear whether those who reported violence histories were experiencing violence that would meet PTSD diagnostic A1 or A2 criteria, unless the witnessing IPV, experiencing child abuse, or adult abuse trauma were considered by the respondent to be her worst or second worst exposure. Third, the protocol did not include items more specific to determining protective factors (i.e., role of social support). Thus, the parent study does not contribute strongly to understanding why some individuals who experienced various forms of trauma exposure were resilient, while others were not. Finally, this study relies on self-report and retrospective data, and therefore may not be accurate.

However, there also are important strengths. First, we were able to model two important confounds: adulthood trauma exposure and other childhood trauma exposure. Second, the sample size was adequate to include a large number of participants in each of the CV groups, strengthening inference about the specific effects of these categories of childhood violence exposure on adult PTSD. Third, these data fill a gap in our understanding of risk for PTSD conveyed by these indirect and direct childhood violence exposures by studying a large community sample, rather than a clinical sample.

Directions for Future Research

From these survey data, we were not able to learn what distinguishes those who witness IPV as their only intra-familial violence from those who were directly abused, nor were we able to learn why witnessing IPV appears, in some models, to perhaps convey some resilience. Qualitative studies with adult women who witnessed IPV might advance a theory of resilience for girls in this situation. Future research should extend this analysis to study men so that patterns can be determined which are gender-specific. Potential contributors to

staying safe from direct abuse and to resilience from the psychiatric sequelae of witnessing IPV should be included in future studies. Examples of such factors might include the presence of supportive extended family members, mothers who escape the violence, fathers who are treated, mental health treatment for the child soon after the exposure(s), and a child's ability to succeed socially outside the home.

Clinical Implications

This study does suggest that clinical practice with individuals with PTSD may benefit from assessing trauma exposure across the lifespan and across types (e.g., war, disasters, and accidents), and to not only focus on recent and/or childhood violence exposure. History taking that uses a framework eliciting additive experiences may be more informative. These data particularly point to the contribution of multiple lifetime non-abuse exposures to development and persistence of PTSD among childhood victims of violence.

References

American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.

Appel, A. E., and Holden, G. W. (1998). The co-occurrence of spouse and physical child abuse: A review and appraisal. *Journal of Family Psychology, 12*(4), 578-599.

Bagley, C., and McDonald, M. (1984). Adult mental health sequels of child sexual abuse, physical abuse and neglect in maternally separated children. *Canadian Journal of Community Mental Health, 3*, 15-26.

Beers, S. R., and De Bellis, M. D. (2002). Neuropsychological function in children with maltreatment-related posttraumatic stress disorder. *American Journal of Psychiatry, 159*(3), 483-486.

Beck LF, Morrow B, Lipscomb LD, Johnson CH, Gaffield ME, Rogers M, and Gilvert BC (1999). Prevalence of selected maternal behaviors and experiences, Pregnancy Risk Assessment Monitoring System (PRAMS). Morbidity & Mortality Weekly Reports April 26, 2002 / 51(SS02); 1-26.

Bifulco, A., Moran, P. M., Baines, R., Bunn, A., and Stanford, K. (2002). Exploring psychological abuse in childhood: II. association with other abuse and adult clinical depression. *Bulletin of the Menninger Clinic, 66*(3), 241-258.

Boney-McCoy, S., & Finkelhor, D. (1996). Is youth victimization related to trauma symptoms and depression after controlling for prior symptoms and family

relationships? A longitudinal, prospective study. *Journal of Consulting and Clinical Psychology, 64*(6), 1406-1416.

Bremner, J. D., Southwick, S. M., Johnson, D. R., Yehuda, R., and Charney, D. S. (1993). Childhood physical abuse and combat-related posttraumatic stress disorder in vietnam veterans. *American Journal of Psychiatry, 150*, 235-239.

Brewin, C. R., Andrews, B., and Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*(5), 748-766.

Briere, J., and Elliot, D. M. (1993). Sexual abuse, family environment and psychological symptoms: On the validity of statistical control. *Journal of Consulting and Clinical Psychology, 61*, 284.

Briere, J., and Runtz, M. (1990). Differential adult symptomatology associated with three types of child abuse histories. *Child Abuse and Neglect, 14*(3), 357-364.

Brown, G. R., and Anderson, B. (1991). Psychiatric morbidity in adult inpatients with childhood histories of sexual and physical abuse. *American Journal of Psychiatry, 148*(1), 55-61.

Carlson, E. B., Furby, L., Armstrong, J., & Shlaes, J. (1997). A conceptual framework for the the long-term psychological effects of traumatic childhood abuse. *Child Maltreatment, 2*(3), 272-295.

Christopher, M. (2004). A broader view of trauma: A biopsychosocial-evolutionary view of the role of the traumatic stress response in the emergence of pathology and/or growth. *Clinical Psychology Review, 24*(1), 75-98.

