

THE IMPACT OF TRAUMA ON ADOLESCENT MOTHERS'
PSYCHOLOGICAL FUNCTIONING, EMOTIONAL AVAILABILITY, AND
PROGRAM UTILIZATION

A dissertation

submitted by

Claudia Miranda-Julian, MS

in partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

in

Child Development

TUFTS UNIVERSITY

May 2013

Dissertation Committee members:

M. Ann Easterbrooks, Ph.D. (Chair)

Francine H. Jacobs, Ed.D.

Xiaodong Liu, Ed.D.

Ellen R. DeVoe, Ph.D.

Abstract

Given our limited understanding of the impact of trauma on the psychological and parental functioning among adolescent mothers, the current study aimed to address this gap by: 1) exploring the prevalence of trauma exposure among a sample of adolescent mothers participating in an evaluation of home visiting services; 2) investigating the rates of PTSD symptomatology among this population; 3) testing the fit of four alternate and empirically validated models of posttraumatic stress symptomatology; 4) testing relations between the symptom factors of posttraumatic stress symptomatology and parental emotional availability; and 5) exploring the relations between posttraumatic stress symptomatology and a number of program utilization indicators. Due to the high rates of comorbid depression and PTSD among traumatized populations, mediation analyses between depression, posttraumatic stress symptoms, and each of the outcome constructs (parental emotional availability and program utilization) were also explored. A number of significant findings emerged. For example, 1) participants reported extensive histories of trauma exposure; 2) approximately 50% of participants met full or partial PTSD criteria; 3) alternate factor models of posttraumatic stress symptomatology provided a better fit to the data than the existing DSM-IV three-factor model; 4) a number of posttraumatic stress symptom factors predicted parental non-hostility and 5) posttraumatic stress symptom factors were related to some indicators of program utilization. The findings highlight the importance of assessing for trauma exposure and PTSD among adolescent mothers participating in home visiting services. Assessments

will allow home visiting programs to provide necessary referrals to mental health providers that can adequately address the psychological and emotional needs of these young traumatized mothers.

Acknowledgments

We are social creatures to the inmost centre of our being. The notion that one can begin anything at all from scratch, free from the past, or unindebted to others could not conceivably be more wrong. - Karl R. Popper

I could not have accomplished this goal without the support and guidance of many. I would first like to thank my dissertation chair and primary advisor, Dr. Ann Easterbrooks. She has supported me through many external and internal struggles and, over the years, has been the kind of mentor that I can only hope to emulate as I continue along my professional path. Dr. Easterbrooks has, without a doubt, provided me with the "emotional availability" I very much needed throughout my doctoral career. Her patience and flexibility are unmatched.

I would also like to thank my secondary advisor, Dr. Fran Jacobs. She has not only supported me throughout this journey but has also provided me with an array of opportunities that have served to broaden my interests and I am thankful for this. My gratitude also goes out to Dr. Xiaodong Liu for his support in all analytical matters. Thank you very much Dr. Liu for your willingness to serve on my committee and for all of your valued feedback on this dissertation.

I would like to thank my outside reader, Dr. Ellen R. DeVoe for her willingness to serve on my committee and for sharing her expertise on trauma. I would also like to take this opportunity to thank her for pushing me to pursue a doctoral degree. Many years ago I met Dr. DeVoe and my life has never been the same. Because of her mentorship and unending belief in me I am completing this

degree. Thank you to all of my committee members. It is with great honor and privilege that I call you all my mentors.

I would like to thank all of my colleagues at the Massachusetts Healthy Families Evaluation for all of their support and encouragement throughout the years. A special thanks to Jess Goldberg, Margaret Brady, Jana Chaudhuri, Melissa Moran, and Chie Kotake - your assistance in all matters made this possible.

Thank you to my colleagues for keeping me grounded and always reminding me how worthwhile this work can be. I would especially like to thank Mariah Contreras, Maryna Raskin, Jess Goldberg, Jana Chaudhuri, Meg Brady and Jess Greenstone for their words of wisdom during the final hours!

An immense gratitude to my friends. Elizabeth Pufall Jones, thank you for your support and humor, you have certainly been a good friend over the years. Cynthia Davis, words cannot express how grateful I am to have you in my life - you are a dear friend. Danielle Steinberger, you have been my dearest friend since we were adolescents and I cannot imagine a world without you. Thank you so much for your unconditional love and support. I am so honored to have gone through this journey with all of you by my side.

Finally, I would like to thank my husband, Daniel H. Julian. I never could have imagined a more supportive, encouraging, challenging, and loving husband. The gratitude I feel for him is immeasurable, and I hope one day I could give to him all that he has given to me.

I dedicate this dissertation to all the mothers who shared a moment of their lives with me and all the other interviewers on the project. Without their willingness to share their most difficult memories this work would not have been possible. I have nothing to give to them but my gratitude - thank you all!

I would also like to dedicate this dissertation to my family for their perseverance in the face of trauma: to my father, Edgar Rene Miranda; my grandmother Maria Antonieta Saravia; my brother, Rene Alejandro Miranda; and my sister, Diana Vanessa Miranda. You will always be my grounding force and a reminder of how much we have overcome as a family.

Table of Contents

Abstract	ii
Acknowledgments.....	iv
List of Tables	ix
List of Figures	xi
Chapter 1: Introduction	1
Chapter 2: Literature Review	8
Parenting and Psychological Outcomes among Adolescent Mothers.....	9
Prevalence of Trauma Exposure among Adolescent Mothers	16
Impact of Trauma on Psychological Functioning among Adolescent Mothers	23
Impact of Trauma on Parenting among Adolescent Mothers	31
Overview of PTSD and Parental Functioning among Adult Mothers	38
Prevalence and Consequence of Trauma among Adolescents.....	44
Theoretical Framework for Understanding the Impact of Trauma among Adolescents	46
Engaging Traumatized Individuals in Treatment	60
Engaging Mothers with Mental Illness in Home Visiting Services.....	65
Summary of Literature Review	71
The Present Study	75
Chapter 3: Method	81
Healthy Families Massachusetts	81

MHFE-2: A Randomized Controlled Trial	82
Present Sample.....	85
Measures	86
Analytic Plan.....	94
Chapter 4: Results	96
Exclusions and Missing Data.....	96
Descriptive Analyses	96
Bivariate Analyses	99
Confirmatory Factor Analyses	105
Multivariate Analyses	114
Summary of Findings.....	118
Chapter 5: Discussion	121
Tables	156
References	180

List of Tables

Table 1. Summary of Diagnostic Criteria for Posttraumatic Stress Disorder (PTSD)	156
Table 2. Hypothesized Factor Structures for Posttraumatic Stress Disorder (PTSD) Symptom Items	157
Table 3. Demographic Characteristics of Participants by Program Participation	158
Table 4. Group Differences for Parenting Outcome Variables by Program Participation and Program Utilization Distribution	160
Table 5. Distribution of Number of Traumatic Events Among Participants	161
Table 6. Distribution of Types of Traumatic Events Among Participants	162
Table 7. Distribution of Participants Who Met Full, and Partial Symptom Criteria (DSM-IV) for PTSD	163
Table 8. Demographic Characteristics of Participants by PTSD Status	164
Table 9. Group Differences for Parenting and Program Utilization Outcome Variables by PTSD status	166
Table 10. Intercorrelations for the 17 Symptoms of PTSD by Clusters	167
Table 11. Intercorrelations for Traumatic Events, Depression, Parenting Outcomes, and Program Utilization Outcomes	168
Table 12. Intercorrelations for Traumatic Events, Outcome Variables and PTSD Symptoms	169
Table 13. Means, Standard Deviations, and Ranges for the 17 Symptom Items of the PTSD-RI	170
Table 14. Goodness-of-Fit Indices of Five Models of Posttraumatic Stress Symptoms	172
Table 15. Correlations Between Latent Constructs for the Five Factor Dysphoric Arousal Posttraumatic Stress Model	173
Table 16. Means, Standard Deviations, and Range for Dysphoric Arousal Model Factors by Program Participation	174
Table 17. Nested Taxonomy of Regression Models that Describe the Relation Among Program Participation, Mental Health Functioning and Use, Posttraumatic Stress Factors, and Parental Sensitivity (Emotional Availability Free Play Task)	175
Table 18. Nested Taxonomy of Regression Models that Describe the Relation Among Program Participation, Mental Health Functioning and Use, Posttraumatic	176

Stress Factors, and Parental Sensitivity (Emotional Availability Teaching Task)

Table 19. Nested Taxonomy of Regression Models that Describe the Relation Among Program Participation, Mental Health Functioning and Use, Posttraumatic Stress Factors, and Parental Non-hostility (Emotional Availability Free Play Task)	177
--	-----

Table 20. Nested Taxonomy of Regression Models that Describe the Relation Among Program Participation, Mental Health Functioning and Use, Posttraumatic Stress Factors, and Parental Non-hostility (Emotional Availability Teaching Task)	178
---	-----

Table 21. Correlations between Latent Constructs for the Five Factor Dysphoric Arousal Posttraumatic Stress Model and Program Utilization Variables	179
---	-----

List of Figures

Figure 1. Conceptual Diagram of the Three Factor DSM-IV Model	107
Figure 2. Conceptual Diagram of the Four Factor Numbing Model	108
Figure 3. Conceptual Diagram of the Four Factor Dysphoria Model	109
Figure 4. Conceptual Diagram of the Five Factor Dysphoric Arousal Model	110
Figure 5. Completely Standardized Solution for the Five Factor Dysphoric Arousal Model of Posttraumatic Stress Symptoms	113

Chapter 1: Introduction

There is a gap in our understanding of how traumatic experiences may affect the psychological and parental functioning of adolescent mothers. Furthermore, little is known about the prevalence and impact of Posttraumatic Stress Disorder (PTSD) among these mothers. The literature does indicate that adolescent mothers are at a higher risk for developing depression. Moreover, individuals suffering from PTSD have higher rates of comorbid mental health diagnoses, such as depression. Given the high risk of depression among adolescent mothers and the link between depression and PTSD among traumatized individuals, further exploration of the relation between depression and PTSD is warranted among adolescent mothers.

High rates of comorbidity between PTSD and other mental health diagnoses, such as depression, have also led a number of researchers to question the existing diagnostic criteria of PTSD, as listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2001). A number of studies have found that alternate factor structures of posttraumatic stress symptomatology¹ may actually provide a better fit to the data.