Cappell, C., and Heiner, R. B. (1990). The intergenerational transmission of family aggression. *Journal of Family Violence, 5*(2), 135-152.

Cicchetti, D., and Lynch, M. (1995). Failures in the expectable environment and their impact on individual development: The case of child maltreatment. In D. Cicchetti, and D. J. Cohen (Eds.), *Developmental psychopathology, vol. 2: Risk, disorder, and adaptation.* (pp. 32-71). Oxford, England: John Wiley and Sons.

Cusack, K., Falsetti, S., and de Arellano, M. (2002). Gender considerations in the psychometric assessment of PTSD. In R. Kimerling, P. Ouimette and J. Wolfe (Eds.), *Gender and PTSD.* (pp. 150-176). New York, NY, US: Guilford Press.

Davies, C. A., DiLillo, D., and Martinez, I. G. (2004). Isolating adult psychological correlates of witnessing parental violence: Findings from a predominantly latina sample. *Journal of Family Violence, 19*(6), 377-385.

De Bellis, M. D. (2001). Developmental traumatology: The psychobiological development of maltreated children and its implications for research, treatment, and policy. *Development and Psychopathology, 13*(3), 539-564.

De Paúl, J., Milner, J. S., and Gica, P. (1995). Childhood maltreatment, childhood social support, and child abuse potential in a basque sample. *Child Abuse and Neglect, 19*, 907.

Doumas, D., Margolin, G., and John, R. S. (1994). The intergenerational transmission of aggression across three generations. *Journal of Family Violence, 9*(2), 157-175.

Downs, W. R., Capshew, T., & Rindels, B. (2004). Relationships between Adult Women's Alcohol Problems and Their Childhood Experiences of Parental Violence and Psychological Aggression. *Journal of Studies on Alcohol, 65*(3), 336-344.

Fantuzzo, J. W., DePaola, L. M., Lambert, L., Martino, T., Anderson, G., & Sutton, S. (1991). Effects of interparental violence on the psychological adjustment and competencies of young children. *Journal of Consulting and Clinical Psychology, 59*(2), 258-265.

Feerick, M. M., and Haugaard, J. J. (1999). Long-term effects of witnessing marital violence for women: The contribution of childhood physical and sexual abuse. *Journal of Family Violence, 14*(4), 377.

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21*(3), 219-239.

Forsstrom-Cohen, B., and Rosenbaum, A. (1985). The effects of parental marital violence on young adults: An exploratory investigation. *Journal of Marriage and the Family, 47*, 467-472.

Graham-Bermann, S. A., & Levendosky, A. A. (1998). Traumatic stress symptoms in children of battered women. *Journal of Interpersonal Violence, 13*(1), 111-128.

Haugaard, J. J. (2004). Recognizing and treating rare behavioral and emotional disorders in children and adolescents who have been severely maltreated: Schizophrenia. *Child Maltreatment, 9*(2), 161-168.

Henning, K., Leitenberg, H., Coffey, P., Bennett, T., and Jankowski, M. K. (1997). Long-term psychological adjustment to witnessing interparental physical conflict during childhood. *Child Abuse and Neglect, 21*, 501.

Henning, K., Leitenberg, H., Coffey, P., Turner, T., and Bennett, R. T. (1996). Long-term psychological and social impact of witnessing physical conflict between parents. *Journal of Interpersonal Violence, 11*(1), 35-51.

Herrenkohl, R., Tajima, E., Sousa, C., Herrenkohl, T., and Moylan, C. (2008). Intersection of child abuse and children's exposure to domestic violence. *Trauma, Violence Abuse, 9*(2), 84.

Hetzel, M. D., and McCanne, T. R. (2005). The roles of peritraumatic dissociation, child physical abuse, and child sexual abuse in the development of posttraumatic stress disorder and adult victimization. *Child Abuse and Neglect, 29*(8), 915-930.

Higgins, D. J., and McCabe, M. P. (1994). The relationship of child sexual abuse and family violence to adult adjustment: Toward an integrated risk-sequelae model. *Journal of Sex Research, 31*(4), 255-266.

Higgins, D. J., and McCabe, M. P. (2000). Multi-type maltreatment and the long-term adjustment of adults. *Child Abuse Review, 9*(1), 6-18.

Higgins, D. J., and McCabe, M. P. (2000). Relationships between different types of maltreatment during childhood and adjustment in adulthood. *Child Maltreatment, 5*(3), 261-272.

Higgins, D. J., and McCabe, M. P. (2001). Multiple forms of child abuse and neglect: Adult retrospective reports. *Aggression and Violent Behavior, 6*(6), 547-578.