Finally, little is known about the links between trauma, PTSD, parenting behaviors, and program utilization among adolescent mothers enrolled in home visiting programs. For example, the literature does note that links exist between trauma exposure and adverse parenting outcomes but almost nothing is known

¹ In order to differentiate between the three factor model of Posttraumatic Stress Disorder (PTSD) detailed in the DSM-IV and alternate factor models proposed in the literature, *PTSD* will be used to refer to the DSM-IV model and the criteria used for an official diagnosis of the disorder. *Posttraumatic stress symptomatology* will be used to refer to symptom factors proposed in alternate factor models of PTSD.

about the effects of PTSD on parenting among this population. Furthermore, we do not know how traumatized adolescent mothers with PTSD engage in intervention programs aimed at reducing maladaptive parenting. The goals of this dissertation are to address these gaps and elucidate the importance of trauma assessment when engaging adolescent mothers in care.

High-risk sexual behaviors, pregnancy, and abortion have been identified as risk outcomes following the experience of trauma (Berenson, Wiemann, & McCombs, 2001; Bleil et al., 2011). Furthermore, pregnancy, and for some adolescents, subsequent parenting, have been found to be an indirect result of engaging in a number of high-risk behaviors (Berenson, Wiemann, & McCombs, 2001; Coley & Chase-Lansdale, 1998; Meade, Kershaw, Ickovics, 2008; Smith, Level, & Chamberlain, 2006). Finally, traumatic experiences, such as child maltreatment, family violence, and separation from loved ones due to foster care placement, have been identified as factors preceding the risk of adolescent pregnancy (Adams & East, 1999; Boyer & Fine, 1992; Butler & Burton, 1990; De Paul & Domeniech, 2000; Oz & Fine, 1988; Putnam, 2006). It is evident that trauma and pregnancy/parenting are associated in the lives of many adolescents, however, little is known about the link between trauma exposure, PTSD, and parenting behaviors among adolescent mothers.

Although there is limited knowledge about the prevalence of PTSD among adolescent mothers, we do know that these mothers suffer disproportionately from depression when compared to adult mothers (Beers & Hollo, 2009; Gavin, Lindhorst, & Lohr, 2011; Horowitz, Bruce, Hoff, Harley, & Jekel, 1996; Osofsky,

Hann, & Peebles, 1993). We also know that adolescent mothers are more likely to engage in more adverse parenting (i.e., poor monitoring, child abuse) behaviors than adult mothers (Beers & Hollo, 2009; Borokowski, Bisconti, Willard, & Keogh, 2002; Coley & Chase-Lansdale, 1998; Furstenberg, 2007; Klein, 2005). A number of studies have found that depression is in fact an important indicator in understanding why young mothers are more susceptible to engaging in adverse parenting (Almgren, Yamashiro, & Ferguson, 2002; Dahinten, Shapka, & Willms, 2007; Leadbeater, Bishop, & Raver, 1996; Sommer et al., 2000; Spieker et al., 1999). Similar to depression, understanding the behaviors and cognitive processes associated with PTSD may help us to better explain adverse parenting behaviors among traumatized adolescent mothers. However, there currently exists a gap in our understanding of ways in which adolescent mothers with PTSD function as parents.

Co-occurring mental health disorders, or *comorbidity* is more likely among adolescents diagnosed with PTSD. In a number of studies, adolescents with PTSD reported more comorbid diagnoses such as depression, oppositional defiance, and substance abuse than adolescents without PTSD (Cauffman, Feldman, Waterman, & Steiner, 1998; Dixon, Howie, & Straling, 2005; Linning & Kearney, 2004; Lipschitz, Rasmusson, Anyan, Cromwell, & Southwick, 2000). Comorbidity may lead to differential effects among adolescents with histories of trauma exposure during childhood and adolescence as compared to individuals with a history of trauma exposure during adulthood. However, high rates of comorbidity, especially with depression, may actually point to the ineffectiveness

of the three factor model of PTSD presented in the DSM-IV-TR (APA, 2000). In fact, a number of studies have found that varying factor structure models of PTSD provide a better fit to data collected from a number of diverse populations when compared to the existing three factor structure (Asmundson, Stapleton, & Taylor, 2004; Elhai & Palmieri, 2011; Forbes, et al., 2011; Hall, Elhai, Grubaugh, Tuerk, & Magruder, 2012; King, Leskin, King, & Weathers, 1998; Miller, Wolf, Harrington, Brown, Kaloupek, & Keane, 2010; Saul, Grant, & Smith Carter, 2008; Simms, Watson, & Doebbeling, 2002). However only a limited number of studies have investigated the factor structure among adolescent populations (Armour et al., 2011; Ayer, Cisler, Danielson, Amstadter, Saunders, & Kilpatrick, 2011; Elhai, Ford, Ruggiero, & Frueh, 2009; Saul, Grant, & Smith Carter, 2008; Stewart, Steiman, Cauce, Cochran, Whitbeck, & Hoyt, 2004; Wang, Long, Li, Armour, 2011). No known studies have investigated the factor structure of PTSD among adolescent mothers.

Just as we know little about the link between PTSD and parenting among adolescent mothers, our understanding of how these mothers use prevention or intervention services is also very limited. In order to address the risk of perpetrating child abuse among adolescent mothers, a number of prevention programs have been instituted across the United States. Home visitation services such as those provided by Healthy Families America, are among the most known and utilized forms of prevention. These services exist throughout the United States and aim to provide supportive assistance to parents at-risk for child

maltreatment², including child abuse and neglect. In these programs parents are partnered with a home visitor (nurse, social worker, or paraprofessional) and face to face meetings are scheduled on a regular basis. Findings from home visiting programs are quite variable, with some programs indicating positive outcomes and others finding no differences among participants and non-participants (Astuto & Allen, 2009; Nievar, Van Egeren, & Pollard, 2010; Sweet & Applebaum, 2004). Variable findings can be due to the fact that there is vast heterogeneity of needs among enrolled participants. For example, a number of studies indicate that mental illness is an obstacle for many mothers who enroll in services (Ammerman, Shenk, Teeters, Noll, Putnam, & Van Ginkel, 2011; Damashek, Doughty, Ware, & Silovsky, 2011; Harden, 2010; Stevens, Ammerman, Putnam, Gannon, & Van Ginkel, 2005). Findings also indicate that paraprofessional home visitors seem ill-equipped to handle the needs and expectations of mothers suffering from mental illness (Ammerman, Shenk, Teeters, Noll, Putnam, & Van Ginkel, 2010; Harden, 2010; Hebbeler & Gerlach-Downie, 2002; Stevens, Ammerman, Putnam, Gannon, & Van Ginkel, 2005).

In sum, there is a wide gap in our understanding of how traumatic experiences influence the psychological and parental behaviors of adolescent mothers. The literature indicates that adolescents are adversely affected by trauma and that a significant number of high-risk adolescents, including mothers, have extensive histories of trauma. Although we know that trauma is present in the lives of adolescent mothers, we know little about their functioning after

² The term child maltreatment, child abuse, physical abuse, sexual abuse, and emotional abuse will be used interchangeably throughout the literature review. Terminology will be based on the particular language used by the authors of the findings that are being presented.

trauma - particularly the prevalence of PTSD. We also find that the current diagnostic criteria for PTSD may actually be inappropriate for this population. Moreover, we know very little about how symptoms of PTSD are related to parenting among adolescents. Finally, we find that mental illness and a history of trauma may adversely impact various areas of help-seeking.

In this dissertation I aimed to further our understanding of the impact of trauma on adolescent parenting in five ways. First, I explored the prevalence of trauma exposure among a sample of adolescent mothers participating in an evaluation of the Massachusetts Healthy Families program. Second, I investigated the rates of PTSD symptomatology among this population. Third, I used Confirmatory Factor Analysis (CFA) to fit four models of PTSD to a sample of adolescent mothers with a history of trauma. Fourth, using mean factor scores from the best-fitting model, I tested relations between the symptom factors of posttraumatic stress symptomatology and parenting, particularly maternal sensitivity and non-hostility in interactions with their children. I also explored the mediating relation between depression and posttraumatic stress symptomatology in predicting maternal sensitivity and hostility. Finally, I used the mean factor scores of the best-fitting model to explore the relations between posttraumatic stress symptomatology and a number of program usage indicators. In addition to addressing a number of gaps in the literature, this dissertation aimed to address practice implications. This dissertation concludes with a discussion of a number of practice implications for adolescent mothers engaged in home visiting services

- primarily, the need for proper training of home visitors in assessing trauma and posttraumatic symptomatology.

Chapter 2: Literature Review

There is a limited understanding of the factors that impact the psychological and parental functioning among traumatized adolescent mothers. Traumatic events, such as childhood histories of maltreatment and exposure to intimate partner violence (IPV), have been linked to maladaptive parenting among both adult and adolescent mothers (DiLillo & Damashek, 2003; Lang, Gartstein, Rodgers, & Lebeck, 2010; Noll, Trickett, Harris, & Putnam, 2008). Although childhood maltreatment and IPV pose risks to an adolescent mother's sense of safety, adolescent mothers are exposed to various other traumatic events over their lifetimes that are seldom assessed. Examples include victimization through community violence, witnessing community violence, and the traumatic loss of loved ones. An adolescent mother's cumulative experience of trauma can inhibit her potential to optimally parent.

According to the American Psychiatric Association (DSM-IV-TR, 2000) trauma is defined as an event "that involves actual or threatened death or serious injury, or other threat to one's physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about the unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate" (p. 463). A traumatic event can be experienced directly (i.e., military combat, physical abuse, sexual abuse, sexual assault, physical attack, torture, or terrorist attacks), or experienced indirectly by either witnessing an event (i.e., physical assault, dead

bodies, domestic violence, or terrorist attacks) or learning about an event (i.e., assault of a loved one, serious accident, or violent death of a loved one).

Although the literature indicates that adolescent mothers with trauma histories behave less optimally as parents than do mothers with no trauma history, we know little about the impact of Posttraumatic Stress Disorder (PTSD) on parenting among traumatized adolescent mothers. In this review of the literature, I investigated a number of areas that allow us to better disentangle the impact of traumatic events on the psychological and parental functioning of adolescent mothers.

Parenting and Psychological Outcomes among Adolescent Mothers

A brief review of the psychological and parenting outcomes among the general population of adolescent mothers allows us to understand how the experience of trauma may serve as a factor that links adolescent parenting with adverse outcomes. *Parenting* refers not only to behaviors, but also the beliefs, attitudes, and practices of adolescents within the context of being mothers. Parenting and psychological outcomes among adolescent mothers vary greatly (Borkowski, Whitman, & Farris, 2007; Easterbrooks, Chaudhuri, Bartlett, & Copeman, 2010; Hans & Thullen, 2009; Hess, Papas, & Black, 2002; Noriah, Weed, & Keogh, 2007; SmithBattle, 2009). As a whole, adolescent mothers and their children appear to function less optimally than does the general population of adult mothers and their children. In their review of the literature, Beers and Hallo (2009) suggested that suboptimal functioning among adolescent mothers and their children is difficult to disentangle from factors that are highly correlated

with maternal age (i.e., socioeconomic status, home, and environmental factors).

A number of home and environmental factors that are highly correlated with maternal age can also present a high risk for trauma exposure, such as living in inner-city communities and impoverished neighborhoods (Meade, Kershaw, & Ickovics, 2008).

In the following section I briefly reviewed findings that pertained to the psychological functioning and parenting among the general population of adolescent mothers. It is important to note that a number of these studies more likely included traumatized individuals, however differences among traumatized and non-traumatized participants were not always noted.

Increased psychological distress. Psychological distress is often studied as an outcome, moderator, and mediator among populations of adolescent mothers. Depression, anxiety, postpartum depression, parenting stress, suicidal ideation, and low self-worth are a few of the psychological factors often investigated (East, Matthews, & Felice, 1994; Gavin, Lindhorst, & Lohr, 2011; Hodgkinson, Colantuoni, Roberts, Berg-Cross, & Belcher, 2010; Luster & Brophy-Herb, 2000).

Similar to studies among populations of adult mothers, depression and postpartum depression are easily the most researched psychological factors among adolescent mothers. Unlike populations of adult mothers, adolescent mothers appear to be at greater risk of suffering from depression and/or postpartum depression (Birkeland, Thompson, & Phares, 2005; Schmidt, Wiemann, Rickert, & Smith, 2006). For example, using nationally representative

longitudinal data sets, Mollborn and Morningstar (2009) found that teenage mothers averaged a higher distress score on the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) than did adult mothers (.56 vs. .38). Studies have also found that depression among adolescent mothers may not subside over time (Noria, Weed, & Keogh, 2007; Schmidt, Wiemann, Rickert, & Smith, 2006). In their longitudinal investigation (17-year cohort study) of 173 adolescent mothers, Gavin, Lindhorst, and Lohr (2011) found that antenatal depression and intimate partner violence were associated with elevated depressive symptomatology over a number of years, indicating persistence of depression over time. In a prospective study of adolescents, Biello, Sipsma, and Kershaw (2010) found that changes in mental health over time did not differ among parenting and nulliparous adolescents. However, they did find that adolescent mothers' mental health improved at a slower rate compared to nulliparous females, indicating that although slow, improvement still exists.

Adolescent mothers suffering from higher rates of psychological distress (i.e., depression, parenting stress, and lower self-esteem) are at higher risk for engaging in negative parenting practices (i.e., decreased empathy or less supportive care) and perceive themselves as unable to properly care for their children. This indicates that the level of psychological functioning is an important determinant of parental functioning (Black, et al., 2002; East, Matthews, & Felice, 1994; Luster, 1998; Luster & Brophy-Herb, 2000). Depression among adolescent mothers has also been linked to adverse developmental outcomes for their children, such as increased internalizing and

externalizing behaviors (Almgren, Yamashiro, & Ferguson, 2002; Black et al., 2002; Sommer et al., 2000; Spieker, Larson, Lewis, Keller, & Gilchrist, 1999).

Depression coupled with suicidal ideation has also been linked to adverse physical health outcomes (i.e. low birth weight) among infants of adolescent mothers (Hodgkinson, Colantuoni, Roberts, Berg-Cross, & Belcher, 2010).

However, Easterbrooks, Chaudhuri, Bartlett, and Copeman (2010) found that high rates of psychological distress are not always predictors of maladaptive parenting.

Although high depressive symptomatology was not found to be related to child abuse risk among mothers with young children, Easterbrooks et al. (2010) did suggest that persistent maternal psychopathology may compromise maternal and child well-being over time.

Increased risk of engaging in negative parenting behaviors.

Emotional availability. Emotional availability is a key construct in the positive social and emotional development of a child. Emotional availability includes an individual's openness, responsiveness, and positive behavior towards another individual with whom ongoing interaction exists (Emde, 1980). It also includes a caregiver's capacity to perceive and interpret a child's emotions accurately and appropriately (Easterbrooks & Biringen, 2005). A mother's ability to be emotionally available sets the stage for organized socioemotional regulation in childhood (Easterbrooks, Chaudhuri & Gestsdottir, 2005).

In their review of the literature, LeTourneau, Stewart, and Barnfather (2004) found that adolescent mothers display more difficulties in functioning than non-parenting adolescents. For example, adolescent mothers "exhibit more

identity diffusion, coping difficulties, less autonomy, more difficulties with trust, and lower self-esteem" (p. 515) when compared to nulliparous adolescents.

LeTourneau, Stewart, and Barnfather (2004) also found that adolescent mothers are "more punitive in their discipline strategies, less nurturing, perceive their child's temperament as more difficult, and pose greater risk for abuse of their children" (p. 516) when compared to adult mothers. Overall, it appears that adolescent mothers are less emotionally available to their children than are adult mothers.

On average, adolescent mothers are less sensitive and responsive to their infants and are less likely to correctly interpret their infants' cues (Hans & Thullen, 2009). When compared to adult mothers, adolescent mothers were found to behave less sensitively, use significantly fewer positive comments in their interactions with their children, and their children were less likely to be classified as securely attached (Demers, Bernier, Tarabalusy, & Provost, 2010).

In an investigation of emotional availability among young mothers, Driscoll and Easterbrooks (2007) found that mothers categorized as "intrusive-prohibitive" were more likely to display unpredictable behavior changes (i.e., withdrawal from play with their child or abrupt changes in the focus of play) in their interactions with their toddlers. These mothers were also more likely to report their own childhood history of abuse, report more symptoms of depression, and report higher self-confidence in their parenting abilities than were mothers who displayed more optimal parental functioning. In a later study, young mothers categorized as "insensitive and directive" had children who displayed

significantly lower levels of responsiveness and involvement in interactions with their mothers (Chaudhuri, Easterbrooks, & Davis, 2009).

Child abuse risk. Child abuse has been one of the most researched adverse outcomes among adolescent mothers (Dukewich, Borkowski, & Whitman, 1996; Luster & Brophy-Herb, 2000; Schatz & Lounds, 2007). A number of studies have found that both the risk for abuse and the prevalence of abuse are higher among adolescent mothers when compared to adult mothers (Goerge & Lee, 1997; Goerge, Harden, & Lee, 2008; Lee & Goerge, 1999; Parrish, Young, Perham-Hester, & Gessner, 2011; Putnam-Hornstein & Needell, 2011; Wu et al., 2004). For example, in the Chicago Longitudinal Study of over 1,400 participants, adolescent motherhood was found to be a robust predictor of child maltreatment (Mersky, Berger, Reynolds, & Gromoske, 2009). The stressors faced by an adolescent mother, along with her lack of emotional and cognitive preparedness increase her risk of engaging in abusive behavior with her child (Luster & Brophy-Herb, 2000).

In the Notre Dame Adolescent Parenting Project (NDAPP), a longitudinal study following a cohort of adolescent mothers over their children's first eighteen years of life, Schatz and Lounds (2007) found that maternal depression and intelligence were strong predictors of child abuse potential (a measure of attitudes that place a mother at risk for becoming abusive). They also found that child abuse potential mediated the relation between maternal depression and children's depression and aggression during middle childhood, as well as the relation

between maternal intelligence and children's aggression during the same developmental period.

Maternal neglect can also increase the risk of adverse child outcomes (Levine, Pollack, & Comfort, 2001). Schatz and Lounds (2007) point out that "teen mothers may be less focused than adult mothers on teaching socialization skills to their children because they are forced to deal with high levels of stress and often do not possess mature socioemotional regulation skills themselves, perhaps because of their own histories of maltreatment" (p. 141). In fact, Schatz and Lounds found that maternal childhood histories of neglect were associated with neglectful behaviors (i.e., emotional, cognitive, and physical neglect as well as lack of supervision) after controlling for maternal intelligence and depression. They also found that neglect potential mediated the relation between insensitive and unresponsive maternal interactions and children's aggression in middle childhood.

Although adolescent mothers are at a higher risk for abusing their children than are adult mothers, these mothers are not always the perpetrators of abuse. The risk of abuse or exposure to violence at the hands of other perpetrators exists because adolescent mothers are victims of abuse themselves and may not be equipped or able to protect their children from this exposure (Fallon, Ma, Black, & Wekerle, 2011; Moore & Florsheim, 2008; Weaver & Akai, 2007). A number of studies also have found that maternal age is not a significant indicator of child abuse potential. Rather, these studies found that a better predictor is maternal

history of childhood maltreatment (i.e., abuse and/or neglect) (Ornduff, Kelsey, Bursi, Alpert, & Bada, 2002; Scannapieco & Connell-Carrick, 2004).

In conclusion, adverse experiences, including trauma, appear to be consistently confounded with maternal age. Adolescent mothers are more likely to have experienced adverse events and to live in settings where these experiences occur (i.e., inner city, impoverished neighborhoods). In turn, these adversities are often associated with negative psychological and parental functioning among adolescent mothers. It appears that traumatic experiences and the impact of these experiences may help us explain why some adolescent mothers engage in particular parenting behaviors.

Prevalence of Trauma Exposure among Adolescent Mothers

A number of studies investigating the parenting outcomes of adolescent mothers have found that traumatic experiences, more specifically exposure to child maltreatment and IPV, have been linked to greater parenting risks and adverse developmental outcomes among the children of these mothers (Carpenter & Sacks, 2009; Driscoll & Easterbrooks, 2007). In the following section I review the literature that investigates trauma exposure among adolescent mothers.

Types of trauma exposure among adolescent mothers. Rates of exposure to traumatic events among adolescent mothers vary greatly, as do the types of traumatic events to which these mothers are exposed. Literature points to the variable, and at times cumulative, trauma experiences among adolescent mothers for example, 1) physical abuse, 2) sexual abuse, 3) emotional abuse, 4) neglect, 5) witnessing interpersonal violence, including intimate partner violence,

6) directly experiencing interpersonal violence, including intimate partner violence, 7) sexual assault/rape, 8) physical injury, 9) verbal abuse, and 10) witnessing community violence.