Holden, G. W. (2003). Children exposed to domestic violence and child abuse: Terminology and taxonomy. *Clinical Child and Family Psychology Review, 6*(3), 151-160.

Hughes, H. M., Parkinson, D., and Vargo, M. (1989). Witnessing spouse abuse and experiencing physical abuse: A 'double whammy'? *Journal of Family Violence, 4*(2), 197-209.

Johnson, H., & Thompson, A. (2008). The development and maintenance of post-traumatic stress disorder (PTSD) in civilian adult survivors of war trauma and torture: A review. *Clinical Psychology Review, 28*(1), 36-47.

Katz, C. L., Pellegrino, L., Pandya, A., Ng, A., & DeLisi, L. E. (2002). Research on psychiatric outcomes and interventions subsequent to disasters: A review of the literature. *Psychiatry Research, 110*(3), 201-217.

Kendler, K. S., Neale, M. C., Kessler, R. C., Heath, A. C., and Eaves, L. E. (1992). Childhood parental loss and adult psychopathology in women. A twin study perspective. *Arch Gen Psychiatry, 49*, 109-16.

Kessler, R. C., Davis, C. G., and Kendler, K. S. (1997). Childhood adversity and adult psychiatric disorder in the US national comorbidity survey. *Psychological Medicine, 27*, 1101-1119.

Kilpatrick, D.G., Resnick, H.S., Freedy, J.R., Pelcovitz, D., Resick, P.A., Roth, S., & van der Kolk, B. (1998). In T.Widiger, A. Frances, H. Pincus, R. Ross, M. First, W. Davis, M. Kline (Eds.), The posttraumatic stress disorder field trial: Emphasis on Criterion A and overall PTSD diagnosis, pp. 303-344. DSM-IV Sourcebook Vol. 4, Washington, DC: American Psychiatric Press.

Kilpatrick, D. G., Ruggiero, K. J., Acierno, R., Saunders, B. E., Resnick, H. S., and Best, C. L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: Results from the national survey of adolescents. *Journal of Consulting and Clinical Psychology, 71*(4), 692-700.

Lehmann, P. (2000). Posttraumatic stress disorder (PTSD) and child witnesses to mother-assault: A summary and review. *Children and Youth Services Review, 22*(3-4), 275-306. Lenox, M., & Gannon, L. (1983). Psychological consequences of rape and variables influencing recovery: A review. *Women & Therapy, 2*(1), 37-49.

Lieberman, A. F. (2004). Traumatic stress and quality of attachment: Reality and internalization in disorders of infant mental health. *Infant Mental Health Journal, 25*(4), 336-351.

Leitenberg, H., Gibson, L. E., & Novy, P. L. (2004). Individual differences among undergraduate women in methods of coping with stressful events: The impact of cumulative childhood stressors and abuse. *Child Abuse & Neglect, 28*(2), 181-192.

Maker, A. H., Kemmelmeier, M., and Peterson, C. (1998). Long-term psychological consequences in women of witnessing parental physical conflict and experiencing abuse in childhood. *Journal of Interpersonal Violence, 13*(5), 574-589.

Malone, J., Tyree, A., and O'Leary, K. D. (1989). Generalization and containment: Different effects of past aggression for wives and husbands. *Journal of Marriage and the Family, 51*(3), 687-697.

McDonald, R., Jouriles, E. N., Ramisetty-Mikler, S., Caetano, R, and Green C. E. (2007). Estimating the number of American children living in partner-violent families. Journal of Family Psychology, 20 (1), 137-142.

McFarlane, J., Parker, B., Soeken, K., and Bullock L. Assessing for abuse during pregnancy: Severity and frequency of injuries and associated entry into prenatal care. *Journal of the American Medical Association.* 1992; 267:3176.

McGuigan,W. and Pratt, C . (2001). The predictive impact of domestic violence on three types of child maltreatment. *Child Abuse Neglect, 25*(7), 869.

Nishith, P., Mechanic, M. B. &. Resick, P. A. (2000). Prior interpersonal trauma: The contribution to current PTSD symptoms in female rape victims. Journal of Abnormal Psychology, 109 (1), 20-25.

Peled, E., and Davis, D. (1995). *Groupwork with children of battered women: A practitioner's manual.* Thousand Oaks, CA, US: Sage Publications, Inc.

Resnick, H. S., Kilpatrick, D. G., Dansky, B. S., Saunders, B. E., and Best, C. L. (1993). Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *Journal of Consulting and Clinical Psychology, 61*(6), 984-991.

Roesler, T. A., and McKenzie, N. (1994). Effects of childhood trauma on psychological functioning in adults sexually abused as children. *The Journal of Nervous and Mental Disease, 182*(3), 145.

Roth, S., Newman, E., Pelcovitz, D., Van der Kolk, B., and Mandel, F. S. (1997). Complex PTSD in victims exposed to sexual and physical abuse: Results from the DSM-IV field trial for posttrau-matic stress disorder. *Journal of Traumatic Stress, 10*, 539-555.