The prevalence of trauma exposure among adolescent mothers is often presented in comparison to that of other groups, for example, nulliparous adolescents and/or parenting adults. In this section I first present the findings for studies that consisted only of adolescent mothers. I then present the findings comparing nulliparous adolescents to parenting/pregnant adolescents. I conclude by presenting the findings comparing adult parents to adolescent parents.

Adolescent mothers. A majority of studies investigating the prevalence of trauma among adolescent mothers focus on various forms of child maltreatment. Child maltreatment includes physical, sexual, and emotional abuse, as well as neglect of children under the age of 18 by a parent, guardian or another adult in charge of care (Centers for Disease Control and Prevention, 2010). Studies that investigated the prevalence of physical and/or sexual abuse among adolescent mothers found that 18% to 50% of mothers reported a history of physical and sexual abuse (Bailey, Moran, & Pedersen, 2007; Lesser & Koniak-Griffin, 2000). Researchers appear to inquire less about emotional abuse and neglect among adolescent mothers (Weinman, Smith, Geva, & Buzi, 1998).

Intimate partner violence (IPV) is also a type of trauma that is increasingly recognized as a problem among adolescent mothers and their partners (Barnet & DeVoe, 2008; Meyers & Battistoni, 2003; Mylant & Mann, 2008; Renker, 1999). Experiencing intimate partner violence during pregnancy ranges from 22% to

38% among adolescent mothers (Mylant & Mann, 2008; Renker, 1999). It is important to note, however that a number of studies reported the prevalence of physical assault and sexual assault/rape without specifically identifying the perpetrator (Lesser, Koniak-Griffin, Gonzales-Figueroa, Huang, & Cumberland, 2007; Martin, Clark, Lynch, Kupper, & Cilenti, 1999; Patchen, Caruso, & Lanzi, 2009; Sarri & Phillips, 2004). Not identifying the perpetrator makes it very difficult to determine whether the abuse is child maltreatment, intimate partner violence, or a random act of violence. Since most sexual violence occurs at the hand of a known individual (Centers for Disease Control and Prevention, 2008), we can assume that most adolescent mothers know their attacker and that a majority of the victims are either related to their attacker or romantically involved with him/her.

A number of studies reported on cumulative experiences of trauma. For example, two studies had participants report on their histories of child maltreatment and IPV (Barnet & DeVoe, 2008; Meyers & Battistoni, 2003). Other studies expanded their scope by asking about participants' direct and/or indirect experiences with community violence (Kennedy & Bennett, 2006; Martin, Clark, Lynch, Kupper, & Cilenti, 1999; Mitchell et al., 2009; Sarri & Phillips, 2004; Weiman, Agurcia, Berenson, Volk, & Rickert, 2000). In recognizing the detrimental impact of witnessing violence, researchers have also inquired about participants' exposure to witnessing IPV or domestic violence (Kennedy & Bennett, 2006; Kennedy, 2007).

Researchers who have assessed for more than one type of trauma found that a number of adolescent mothers experience multiple crises over a lifetime. For example, Kennedy and Bennett (2006) found that 75% of adolescent mothers were exposed to at least three types of violence. Sarri and Phillips (2004) found an even greater rate of trauma exposure, with 69% of adolescents experiencing 13 or more stressful events over a lifetime. Both Kennedy and Bennett (2006), and Sarri and Phillips (2004), inquired about multiple types of primary (directly experienced) and secondary (witnessed) exposure to violence. Although both their samples were small, their findings point out that adolescent mothers are exposed to multiple types of trauma over their brief lifetimes. Furthermore, the findings suggest that a number of adolescent mothers have substantial histories of secondary trauma exposure (Mitchell et al., 2009), therefore inquiries of only primary exposure may be insufficient to fully capture these mothers' trauma experiences.

Pregnant/parenting adolescents vs. nulliparous adolescents. Studies that include both pregnant/parenting adolescents and nulliparous adolescents have found trauma exposure rates that range from 12% to 94% (Adams & East, 1999; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Lansford et al., 2007; Milan, Ickovics, Kershaw, Lewis, Meade, & Ethier, 2004). Differences among these two groups seem to vary, with some studies finding significant differences between the trauma exposure rates of pregnant/parenting adolescents and nulliparous adolescents and other studies finding no significant differences between the groups.

Prospective studies of youth found a number of differences between traumatized and non-traumatized adolescents (Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Lansford et al., 2007). Lansford et al. (2007) found that abused youth were more likely to report being a parent, being pregnant, or impregnating someone, when compared to non-abused youth. They also found a gender difference in the likelihood of pregnancy among physically abused youth, where females were more likely to report being pregnant than males were to impregnating someone.

In a prospective study of traumatized and non-traumatized youth, Herrenkohl, Herrenkohl, Egolf, and Russo (1998) found that almost all parenting adolescents reported a history of maltreatment (94%), such that the odds of being maltreated were five times more likely than not being maltreated among adolescent parents. They also found that adolescent parenting (24% of the sample) was significantly related to childhood sexual abuse.

Adolescent parents vs. adult parents. Trauma exposure rates range from 20% to 82% among participants in studies that have compared adolescent parents to adult parents (Ammerman et al., 2009; Bert, Guner, & Lanzi, 2009; Browne & Bassuk, 1997; Leaman & Gee, 2008; Rickert, Wiemann, Harrykissoo, Berenson, & Kolb, 2002; Stevens, Ammerman, Putnam, & Van Ginkel, 2002). Studies that include adult parents also inquire about a greater number of traumatic events (i.e., interpersonal violence, sexual assault, witnessing violence, and verbal abuse) than do studies that compared parenting adolescents to nulliparous adolescents. A number of studies did not report differences in exposure rates between adolescent

and adult parents (Ammerman et al., 2009; Leman & Gee, 2008; Stevens, Ammerman, Putnam, & Van Ginkel, 2002). Of those studies where significant differences were found, adolescent mothers were more likely to report a history of trauma or experiencing more traumatic events than adult mothers.

In a sample of 682 mothers (adolescent; low-resource adult; and high-resource adult), adolescent mothers reported a greater number of childhood events of emotional abuse and physical abuse than did mothers in the high-resource adult group (Bert, Gunre, & Lanzi, 2009). Browne and Bassuk (1997) found that among 436 homeless or poorly housed mothers, adolescent mothers were more likely to report experiencing severe physical violence by a caretaker, but less likely to report IPV. Leaman and Gee (2008) also found no significant differences in reports of IPV among adolescent and young adult mothers. However, in a sample of over 700 adult and adolescent mothers, researchers found that current physical and verbal abuse rates were higher among adolescent mothers and their partners than with adult mothers (Rickert, Wiemann, Harrykissoo, Berenson, Kolb, 2002). Findings indicate that generally, adolescent mothers experience trauma at the same rate or at times, a higher rate than their adult counterparts.

Summary of trauma exposure prevalence. Studies consisting only of adolescent mothers found that rates of exposure to various types of traumatic events vary from as little as 9% to as much as 98%. This extreme range can be attributed to multiple factors, such as the number and types of trauma being measured and the demographics of the sample population (i.e., inner-city,

minority, homeless). Although as little as 9% of participants in one study reported experiencing trauma, a significant number of studies report that well over half of their participants experienced trauma over a lifetime, indicating that trauma is common among adolescent mothers.

When comparing parenting adolescents to nulliparous adolescents, findings indicate that trauma exposure is higher among adolescent mothers. In fact, studies found that adolescent parents were more likely to report histories of child abuse (Adams & East, 1999; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Lansford et al., 2007). Prospective studies that followed participants from childhood into adolescence found that youth who became pregnant or were parenting were more likely to report a history of trauma than were nulliparous youth (Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Lansford et al., 2007). These findings indicate that the experience of childhood trauma may put some adolescents at risk for prematurely engaging in behaviors that can increase the likelihood of becoming pregnant or impregnating someone.

Studies that compared adult and adolescent mothers expanded their definition of trauma to include events outside the realm of child maltreatment. These studies queried about witnessing violence, sexual assault, and domestic violence/intimate partner violence. The findings indicate that exposure rates among adolescent mothers are variable; with some studies indicating no differences (Ammerman et al., 2009; Leman & Gee, 2008; Stevens, Ammerman, Putnam, & Van Ginkel, 2002) and others indicate that adolescent mothers report more trauma exposure than do adult mothers (Bert, Guner, & Lanzi, 2009;

Browne & Bassuk, 1997; Rickert, Wiemann, Harrykissoo, Berenson, & Kolb, 2002). Findings support the idea that adolescent mothers have extensive histories of trauma. Furthermore, adolescent mothers are also exposed to a vast array of recent and ongoing trauma, as indicated by reports of current IPV and a number of other harmful events. A history of trauma and ongoing exposure to traumatic events may certainly impact an individual's ability to function on a daily basis.

Impact of Trauma on Psychological Functioning among Adolescent Mothers

The following section details the findings regarding psychological functioning among adolescent mothers with histories of trauma. The following areas are reviewed: 1) Posttraumatic stress disorder (PTSD); 2) depression and other internalizing factors; 3) suicidality and other high-risk behaviors; 4) aggression and other externalizing factors; and 5) relational factors.

Posttraumatic stress disorder. There is limited information on the link between lifetime exposure of traumatic events and PTSD among adolescent mothers. PTSD (see Table 1 for detailed diagnostic criteria) is an anxiety disorder characterized by intrusive thoughts, avoidance of reminders of the traumatic events, numbing of emotional responsiveness, and persistent physiological arousal following exposure to a traumatic stressor, and associated with impairment in social or occupational functioning (APA, 2000).

Three studies investigated posttraumatic stress symptoms. One study concerned PTSD and depression among a group of adult and adolescent mothers (Ammerman, Putnam, Chard, Stevens, & Van Ginkel, 2011). The two remaining studies investigated posttraumatic stress symptoms in mothers who were

adolescents at the time of the study or who had given birth during adolescence (Bailey, Moran, & Pederson, 2007; Mylant & Moran, 2008).

In a sample of 90 traumatized and depressed mothers (adolescent and adult), Ammerman et al. (2011) found that mothers with PTSD were more likely to report a history of childhood sexual abuse and greater depressive symptomatology. Symptoms of avoidance (a criterion of PTSD) were significantly associated with more severe psychopathology among mothers. The authors did not find any significant age differences between the group of mothers with PTSD and those without.