Shonk, S. M., and Cicchetti, D. (2001). Maltreatment, competency deficits, and risk for academic and behavioral maladjustment. *Developmental Psychology, 37*(1), 3-17.

Silvern, L., Karyl, J., Waelde, L., Hodges, W. F., Starek, J., and Heidt, E. (1995). Retrospective reports of parental partner abuse: Relationships to depression, trauma symptoms and self-esteem among college students. *Journal of Family Violence, 10*, 177.

Spitzer, R. L., Williams, J. B., Gibbon, M., and First, M. B. (1992). The structured clinical interview for DSM-III--R (SCID): I. history, rationale, and description. *Archives of General Psychiatry, 49*(8), 624-629.

Stafford, B., Zeanah, C. H., and Scheeringa, M. (2003). Exploring psychopathology in early childhood: PTSD and attachment disorders in DC: 0-3 and DSM-IV. *Infant Mental Health Journal, 24*(4), 398-409.

Straus, M. A. (1992). Sociological research and social policy: The case of family violence. *Sociological Forum, 7*(2), 211-237.

Stimpson, N. J., Thomas, H. V., Weightman, A. L., Dunstan, F., & Lewis, G. (2003). Psychiatric disorder in veterans of the persian gulf war of 1991: Systematic review. *British Journal of Psychiatry, 182*(5), 391-403.

Stith, S. M., Rosen, K. H., Middleton, K. A., Busch, A. L., Lundeberg, K., & Carlton, R. P. (2000). The intergenerational transmission of spouse abuse: A meta-analysis. *Journal of Marriage & the Family, 62*(3), 640-654.

U.S. Department of Health and Human Services, Administration on Children, Youth and Families. (2005). Child maltreatment 2003. Washington, DC: U.S. Government Printing Office.

Wallace, B. (1990). Crack cocaine smokers as adult children of alcoholics: The dysfunctional family link. *Journal of Substance Abuse Treatment, 7*, 89-100.

Weber, D. A., & Reynolds, C. R. (2004). Clinical perspectives on neurobiological effects of psychological trauma. *Neuropsychology Review, 14*(2), 115-129.

Widom, C. S. (1999). Childhood victimization and the development of personality disorders: Commentary. *Archives of General Psychiatry, 56*(7), 607-608.

Wittchen, H. (1994). Reliability and validity studies of the WHO--composite international diagnostic interview (CIDI): A critical review. *Journal of Psychiatric Research, 28*(1), 57.

Wolfe, J., and Kimerling, R. (1997). Gender issues in the assessment of posttraumatic stress disorder. In J. P. Wilson, and T. M. Keane (Eds.), *Assessing psychological trauma and PTSD*. (pp. 192-238). New York, NY, US: Guilford Press.

World Health Organization, 1990. World Health Organization, Composite International Diagnostic Interview, World Health Organization, Geneva (1990).

Table 4-1.

Comparisons Between CV Groups on Demographic Variables (N = 1,258)

Variable	Overall Sample (N = 1258) M(SD) or N(%)	Witnesses (n = 263) M(SD) or N(%)	Abused (n = 100) M(SD) or N(%)	Combined (n = 171) M(SD) or N(%)	Comparison (n =724) M(SD) or N(%)	F (df_n, df_h) or $X^2(df)$
Demographics						
Disadvantage	1.84 (1.84)	2.5 (1.7)	1.7 (1.8)	2.5 (1.9)	1.5 (1.8)	33.4 (1255, 3)***
Age (years)	26 (5.89)	24.5 (5.8)	26.4 (6.1)	24.6 (5.8)	26.8 (5.8)	14.1 (1254, 3)***
Education (< h.s.)	593 (47.1%)	160 (60.8%)	45 (45%)	103 (60.2%)	285 (39.3%)	49.6 (3)***
Income (< $15,000)	284 (22.6%)	84 (31.9%)	19 (19%)	62 (36.3%)	119 (16.4%)	82.7 (12)***
Not Partnered	760(60.4%)	135 (51.3%)	36 (36%)	93 (54.4%)	235 (32.4%)	46.9(3)***
Ethnicity						
African American	566 (45%)	173 (65.8%)	40 (7.1%)	99 (57.9%)	254 (35%)	88.4(6)***
American Indian/ Alaska Native	19 (1.5%)	6(2.3%)	0 (0%)	10 (5.8%)	3(0.4%)	31.53(6)***
Asian	94 (7.5%)	8 (3%)	10 (10%)	11 (6.4%)	65 (9.0%)	12.5(6)
European American	568 (45.1%)	73 (27.8%)	49 (49%)	55 (32.2%)	391(53.9%)	69.2(6)***
Latina	54 (4.3%)	14 (5.3%)	3 (3.0%)	7 (4.1%)	30 (4.1%)	2.7(6)
Middle Eastern	29 (2.3%)	4(1.5%)	2 (2.0%)	6(3.5%)	17(2.3%)	3.4(6)

Native American/ Pacific Islander	7 (0.6%)	2 (0.8%)	0 (0%)	1 (0.6%)	4 (0.6%)	2.24(6)

Note. Socio-demographic disadvantage is a cumulative measure generated by summing the total number of the following items that were endorsed: teen pregnancy, African-American ethnicity, income less than $15, 000, high school education or less, and living in the center of Detroit. Each group represents all those reporting that racial or ethnic identity, and the X^2 tests for differences between that identity and all others.

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Table 4-2.
Comparisons Between CV Groups on Trauma Exposure and Psychiatric Distress (N = 1,258)

Variable	Overall Sample (N = 1258) M(SD) or N(%)	Witnesses (n = 263) M(SD) or N(%)	Abused (n = 100) M(SD) or N(%)	Combined (n = 171) M(SD) or N(%)	Comparison (n =724) M(SD) or N(%)	F *(df_n, df_b),* X^2*(df)* M(SD) or N(%)
Non-CV Trauma						
AAT	0.22 (0.55)	0.29 (0.62%)	0.31 (0.65%)	0.52 (0.81%)	0.10 (0.38%)	32.2 (1255, 3) ***
LNAT	3.5 (2.39)	4.22 (2.15%)	4.38 (2.37%)	5.32 (3.0%)	2.70(3.5%)	87.8 (1255, 3) ***
Psychiatric Caseness						
MDD	153 (12.2%)	33 (12.5%)	22 (22%)	35 (20.5%)	63 (8.7%)	28.3 (3) ***
GAD	56 (4.4%)	10 (3.8%)	9 (9%)	11 (6.4%)	26 (3.6%)	8.0 (3)*
Current PTSD	109 (8.7%)	20 (8.4%)	15 (16.1%)	47 (29.0%)	27(4.2%)	97.2 (3) ***
Lifetime PTSD	255 (20.3%)	56 (21.3%)	38 (38.0%)	82 (48.0%)	79 (10.9%)	140.2 (3) ***

Note. NAT=Non-abuse Trauma Exposure; AAT=Adult Abuse Trauma Exposure (sum of battering, sexual contact and penetration abuse types in adulthood); GAD=Generalized Anxiety Disorder; MDD=Major Depressive Disorder Each group represents all those reporting that racial or ethnic identity, and the X^2 tests for differences between that identity and all others.
*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Table 4-3.

Frequencies of Lifetime Non-Abuse Trauma Exposure by Groups (N = 1,259)

Type of Trauma	Comparison N(%)	Witnesses N (%)	Abused N (%)	Combined N (%)
Family Related				
Caregiver	113 (15.6%)	59 (22.4%)	35 (35%)	54 (31.6%)
Sudden death	243 (33.5%)	122 (46.4%)	39 (39%)	84 (49.1%)
Death	416 (57.4%)	166 (63.1%)	70 (70%)	105 (61.4%)
Family member jailed	140 (19.3%)	141 (53.6%)	30 (30%)	94 (55%)
Fostered/adopted	13 (1.8%)	14 (5.3%)	10 (10%)	30 (17.5%)
Parents separated/divorced	200 (27.6%)	125 (47.5%)	45 (45%)	84 (49.1%)
Separated/divorced	28 (3.9%)	11 (4.2%)	3 (3%)	16 (9.4%)
Event Related				
Serious Financial Problems	73 (10.1%)	70 (26.6%)	28 (28%)	87 (50.9%)
Illness	49 (6.8%)	22 (8.4%)	19 (19%)	22 (12.9%)
Painful medical procedure	20 (2.8%)	5(1.9%)	5 (5%)	6(3.5%)
Difficult EAB/SAB	77 (10.6%)	36 (13.7%)	19 (19%)	45 (26.3%)
Saw robbery/attack	81 (11.2%)	57 (21.7%)	18 (18%)	51 (29.8%)
Robbed/attacked	59 (8.1%)	42 (16%)	15 (15%)	34 (19.9%)
Sexually harassed	94 (13%)	48 (18.3%)	30 (30%)	49 (28.7%)
Disaster	38 (5.2%)	17 (6.5%)	14 (14%)	14 (8.2%)
War Zone	4 (0.6%)	4 (1.5%)	1 (1%)	2 (1.2%)
Saw Accident	165 (22.8%)	97 (36.9%)	35 (35%)	66 (38.6%)
Had accident	106 (14.6%)	56 (21.3%)	15 (15%)	41 (24%)
Jailed	35 (4.8%)	17 (6.5%)	7 (7%)	26 (15.2%)