Mylant and Mann (2008) investigated a number of posttraumatic stress symptoms and found that dissociation and avoidance symptom scores were higher for mothers who reported current sexual trauma and IPV during pregnancy. Mothers who reported current sexual abuse also reported higher symptom scores for intrusive experience and anxious arousal.

Finally, Bailey, Moran, and Pederson (2007) investigated specific symptoms commonly associated with PTSD: dissociation and intrusive thoughts. They found that the experience of childhood sexual abuse was significantly related to higher dissociation symptoms and more trauma-related intrusive thoughts. Childhood physical abuse was also related to more trauma-related intrusive thoughts.

Although PTSD is rarely investigated as a mechanism for understanding adverse parenting outcomes among adolescent mothers, limited findings do indicate that posttraumatic stress symptoms and dissociation are present among

traumatized mothers. Comorbid diagnoses of depression and PTSD are also present among these mothers. This comorbidity is supported by similar findings among other traumatized populations (Dixon, Howie, & Straling, 2005; Cauffman, Feldman, Waterman, & Steiner, 1998; Lipschitz, Rasmusson, Anyan, Cromwell, & Southwick, 2000).

Depression and other internalizing factors. Depression is one of the most investigated psychological outcomes among traumatized mothers (Adams & East, 1999; Ammerman et al., 2009; Barnet, Liu, & DeVoe, 2008; Leaman & Gee, 2008; Lesser & Koniak-Griffin, 2000; Lesser, Koniak-Griffin, Gonzalez-Figueroa, Huang, & Cumberland, 2007; Mitchell et al., 2009; Mylant & Moran, 2008; Sarri & Phillips, 2004; Stevens, Ammerman, Putnam, & Van Ginkel, 2002). Overall, studies found that traumatized participants, regardless of the type of event experienced, were more likely to report more depressive symptoms than were participants without a history of trauma.

In a study of first time mothers (adult and adolescent), two of the best predictors of increased depression were a history of interpersonal trauma and young maternal age (Ammerman et al., 2009). Young maternal age was found to be a risk factor for developing depression, as was a history of trauma. This indicates that adolescent mothers with a history of trauma may be at an increased risk for experiencing depression compared to either adult mothers with a history of trauma or adolescent mothers without a history of trauma.

Although a history of trauma is significantly associated with depression, some studies indicate that experiencing ongoing abuse is likely to further

exacerbate depressive symptoms (Barnet, Liu, & DeVoe, 2008; Lesser & Koniak-Griffin, 2000; Mylant & Moran, 2008). A limited social support system may also contribute to feelings of isolation that worsen the symptoms of depression (Stevens, Ammerman, Putnam, & Van Ginkel, 2002).

Trauma exposure among adolescent mothers has also been linked to other internalizing factors, such as low self-esteem, identity confusion, and emotional distress (Bailey, Moran, & Pederson, 2007; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Meyers & Battistoni, 2003; Milan et al., 2004). For example, low self-esteem was correlated with childhood sexual abuse in a large sample of adolescent mothers (Meyers & Battistoni, 2003). In a sample of both pregnant and nulliparous adolescents, Milan et al. (2004) found that childhood physical abuse was related to emotional distress, and that for adolescents with elevated rates of emotional distress over time, pregnant adolescents reported a greater number of histories of maltreatment.

Contrary to other findings, Leaman and Gee (2008) found that rates of anxiety and depression were higher among young adult mothers who experienced IPV than among adolescent mothers who experienced the same trauma. The authors suggest that rates of anxiety and depression may be lower among adolescents because adolescent mothers may not see themselves as victims and may actually fight back, therefore exhibiting more externalizing than internalizing behaviors when confronted with violence from their partners (Leaman & Gee, 2008).

Aggression and other externalizing factors. A number of studies point to the relation between externalizing behaviors and the experience of trauma (Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Kennedy & Bennett, 2006; Lansford et al., 2007; Mitchell, et al., 2009; Mylant & Moran, 2008; Weimann, Agurcia, Berenson, Volk, & Rickert, 2000). For example, Kennedy and Bennett (2006) found that more than two-thirds of their participants reported behavior problems and attention problems. Mitchell et al. (2009) found that mothers who directly experienced violence as well as those who witnessed violence reported significantly more aggression than mothers with no history of direct or indirect violence exposure. Finally, Weimann, Agurcia, Berenson, Volk, and Rickert (2000) found that both battered adolescents and their battering partners were more likely to engage in non-conforming behaviors like using a weapon than were non-battered adolescents.

Overall we find that externalizing behaviors, such as aggression, are significantly higher among traumatized adolescents mothers (Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Lansford et al., 2007; Mylant & Moran, 2008). These findings are particularly important to keep in mind when considering the link between trauma experience and parenting behaviors among adolescent mothers.

Relational factors. A number of relational factors were also found to correlate with the experience of trauma among adolescent parents. These factors include relationship difficulties with parents, levels of social support, and age differences between adolescent mothers and their partners (Adams & East, 1999;

Ammerman et al., 2009; Ammerman, Putnam, Chard, Stevens, & Van Ginkel, 2011; Bailey, Moran, & Pederson, 2007; Barnet, Liu, & DeVoe, 2008; Kennedy, 2007; Milan et al., 2004; Stevens, Ammerman, Putnam, & Van Ginkel, 2002; Sarri & Phillips, 2004; Weimann, Agurcia, Berenson, Volk, & Rickert, 2000; Weinman, Smith, Gev, & Buzi, 1998). A history of childhood sexual abuse was related to relationship difficulties among adolescent mothers, with mothers reporting fear of abandonment and difficulty establishing and maintaining trusting interpersonal relationships (Bailey, Moran, and Pederson, 2007). Intimate partner violence was also significantly related to reports of lower levels of family and partner support among adolescent mothers (Weiman, Agurcia, Berenson, Volk, & Rickert, 2000). Among pregnant and nulliparous adolescents, Adams and East (1999) found that abused teens reported the greatest age difference between themselves and their sexual partner as well as a younger age at first sexual encounter than these of teens with no history of abuse.

Studies have also identified factors that helped to explain the link between trauma exposure and participants' number and/or quality of social supports and partner conflict. These factors include homelessness (Kennedy, 2007), depression (Ammerman, et al., 2009; Barnet, Liu, & DeVoe, 2008; Stevens, Ammerman, Putnam, & Van Ginkel, 2002), comorbid PTSD and depression (Ammerman, Putnam, Chard, Stevens, & Van Ginkel, 2011), and emotional distress (Milan, et al., 2004). All factors were associated with lower perceptions of the number of supports available to the mother as well as the quality of the support offered to her.

Summary of psychological functioning among traumatized mothers.

Traumatic experiences are significantly related to adverse psychological functioning among adolescent mothers. As the literature points out, the experience of trauma is associated with a number of adverse psychological outcomes, such as PTSD, depression, self-esteem, emotional distress, high-risk behaviors, aggression, and relational difficulties.

The review also identifies a number of additional gaps in the literature. Although the experience of trauma among adolescents points to the increased risk of maladaptive functioning, little is known about PTSD among populations of adolescent mothers. We do know that depressive symptoms are associated with the experience of trauma among adolescent mothers *but* we also know that there are high levels of comorbidity among traumatized adolescent women (Ammerman, Putnam, Chard, Stevens, & Van Ginkel, 2011; Dixon, Howie, & Straling, 2005; Cauffman, Feldman, Waterman, & Steiner, 1998; Lipschitz, Rasmusson, Anyan, Cromwell, & Southwick, 2000).

Adolescent mothers with a history of trauma are also more likely to report lower self-esteem, more identity confusion, and more emotional distress than are nulliparous adolescents with a history of trauma and than non-traumatized adolescent mothers (Bailey, Moran, & Pederson, 2007; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Meyers & Battistoni, 2003; Milan et al., 2004). However, Leaman and Gee (2008) found that the rates of anxiety and depression among adolescent mothers experiencing IPV were lower than those of adult mothers with the same experiences. Leaman and Gee (2008) suggest that adolescent mothers

may not see themselves as victims and may actually fight back, therefore exhibiting more externalizing behaviors than internalizing ones when confronted with violence from their partners. Although the finding is limited to only one study, it is important to consider the impact that these externalizing behaviors may have on adolescent mothers' parental functioning. It is also important to consider the possibility that adolescent mothers may begin to exhibit higher rates of anxiety and depression the longer they are exposed to IPV.

Aggressive behaviors among traumatized adolescent parents have been identified in a number of studies (Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Kennedy & Bennett, 2006; Lansford et al., 2007; Mitchell, et al., 2009; Mylant & Moran, 2008; Weimann, Agurcia, Berenson, Volk, & Rickert, 2000). These findings point to not only the prevalence of externalizing factors among adolescent parents but also the association between these factors and trauma. Furthermore, the experience of continuing trauma, particularly IPV, may be confounded by potential pressure by the battering partner to engage in high-risk behaviors that at times may be considered status offenses or criminal.

Studies found that traumatized adolescent mothers reported more relationship difficulties with their own parents, lower levels of social support, and greater age differences between themselves and their partners when compared to non-traumatized adolescent mothers, nulliparous adolescents, and adult mothers (Adams & East, 1999; Ammerman, et al., 2009; Bailey, Moran, & Pederson, 2007; Barnet, Liu, & DeVoe, 2008; Kennedy, 2007; Milan, et al., 2004; Stevens, Ammerman, Putnam, & Van Ginkel, 2002; Sarri & Phillips, 2004; Weimann,

Agurcia, Berenson, Volk, & Rickert, 2000; Weinman, Smith, Gev, & Buzi, 1998).

An indirect relation between trauma exposure and number of social supports as well as partner conflict has also been identified in the literature (Ammerman et al., 2009; Barnett, Liu, & DeVoe, 2008; Kennedy, 2007; Milan et al., 2004; Stevens, Ammerman, Putnam, & Van Ginkel, 2002). These studies suggest that the experience of trauma and these relational factors may be mediated by some of the consequences of trauma (e.g. depression and emotional distress).

Furthermore, Ammerman, Putnam, Chard, Stevens, and Van Ginkel (2011) found that mothers suffering from both PTSD and depression were more likely to report lower levels of social support than were mothers who only suffered from depression.

The literature does indicate that traumatized adolescent mothers may not be as psychologically equipped to handle parenting as non-traumatized adolescent mothers. The following section reviews what is known about parental functioning among traumatized adolescent mothers.

Impact of Trauma on Parenting among Adolescent Mothers

It is evident from the literature that adolescent mothers are exposed to high rates of trauma. The literature also points to the number of adverse psychological and behavioral outcomes experienced by these mothers. What does the added responsibility of parenting mean for these adolescents? How does their experience affect the way they think about parenting, the way they behave as parents, and the parenting decisions they make?