Note. Difficult EAB/SAB= Difficult perinatal loss

Table 4-4.
Bivariate Relationships Between Main Predictors and PTSD outcomes (N = 1,258)

	Standardized Betas					Odds Ratios	
Predictor Variables	Lifetime PTSD Symptoms	Current PTSD Symptoms	Cluster B	Cluster C	Cluster D	Lifetime PTSD Diagnosis	Current PTSD Diagnosis
Comparison	-0.35***	-0.31***	-0.25***	-0.29***	-0.26***	0.25***	0.22***
Witnesses	0.05	0.05	0.04	0.03	0.07*	1.08	0.83
Abused	0.15***	0.10**	0.08**	0.10***	0.04	2.66***	1.95*
Combined	0.33***	0.32***	0.25***	0.31***	0.27***	4.87***	6.02***
LNAT	0.52***	0.46***	0.35***	0.41***	0.40***	1.54***	1.45***
AAT	0.30***	0.25***	0.18***	0.25***	0.19***	2.26***	2.20***
Disadvantage	0.20***	0.36***	0.30***	0.31***	0.38***	1.16***	1.60***

Note. The child victimization variables (Witnessed IPV, Experienced Child Abuse, and Combined Exposure) are a series of dummy variables to represent individuals with the described trauma exposure compared to all others, including the non-exposed comparison group.
*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Table 4-5.
Logistic Regression Analyses Predicting PTSD Symptom Counts (N = 1,259)

	Current PTSD			Lifetime PTSD		
Variable	β	R^2	ΔR^2	β	R^2	ΔR^2
Step 1		0.13	0.13***		0.04	0.04***
Disadvantage	0.36***			0.20***		
Step 2		0.23	0.10***		0.18	0.15***
Disadvantage	0.30***			0.13***		
WIPV	0.08*			0.13***		
ECA	0.15***			0.22***		
Combined	0.31***			0.36***		
Step 3		0.3	0.08***		0.32	0.14***
Disadvantage	0.24***			0.04		
WIPV	0.01			0.04		
ECA	0.09*			0.14***		
Combined	0.20***			0.22***		
LNAT	0.32***			0.42***		
Step 4		0.32	0.01***		0.35	0.02***
Disadvantage	0.25***			0.05*		
WIPV	-0.001			0.03		
ECA	0.09***			0.13*		
Combined	0.18***			0.19***		
LNAT	0.30***			0.39***		
AAT	0.11***			0.15***		

Note. The child victimization variables (Witnessed IPV, Experienced Child Abuse, and Combined Exposure) are a series of dummy variables to represent individuals with the described trauma exposure compared to all others, including the non-exposed comparison group.

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Table 4-6.

Logistic Regression Analyses Predicting Current PTSD Symptom Criteria (N = 1,259)

		Reexperiencing			Avoidance/Numbing			Hyperarousal		
Variable		β	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2
Step 1			0.09	0.09***		0.1	0.1***		0.15	0.15***
	Disadvantage	0.30			0.31***			0.38***		
Step 2			0.15	0.06***		0.19	0.09***		0.2	0.06***
	Disadvantage	0.25***			0.26***			0.34***		
	WIPV	0.06*			0.06*			0.06*		
	ECA	0.12***			0.15***			0.08*		
	Combined	0.24***			0.30***			0.24***		
						0.26	0.06***		0.26	0.06***
Step 3			0.19	0.05**						
	Disadvantage	0.21***			0.21***			0.29***		
	WIPV	0.01			-0.01			0.01		
	ECA	0.76*			0.10***			0.03		
	Combined	0.16***			0.20***			0.15***		
	LNAT	0.24***			0.28***			0.27***		
Step 4			0.2	0.01*		0.27	0.02***		0.27	0.00*
	Disadvantage	0.21**			0.21***			0.29***		
	WIPV	0.01			-0.01			-0.002		
	ECA	0.07*			0.09***			0.03		
	Combined	0.15***			0.18***			0.14***		
	LNAT	0.22***			0.26***			0.26***		
	AAT	0.08*			0.13***			0.07*		

Note. The child victimization variables (Witnessed IPV, Experienced Child Abuse, and Combined Exposure) are a series of dummy variables to represent individuals with the described trauma exposure compared to all others, including the non-exposed comparison group.