In this section I review the findings as they relate to parenting among traumatized adolescent mothers. First I review studies that focused on findings related to timing of pregnancy, number of pregnancies, and intent of becoming pregnant. I then review the findings as they pertain to health outcomes among traumatized adolescent mothers. Third, I review the literature as it pertains to the quality of parenting behaviors among adolescent mothers. I then review the findings that focus specifically on child abuse risk among traumatized adolescent mothers. Finally, because of the limited findings related to PTSD and parenting among adolescent mothers, I briefly review what is known about parenting outcomes among adult mothers with PTSD.

Pregnancy as a risk factor among traumatized youth. Pregnancy has been identified as an outcome among traumatized youth (Adams & East, 1999; Lansford et al., 2007; Sarri & Phillips, 2004). In fact, in a prospective study of 574 adolescents, Lansford et al. (2007) found that traumatized females were three times more likely to report being pregnant than were non-traumatized females. Studies have found links between a history of trauma, fears of infertility, and pressure to conceive by their partners (Rainey, Stevens-Simons, & Kaplan, 1995; Weimann, Agurcia, Berenson, Volk, & Rickert, 2000). Among 200 nulliparous adolescents (where 20% reported a history of childhood sexual abuse) abuse was not only related to more deviant behavior (i.e., alcohol use, drug use, and legal problems), but these adolescents were three times more likely to report that they were trying to conceive, had fears about infertility, and were in relationships where partners were pressuring them to become pregnant compared to non-

traumatized youth (Rainey, Stevens-Simons, & Kaplan, 1995). The authors conclude that traumatized adolescents may fear that if they wait too long they may not be able to conceive. Furthermore, the authors also note that adolescents may fear the negative repercussions of not giving in to their partners' desires to conceive. Weimann, Agurcia, Berenson, Volk, and Rickert (2000) also found that adolescent mothers who had been physically assaulted by their partners were more likely to report planned pregnancies than those with no history of assault, suggesting that IPV among adolescent mothers can include sexual coercion and manipulation by the partner to control the adolescent mother.

A handful of studies also found that a history of trauma may be linked to repeat pregnancies among adolescent mothers (Barnet, Liu, & DeVoe, 2008; Sarri & Philips, 2004). In a sample of adolescent mothers who reported low levels of trauma exposure, Barnet, Liu, and DeVoe (2008) found a significant relation between trauma exposure and depressive symptoms. They also found that mothers with higher levels of depression were at a higher risk for subsequent births within 24 months of giving birth to their first child. Sarri and Phillips (2004) found that almost one-quarter of mothers who reported an abuse history had a repeat pregnancy compared to 12% of mothers with no history of abuse.

Health outcomes of traumatized adolescent mothers. Although the findings are very limited, it is important to review the pre- and post-natal health outcomes related to a history of trauma among adolescent mothers. The potential adverse impact these outcomes may have on the mother and her developing fetus may be preventable. Renker (1999) found that abused adolescents gave birth to

lower weight infants, reported more miscarriages, and reported more emergency room visits than non-traumatized mothers. Although the authors did not assess trauma, Hodgkinson, Colantuoni, Roberts, Berg-Cross, and Blecher (2010) found that pregnant adolescents suffering from depression and reporting suicidal ideation were at a greater risk for delivering infants of lower birth weight than non-depressed and depressed mothers with no suicidal ideation. Furthermore, a number of studies included in this review found a significant relation between trauma history and a number of high-risk factors that directly and adversely affect healthy fetal development (i.e., substance use, tobacco use, and alcohol use) (Lesser, Koniak-Griffin, Gonzalez-Figueroa, Huang, & Cumberland, 2007; Martin, Clark, Lynch, Kupper, & Cilenti, 1999; Meyers & Battistoni, 2003; Mylant & Moran, 2008; Renker, 1999; Sarri & Phillips, 2004; Weimann, Agurcia, Berenson, Volk, & Rickert, 2000).

Quality of maternal behaviors. Trauma appears to have a negative impact on the quality of maternal behaviors among adolescent mothers. For example, childhood physical abuse and emotional abuse were related to decreases in maternal responsiveness (Bert, Guner, & Lanzi, 2009). Furthermore, among a group of first-time mothers receiving home visiting services, authors found that parental sense of control was negatively correlated with number of violent traumas experienced and depression scores (Stevens, Ammerman, Putnam, & VanGinkel, 2002). Mothers who experienced more traumas and had higher depression scores tended to feel a decreased sense of parental control, indicating

that cumulative trauma may better explain the relation between trauma and adverse parenting than any discrete traumatic experience.

Studies have also found a significant relation between trauma exposure and depression (Lesser & Koniak-Griffin, 2000; Mitchell et al., 2009). These studies found that depression scores among highly traumatized samples were significantly related to a number of parenting factors, indicating that psychological functioning following exposure to traumatic events may mediate the relation between trauma and parental functioning among adolescent mothers. In a small sample of primarily Latina adolescent mothers, Lesser and Koniak-Griffin (2000) found that chronic depression was significantly correlated with a lower quality of mother-child interactions. Depression symptoms were also related to a less stimulating home environment among a sample of mothers who reported a history of physical and sexual abuse and the witnessing of violence (Mitchell et al., 2009). In a later study, Ammerman et al. (2011) found that mothers with a comorbid diagnosis of depression and PTSD who reported higher avoidance/numbing symptoms were more likely to report higher levels of parental stress and lower acceptance scores (use of corporal punishment, criticism, scolding, restriction, and consideration of child's needs) than were mothers with lower avoidance and numbing symptoms. These findings indicate that it is not only the amount of traumatic exposures that are relevant but also the psychological outcomes that may be attributed to these exposures that adversely affect an adolescent mother's ability to engage in more positive parenting.

Child abuse risk. A number of studies found a significant relation between trauma exposure and child abuse risk (Bert, Guner, & Lanzi, 2009; Meyers & Battistoni, 2003; Mitchell, et al., 2009; Stevens, Ammerman, Putnam, & Van Ginkel, 2002). For example, mothers who were emotionally or physically abused were more likely to report a potential for child abuse (Bert, Guner, & Lanzi, 2009). Childhood physical abuse was also related to positive feelings about physical punishment in a sample of pregnant and/or parenting adolescents who were asked to report on their histories of physical abuse, sexual abuse, and IPV (Meyers & Battistoni, 2003). Finally, in a sample of adolescent mothers, most of whom witnessed acts of violence, Mitchell et al., (2009) found that higher depression and aggression scores were positively correlated with harsher disciplinary tactics. Harsher disciplinary tactics included a number of behaviors including the frequency with which the participants slapped or hit their children when they misbehaved, and the frequency with which the participants showed anger when they disciplined their children (Mitchell et al., 2009).

Summary of findings for pregnancy and parenting within the context of trauma. This review points to the experience of trauma as an important factor to assess in order to better understand the psychological functioning of adolescent mothers. Furthermore, we know little about how PTSD symptoms affect parental functioning among adolescent mothers.

The literature reveals high rates of trauma exposure and multiple adverse psychological outcomes among adolescent parents. For example, in a sample of 123 first-time mothers participating in a home visiting program, researchers found

that approximately 70% of the sample had experienced at least one violent trauma (Stevens, Ammerman, Putnam, & VanGinkel, 2002). These researchers also found that depression and the experience of violent trauma were related to greater child abuse risk and less maternal sense of control and social support, therefore establishing a confounding relation between trauma history, depression, and the risk of child abuse potential among adolescent mothers.

On average, adolescent mothers experience higher levels of stress and risk factors that may interfere with sensitive and emotionally available parenting than non-adolescent mothers. Furthermore, adverse childhood experiences, such as poverty and abuse, have been found to predict both adolescent pregnancy and adolescent psychopathology (Coley & Chase-Lansdale, 1998). As such, early childbearing may be an indicator of emotional distress among adolescent mothers (Milan et al., 2004). This hypothesis is supported by the fact that adolescent parents have reported more symptoms of emotional distress than have older mothers (Deal & Holt, 1998; Black et al., 2002; Woodward & Ferguson, 1999).

Trauma and its psychological consequences may be mechanisms that will allow us to better understand the roots of maladaptive parenting among adolescent parents. Symptoms of PTSD include skewed cognitions, particularly distorted perceptions of one's environment and of others' intentions towards us. These distortions have been related to child abuse potential, therefore increasing the risk of perpetuating the cycle of trauma (Schechter et al, 2005; 2006).

Overview of PTSD and Parental Functioning among Adult Mothers

Findings suggest that a parental history of trauma and/or the experience of PTSD symptoms not only adversely affect parental functioning but also long-term child outcomes. Scheeringa and Zeanah (2001) suggest that adult parents who are experiencing avoidance and withdrawal symptoms (requirements for a PTSD diagnosis) may be unable to correctly interpret their children's behavioral cues and may not respond sensitively to these cues. Studies of adult mothers with a history of childhood sexual abuse found that these mothers had difficulties with boundary dissolution, were found to be more permissive, and were more likely to use harsh physical discipline than mothers with no history of childhood sexual abuse (see DiLillo & Damashek, 2003; Reid-Cunningham, 2009).

Cohen, Hien, and Batchelder (2008) found that cumulative trauma was significantly related to a variety of parental functioning factors, such as increased child abuse potential, more severe parental punitive behavior, more psychological aggression, and more physical discipline, indicating that mothers with more experiences of trauma are more likely to engage in adverse parenting outcomes. The authors also found that particular traumatic experiences were significantly related to certain parenting outcomes. For example, a history of childhood sexual abuse was significantly correlated with higher child abuse potential and psychological aggression. A history of childhood physical abuse was significantly correlated with higher child abuse potential, parental punitive behavior, psychological aggression, and physical discipline. Both witnessing violence during childhood and IPV during adulthood were significantly correlated

with child abuse potential. However, witnessing violence during childhood was significantly related to parental punitive behavior whereas IPV was related to parental discipline. Although a diagnosis of PTSD was not significantly related to child abuse potential, punitive behavior, or psychological aggression, the authors did find that PTSD was negatively related to physical discipline, indicating that parents with PTSD were less likely to engage in physical discipline. Cort, Toth, Cerulli, and Rogosch (2011) found that a mother's childhood experience of cumulative maltreatment (i.e., physical abuse, sexual abuse, and emotional abuse) was a robust predictor of her own child's experience of cumulative maltreatment. The authors also found that a mother's childhood experience of cumulative maltreatment predicted her exposure to IPV. Cort, Toth, Cerulli, and Rogosch (2011) found no mediating link between psychological distress (i.e. depression and PTSD), mother's childhood experience of cumulative maltreatment and the child's experience of cumulative maltreatment.

Parental intrusiveness has also been found to be significantly associated with trauma. Moehler, Birigen, and Poustka (2007) found that mothers with a history of physical or sexual abuse were significantly more intrusive in interactions with their infants than were mothers with no history of trauma. The authors note that "intrusiveness in particular might prove to be a useful indicator or predictor of child maltreatment, as the latter can be preceded by discrete interactional alteration" (Moehler, Biringen, & Poustka, 2007, p. 626).

In a recent study of incest survivors, Fitzgerald, Shipman, Jackson, McMahon, and Hanley (2005) found that mothers reported less parenting self-

efficacy and poorer psychological adjustment. However, behavioral indicators show that these mothers' interactional styles were positive and comparable to those of non-abused mothers.

Among a sample of 174 women, Banyard, Williams, and Siegel (2003) found that mothers with high rates of trauma exposure reported less parenting satisfaction, more reports of child neglect, more use of physical punishment, and a history of child protective service reports. They also found that depression was significantly associated with trauma exposure, and that depression mediated the relationship between trauma exposure and parenting satisfaction. However, depression did not mediate the relation between trauma exposure and physical punishment, neglect, and reports of child abuse. These findings indicate that another mechanism may be responsible for predicting adverse parental outcomes in mothers with a history of exposure to multiple traumatic events, such as PTSD symptomatology. Conversely, the significant relation between a history of trauma exposure and depression, suggests that the comorbidity of depression and PTSD should be taken into account when studying the impact of trauma and PTSD on parental functioning. In fact, studies have found that PTSD is highly comorbid with various psychiatric disorders, including depression (Linning & Kearney, 2004; Kessler, Chiu, Demmler, & Walters, 1995). Dissociation has also been found to significantly mediate the relation between abuse history and abuse potential (Narang & Contreras, 2005).

Negativity of maternal attributions toward her child were found to be positively correlated with PTSD and depression symptoms; mothers reporting

higher symptoms of PTSD also reported more negative assertions about their children (Schechter et al., 2006). In an earlier study, Schechter et al. (2005) found that PTSD was significantly related to both distorted and disengaged classification of non-balanced mental representations on the Working Model of the Child Interview (WMCI), an interview that assesses the quality and content of parents' discourse regarding their child. Mothers with less severe PTSD symptoms were more likely to be classified as disengaged. Mothers with more severe PTSD symptoms were more likely to be classified as distorted. Overall, the discourse of mothers with PTSD can be classified as either emotionally distant or developmentally unrealistic/role-reversed. However, as already noted, studies have found that in some instances cumulative trauma may be a better indicator of suboptimal parenting than psychological distress (i.e., PTSD and/or depression) (Cohen, Hien, & Batchelder, 2008; Cort, Toth, Cerulli, & Rogosch, 2011).

Maternal PTSD has also been linked to a number of negative child outcomes. Hairston et al. (2011) found that women with PTSD were more likely to report higher levels of postpartum depression, difficulty bonding with their infants, and more sleep disturbances (including sleep anxiety) among their infants than did mothers with no PTSD. In another study, Schechter et al. (2007) found that the children of traumatized mothers were significantly less able to self-regulate negative affect than were the children of non-traumatized mothers. This inability to self-regulate may occur "because maternal traumatization impairs mothers' ability to assist their very young children in regulation of emotion and arousal during critical periods of their social-emotional development, thereby

interfering with development of self-regulation and the capacity to hold a protective and reflective caregiver in mind" (Schechter et al., 2007, p. 15). Emotional regulation difficulties were also found in infants of mothers with elevated PTSD symptoms. Bosquet Enlow et al. (2011) found that in later reunions following the still-face paradigm, children of mothers with elevated PTSD displayed greater dysregulation as evidenced by "bouts of hard crying...often with their eyes closed while engaging in behaviors such as distressed breathing, screaming, and back arching" (p. 498). These children also had a difficult time being soothed by their mothers. Furthermore, Bosquet Enlow et al. (2011) found that by the time these children were 13 months old, their mothers reported more externalizing, internalizing and dysregulation symptoms.

Within the context of a co-experienced trauma, Scheeringa and Zeanah (2001) propose a "relational perspective on PTSD" for understanding the direct and indirect effects of a traumatic event on parent-child dyads. They suggest that a parent with PTSD symptoms may actually behave in a way that exacerbates the symptomatology of a child. This relational perspective has direct implications for adolescent parents and their children, as research indicates that these parents are not only more likely to have a history of trauma but, along with their children, are also more likely to directly experience adverse events or live in communities where they are at a higher risk for witnessing adverse events (Luster & Brophy-Herb, 2000; Moore & Brooks-Gunn, 2002; Osofsky, Hann, & Peebles, 1993).

When compared to those without a history of trauma, traumatized adult mothers engage in significantly more maladaptive parenting behaviors and

cognitions. After experiencing a variety of traumas during their childhood and adulthood, some women become mothers and assume roles in which they see children as equals or caretakers, resulting in permissiveness and boundary dissolution. Mothers may also have a difficult time individuating themselves therefore behaving in an intrusive way. Some mothers also experience their children as threatening or the mothers lack a sense of control in interactions with their children, as a result they engage in physical discipline, psychological aggression, or neglect. Their role as a parent may bring up issues such as a decreased sense of parental efficacy, less parental satisfaction, and difficult psychological adjustment. Because of increased child abuse potential among mothers with a history of trauma, these mothers also have higher rates of involvement with social services (Dixon, Brown, & Hamilton-Giachritsis, 2005).

Mothers with PTSD also appear to have a number of parenting difficulties, primarily in the realm of cognitions. For example, mothers with PTSD may have difficulty correctly interpreting their children's emotions (Scheeringa & Zeanah, 2001). Furthermore, by incorrectly interpreting emotions, mothers may attribute more negative emotions and intentions to their children (Schechter et al., 2005; 2006). This error may result in difficulties in children's own development of emotional self-regulation (Bosquet Enlow et al., 2011). These mothers may also engage in role-reversal, where they have inappropriate relational expectations of their children, treating them like partners or expecting their children to take on a caregiving role. Finally, mothers with PTSD may be more emotionally distant when compared to mothers without PTSD.

The Prevalence and Consequence of Trauma Among Adolescents

Adolescence is a major transition period characterized by an increased assertion of independence, role exploration, and increased regard for peer acceptance, as such this developmental period also presents a unique opportunity for youth to take more responsibility for their overall well-being (Gandoli, 1999). Although this developmental period presents a unique opportunity for youth to take control of significant areas of their lives, many adolescents report engaging in activities that are traumatic or could result in a traumatic outcome. For example, the Centers for Disease Control and Prevention (2004) found that nine percent of adolescents reported experiencing dating violence within a 12 month period; eight percent reported having been forced to have sexual intercourse; 14% reported having had more than four sexual partners in their lifetime; 23% reported using drugs or alcohol before last sexual intercourse; and 71% of all deaths among adolescents are a direct result of engagement in risk behaviors. In fact, adolescents with histories of childhood abuse have been found to engage in more sensation-seeking behaviors as well as increased HIV related risk behaviors than youth with no history of childhood abuse (Bornovalova, Gwadz, Kahler, Aklin, & Lejuez, 2008).

Once they have experienced trauma, adolescents appear to be at a greater risk for experiencing PTSD than are adults (Giaconia et al., 1995; Kessler et al., 2005). Furthermore, adolescents living in the inner-city and other high-risk contexts report experiencing more traumatic events in their lifetime than do

adolescents in lower risk contexts (Buka, Stichick, Birdthistle, & Earls, 2001; Macy, Barry, & Noam, 2003). Research also indicates that these high-risk adolescents are also more likely to have PTSD (Buka, Stichick, Birdthistle, & Earls, 2001; Cauffman, Feldman, Waterman, & Steiner, 1998; Dixon, Howie, & Starling, 2005; Horowitz, Weine, & Jekel, 1995). In fact, Garrido, Culhane, Raviv, and Taussig (2010) found that exposure to community violence was a better predictor of trauma symptoms (i.e. PTSD and dissociation) than was exposure to family violence among a group of maltreated youth in foster care. Moreover, in a meta-analysis of community violence studies, Fowler, Tompsett, Braciszewski, Jacques-Tiura, and Baltes (2009) found that direct exposure to, witnessing, and hearing about community violence all equally predicted PTSD among children and adolescents.

High PTSD symptomatology is associated with adverse outcomes among adolescent groups. For example, adolescents with PTSD and/or partial PTSD symptomatology are more likely than youth without trauma to report behavioral, emotional, academic, and health problems, as well as interpersonal difficulties, and suicidal behaviors (Giaconia, et al, 1995; Linning & Kearney, 2004; Weine, Becker, Levy, Edell, & McGlashan, 1997). In studies of adolescent girls, those with PTSD reported more comorbid diagnoses, depressive symptoms, substance use, nicotine and marijuana use, suspensions from school, and more arrests (Dixon, Howie, & Straling, 2005; Cauffman, Feldman, Waterman, & Steiner, 1998; Lipschitz, Rasmusson, Anyan, Cromwell, & Southwick, 2000). Girls with PTSD also reported experiencing significantly more types of trauma than did girls

with partial PTSD and no PTSD (Horowitz, Weine, & Jekel, 1995; Lipschitz, Rasmussen, Anyan, Cromwell, & Southwick, 2000).

Theoretical Framework for Understanding the Impact of Trauma among Adolescents

The review of the literature has clearly indicated that certain adolescent populations (i.e., impoverished, minority, parenting) experience extensive trauma before reaching adulthood, and that the impact of trauma among these populations is quite complex. For one, the literature is limited by the fact that there is little understanding about the relation between trauma and PTSD *among adolescent mothers*. Second, comorbidity is present among participants in a number of studies of parenting and non-parenting traumatized adolescents, suggesting that the experience of trauma may have a greater impact on adolescents than adults (Ammerman, Putnam, Chard, Stevens, & Van Ginkel, 2011; Dixon, Howie, & Straling, 2005; Cauffman, Feldman, Waterman, & Steiner, 1998; Lipschitz, Rasmussen, Anyan, Cromwell, & Southwick, 2000). There are a number of theoretical frameworks that allow for a better understanding of the complexity of how trauma impacts the lives of adolescent mothers. In this section, I briefly review two theoretical frameworks: those of developmental psychopathology and of Complex PTSD. I also review the literature regarding our conceptualization of the factor structure of PTSD among adult and adolescent populations; these analyses suggest that the criteria for PTSD found in the DSM-IV-TR (APA, 2000) may not adequately capture the dimensional nature of mood and anxiety disorders (Watson, 2005).