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Table 4-7.
Logistic Regression Analyses Predicting PTSD Caseness (N = 1,259)

Variables	Current PTSD			Lifetime PTSD		
	OR	Nagelkerke's R^2	Chi-square	OR	Nagelkerke's R^2	Chi-square
Step 1		0.124	68.0***		0.019	15.67***
Disadvantage	1.6***			1.61***		
Step 2		0.23	130.63***		0.156	131.47***
Disadvantage	1.55***			1.09*		
WIPV	1.45			2.03***		
ECA	4.43***			4.95***		
Combined	7.1***			6.96***		
Step 3		0.28	162.42***		0.28	246.09***
Disadvantage	1.49***			0.99		
WIPV	1.03			1.32		
ECA	2.94*			3.1***		
Combined	3.82***			3.58***		
LNAT	1.29***			1.45***		
Step 4		0.3	170.57***		0.29	256.21***
Disadvantage	1.51***			1.00		
WIPV	0.92			1.24		
ECA	2.73*			2.93***		
Combined	3.26***			3.21***		
LNAT	1.26***			1.42***		
AAT	1.58*			1.5*		

Note. The child victimization variables (Witnessed IPV, Experienced Child Abuse, and Combined Exposure) are a series of dummy variables to represent individuals with the described trauma exposure compared to all others, including the non-exposed comparison group.

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Table 4-8.

Logistic Regression Analyses for the Selection of Coping Strategies (N = 1,259)

Variable	OR										
	Alcohol	Tobacco	Drugs	Talk to friend	Cry	Sleep	Pray	Entertain	Work	Walk	Strenuous Exercise
Step 1											
Disadvantage	0.74***	1.04	1.10	0.58***	0.80***	1.01	1.33***	0.78***	0.87***	0.79***	0.59***
Step 2											
Disadvantage	0.69***	0.98	1.04	0.57***	0.76***	0.97	1.32***	0.76***	0.85***	0.79***	0.58***
WIPV	2.57***	1.92**	1.71*	1.58	2.11***	1.82***	1.31	1.27	1.48**	1.03	1.24
ECA	3.61***	3.70***	4.52***	1.57	2.10*	2.41***	1.30	1.20	1.87**	1.01	1.63
Combined	2.29**	3.12***	3.81***	0.98	2.19**	2.00***	0.89	1.77**	1.15	0.90	1.11
Step 3											
Disadvantage	0.65***	0.93	0.98	0.57***	0.72***	0.96	1.31***	0.76***	0.83***	0.79***	0.57***
WIPV	2.11***	1.48	1.30	1.53	1.68**	1.68**	1.25	1.24	1.34	1.05	1.18
ECA	2.80***	2.69***	3.23***	1.49	1.55	2.18**	1.22	1.17	1.65*	1.03	1.53
Combined	1.54	1.88**	2.23**	0.91	1.43	1.74**	0.81	1.69*	0.96	0.93	1.02
LNAT	1.19***	1.24***	1.24***	1.03	1.22***	1.07*	1.04	1.02	1.08**	0.99	1.04
Step 4											
Disadvantage	0.65***	0.93	0.99	0.57***	0.72***	0.95	1.31***	0.76***	0.83***	0.79***	0.57***
WIPV	2.00**	1.41	1.26	1.60	1.70*	1.70**	1.20	1.24	1.36*	1.04	1.20
ECA	2.69***	2.57***	3.15***	1.57	1.57	2.21**	1.17	1.16	1.67*	1.02	1.55
Combined	1.34	1.68**	2.09**	0.99	1.47	1.79**	0.73	1.68**	0.99	0.91	1.07
LNAT	1.17***	1.22***	1.23***	1.04	1.23***	1.07*	1.03	1.02	1.09**	0.99	1.05
AAT	1.49**	1.43**	1.23	0.77	0.93	0.92	1.39*	1.02	0.90	1.07	0.86

Note. The child victimization variables (Witnessed IPV, Experienced Child Abuse, and Combined Exposure) are a series of dummy variables to represent individuals with the described trauma exposure compared to all others, including the non-exposed comparison group.

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Table 4-9.

Logistic Regression Analyses for Selection of Mental Health Treatment Strategies (N = 1,259)

	OR								
Variable	Individual Therapy	Group Therapy	Family therapy	Support Grp	Self Help	Prescript Meds	Herbal	Preg Therapy	Preg Meds
Step 1									
Disadvantage	0.72***	1.10	0.79***	0.86*	0.64***	0.65***	0.56***	0.60***	0.47***
Step 2									
Disadvantage	0.68***	1.04	0.75***	0.82**	0.59***	0.62***	0.56***	0.56***	0.48***
Witnesses	1.35	1.55	1.58	1.27	1.51	1.30	0.62	1.69	0.61
Abused	4.35***	1.94	3.51***	1.96	2.92***	2.03*	0.70	2.30	0.97
Combined	2.82***	3.90***	3.06***	3.32***	3.91***	2.54***	2.33*	3.79***	1.79
Step 3									
Disadvantage	0.61***	0.98	0.72***	0.73***	0.55***	0.53***	0.50***	0.51***	0.43***
Witnesses	0.97	1.21	1.33	0.85	1.28	0.90	0.48	1.37	0.49
Abused	3.08***	1.39	2.83***	1.18	2.37**	1.29	0.51	1.75	0.71
Combined	1.59*	2.41**	2.21**	1.52	2.89***	1.29	1.53	2.64*	1.23
LNAT	1.31***	1.21***	1.15***	1.35***	1.15***	1.35***	1.22**	1.19**	1.21*
Step 4									
Disadvantage	0.61***	0.99	0.72***	0.73***	0.55***	0.53***	0.50***	0.51***	0.43***
Witnesses	0.92	1.17	1.25	0.81	1.23	0.84	0.44	1.31	0.49
Abused	2.93***	1.36	2.71***	1.15	2.32**	1.25	0.48	1.71	0.71
Combined	1.42	2.26**	1.94**	1.36	2.67***	1.13	1.23	2.31*	1.26
LNAT	1.29***	1.20***	1.13**	1.33***	1.14***	1.33***	1.18**	1.17*	1.21*
AAT	1.42**	1.21	1.48**	1.39	1.27	1.48**	1.83**	1.49*	0.88

Note. The child victimization variables (Witnessed IPV, Experienced Child Abuse, and Combined Exposure) are a series of dummy variables to represent individuals with the described trauma exposure compared to all others, including the non-exposed comparison group.

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Chapter 5

Conclusion

Research has established that childhood violence exposure plays a considerable role in the development of deleterious outcomes in childhood and adulthood. However, important gaps remain in understanding the complex relationships among early violence exposure, adulthood trauma exposure, emotion regulation, and PTSD. The first study attempted to differentiate the relationships that childhood victimization and adulthood trauma exposure have with emotion deficits, emotion regulation difficulties, and PTSD severity among retired police officers. Retired police officers afforded the opportunity to examine the relationship between childhood victimization and adult trauma exposure in the development of adulthood emotion-related difficulties and PTSD. Based on a sub-sample from the above-mentioned study on retired police officers who participated in a series of laboratory stress tasks, the second study investigated whether childhood victimization, adulthood trauma exposure, and current PTSD was related to a physiological indicator of emotion regulation (RSA). The final study investigated whether two specific types of childhood violence exposure (witnessing domestic violence and experiencing child abuse) are uniquely associated with PTSD while controlling for non-abuse trauma exposure.

Overall, these studies had some interesting findings. First, CV was related to ER processes and PTSD, but often other demographic or trauma variables were more

influential. Second, non-abuse adult trauma appeared to be a strong correlate of PTSD across the studies, which was contrary to the studies' initial hypotheses. Finally, the role of ER in mediating the relationship between CV and other outcomes (e.g., negative affect) was mixed.

Clinical Implications

These finding may provide further guidance to clinicians working with individuals with PTSD. These studies support the utility of assessing and potentially attending to childhood violence histories when assessing and treating current PTSD symptoms in adults. Specifically, these findings suggest that there is value in examining trauma exposure across the lifespan and across types (e.g., war, disasters, and accidents) rather than assuming a specific type of trauma exposure will be most salient to understanding their clinical presentation. Further these findings suggest that clinicians should attend to the contributions that non-abuse trauma and multiple lifetime exposures make to the development and persistence of PTSD among childhood victims of violence.

Limitations and Strengths

There are a few notable limitations and strengths of these studies. These studies also solely rely on cross-sectional, self-report, and retrospective data, and these findings are not generalizable to other populations population (i.e., age, gender, life circumstances). The measures of violence exposure did not specify the exact nature or severity of the violence exposure, which should also be further assessed in future research. However, the strength of these studies are their ability to model important covariates: adulthood victimization, adulthood non-abuse trauma, and childhood non-abuse trauma. These studies utilized well-validated measures, as well as able to utilize multiple measures of emotion regulation (self-

report and psychophysiological). Studies 1 and 2 are the first studies to date to examine the relationships among emotion regulation, PTSD, and trauma across the lifespan; study 3 is unique in its attempt to compare relationships of different childhood violence exposures while accounting for various adult trauma exposures in a community-based sample.

Future Directions

These studies can be used as a spring board for further investigations of the relationships between emotion regulation, childhood trauma, and adulthood trauma among other adult populations. This line of research would benefit from extending these analyses to study diverse individuals with respect to age, gender, and ethnicity/culture. Additionally, studies that follow children exposed to various forms of trauma from childhood to adulthood longitunally and incorporating other measures of emotion regulation, such as neuroimagining and neuroendocrine measures, may further inform the field. Future research could also identify and account for protective factors that may buffer emotion-related problems in PTSD. Qualitative studies are needed to explore characteristics of trauma exposure that increase risk/buffer individuals. Finally, further clinical research is needed to better understand how to best address emotion-related difficulties among individuals with PTSD and influence improve treatment outcomes.