Developmental Psychopathology. Developmental psychopathology

posits that

unlike some scientific and clinical approaches that may describe, treat, or conceptualize psychopathology as if it were a static entity (e.g. something the person has), developmental psychopathologists delve into the dynamic, ontogenetic processes that underlie psychopathology. The assumption is that the psychopathology results from complex interplay of multiple influences that change over the course of human development. Accordingly, risk factors and patterns of adaptation to risk are constantly changing, with implications for current as well as future functioning (Cummings, Davies, & Campbell, 2000, p.18).

Developmental psychopathology serves as an effective framework for understanding the impact of trauma on the lives of adolescents because it allows for a more fluid conceptualization of how trauma may affect various domains of functioning over time. Overall, developmental psychopathology is concerned with three key issues: 1) understanding causal processes; 2) the concept of development; and 3) continuities and discontinuities between normality and pathology (Rutter & Sroufe, 2000). As noted by Cicchetti and Toth (2009), developmental psychopathology also allows for a more detailed understanding of the various pathways (i.e., type and number of traumatic experiences) that may result in maladaptive functioning among traumatized youth, particularly PTSD (i.e., equifinality). In addition, this framework facilitates a better understanding of the various outcomes (positive and negative) associated with trauma (i.e., multifinality).

Developmental psychopathology is useful in investigating why rates of PTSD are much more prevalent during childhood and adolescence than in adulthood. For example, violations of trust and sense of safety that begin earlier

in life may prove to be more detrimental than traumas experienced only during adulthood. In fact, there is growing evidence indicating that adverse experiences, specifically traumatic ones, that accumulate over time and begin during childhood, significantly and negatively impact individual's psychological and physical health well into adulthood (Corso, Edwards, Fang, & Mercy, 2008; Dube et al., 2009; Felitti et al., 1998; Shonkoff, 2010; Shonkoff, Boyce, & McEwen, 2009).

Developmental psychopathology is also a helpful framework in that it allows researchers to consider the change or continuity in PTSD over time by investigating the factors that influence that continuity and discontinuity. Finally, developmental psychopathology allows us to question and further investigate whether diagnostic criteria established with adult populations are appropriate to use among populations of adolescents.

In line with studies investigating PTSD, Rutter and Sroufe (2000) note that although the field of psychiatry distinguishes between a number of disorders (i.e., depression and anxiety), a number of symptoms for these disorders often overlap. In other words, comorbidity or the co-occurring of separate mental health disorders simultaneously within one person often seen in clinical samples. What can we understand from this co-occurrence? Rutter and Sroufe note that, "results may be artifactual-deriving from mistaken assumptions in diagnostic concepts and boundaries. Or are intercorrelated risk factors. Or the presence of one form of psychopathology may, through its effects, constitute a risk mechanism for another form of psychopathology" (p. 283).

Overall, developmental psychopathology sets the foundation for approaching mental health disorders as dynamic processes with varying trajectories and outcomes. Through this lens, trauma likely has a different impact on adolescents than it does on adults and that the mental health trajectories among adolescents vary over time.

Complex PTSD. Complex PTSD provides a framework for better understanding the impact of cumulative and chronic trauma. The literature clearly points out that many adolescents in high-risk environments, whether pregnant or nulliparous, experience extensive trauma exposure before reaching adulthood (Buka, Stichick, Birdthistle, & Earls, 2001; Horowitz, Weine, & Jekel, 1995; Lipschitz, Rasmusson, Anyan, Cromwell, & Southwick, 2000; Macy, Barry, & Noam, 2003). Not only are these adolescents exposed to a variety of discrete traumatic events, but many of them are also survivors of prolonged or chronic trauma exposure (i.e., child abuse, witnessing IPV, or chronic community violence). Complex PTSD then may be a necessary consideration when investigating the psychological functioning of certain adolescent groups. In fact, in their work for the DSM field trial of Disorders of Extreme Stress Not Otherwise Specified (DESNOS), van der Kolk, Roth, Pelcovitz, Sunday, and Spinazzola (2005) noted that "trauma has its most pervasive impact during the first decade of life and becomes more...like 'pure' PTSD, with age. However, participants' DESNOS symptoms may have been a function of not only the age at which they were first traumatized, but also the number of traumatic experiences they subsequently suffered" (p. 395).

Our lack of understanding about the impact of trauma on the psychological and parental functioning of adolescent mothers is also compounded by the fact that over the last decade there has been a concerted effort to differentiate the impact of chronic/cumulative trauma over the experience of a single traumatic event. In her seminal work on trauma, Herman (1992; 1997) introduced a new typology for the symptoms experienced by individuals with chronic trauma exposure. Herman (1992; 1997) called it *complex post-traumatic stress disorder* (Complex PTSD) and described it as alterations in 1) affect regulation; 2) consciousness; 3) self-perception; 4) perception of the perpetrator; 5) relations with others; and 6) systems of meaning due to "a history of subjection to totalitarian control over a prolonged period (months to years). Examples include hostages, prisoners of war.....survivors of domestic battering, childhood physical or sexual abuse, and organized sexual exploitation" (Herman, 1997, p. 121).

Along with Herman (1992; 1997), Ford and Courtois (2009) noted that cumulative and/or chronic trauma has an adverse impact on a person's functioning that may not be adequately captured by the criteria for PTSD. Ford and Courtois (2009) defined cumulative or chronic trauma as *complex psychological trauma* "resulting from exposure to severe stressors that 1) are repetitive and prolonged; 2) involve harm or abandonment by caregivers; 3) occur at developmentally vulnerable times in the victim's life, such as early childhood or adolescence" (p. 13).

Herman's (1992; 1997) and Ford and Courtois' (2009) definitions of trauma differ from that of the DMS-IV-TR (APA, 2000). The event is not singular, can occur over an extended period of time, can include abandonment, and the impact on the developmental process of the individual is accounted for. Chronic and cumulative exposure to trauma has been well documented among several groups of adolescents, including mothers. For example, Ammerman and colleagues (2009) found that over two-thirds of mothers in their sample experienced more than one traumatic event; Kennedy and Bennett (2006) found that 75% of their participants (adolescent mothers) reported experiencing at least three types of violence; Meyers and Battistoni (2003) found that childhood physical abuse and childhood sexual abuse frequently co-occurred in their sample of adolescent mothers; and Sarri and Phillips (2004) reported that 69% of their participants (pregnant and parenting adolescents) reported experiencing more than 13 stressful events (i.e., family substance abuse and community violence).

In line with a developmental psychopathology framework, a Complex PTSD approach takes into consideration dynamic processes. van der Kolk, Roth, Pelcovitz, Sunday, and Spinazzola (2005) point out that psychological functioning is not only affected by the number of traumatic events experienced but also by the age of the victims when the events occurred. The model of Complex PTSD proposes a better framework for considering the differential impact of chronic/cumulative trauma over time than the PTSD model found in the DMS-IV-TR (APA, 2000). Complex PTSD also allows us to conceptualize a better

taxonomy of symptoms for understanding this impact of chronic/cumulative trauma.

Developmental psychopathology and Complex PTSD represent promising frameworks in helping us understand the impact of trauma on psychological functioning among adolescent mothers. Rather than exploring the discrete impact of one particular mental health disorder on the functioning of an individual, these frameworks suggest that it may be better to consider the interconnectedness of symptomatology. They also point to the importance of measuring individual changes that occur over time.

Keeping both the developmental psychopathology and Complex PTSD frameworks in mind, current literature indicates that the three factor structure of PTSD listed in the DSM-IV-TR (APA, 2000) may not appropriately capture the disorder among adult populations (Asmundson et al., 2000; Asmundson, Stein, & McCreary, 2002; Asmundson, Wright, McCreary, & Pedlar, 2003; Elhai, Naifeh, Forbes, Ractliffe, & Tamburrino, 2011; King, Leskin, King, & Weathers, 1998; Simms, Watson, & Doeblinger, 2002). If the three factor structure is not appropriate for adult populations, what are the implications of its suitability for use with adolescent populations? The following section reviews the literature that proposes alternate factor structures for posttraumatic stress symptoms.

The factor structure of PTSD among adult and adolescent populations. The DSM-IV (APA, 1994) proposes a model of PTSD that consists of three symptom clusters: reexperiencing (Criterion B), avoidance/numbing (Criterion C), and hyperarousal (Criterion D). In order to meet full criteria for

PTSD, an individual must report one symptom in the reexperiencing cluster, three symptoms in the avoidance/numbing cluster, and two symptoms in the hyperarousal cluster. This three symptom cluster or factor structure of PTSD has often been criticized, with a number of researchers proposing various factor models that better fit or account for the structure of PTSD (King, Leskin, King, & Weathers, 1998; Simms, Watson, & Doeblinger, 2002).

A number of studies consisting of adult participants have found that a variety of models provide an improvement to the three factor structure of PTSD found in the DSM-IV (APA, 1994). In fact, factor analytic studies have yielded considerable support for a first order four-factor “numbing” model where the avoidance/numbing cluster of PTSD is disaggregated (Asmundson et al., 2000; Asmundson, Wright, McCreary, & Pedlar, 2003; King, Leskin, King & Weathers, 1998). For example, Litz (1992) argues that emotional numbing "is a selective emotional-processing deficit...chiefly manifested during symptomatic states (and is thus episodic in nature) and entails a muting of positively valenced responses and a heightened reactivity to negative events" (p. 429). Litz (1992) goes on to explain that the capability to respond emotionally to a variety of situations is intact but inaccessible because of activation of hyperaroused states or the reexperience of traumatic memories. For this reason Litz believed that numbing should be considered a separate factor from avoidance. In fact, Litz et al. (1997) found that symptoms of hyperarousal were more robust predictors of emotional numbing than avoidance symptoms as hypothesized by both Barlow (1998) and Foa and colleagues (1992).

Foa, Zinbarg, and Rothbaum (1992) proposed that avoidance and numbing should be disaggregated in the DSM criteria since both reflect different cognitive processes. These cognitive processes differ in that "avoidance may be driven by strategic psychological processes, whereas numbing may be mediated by more automatic psychological mechanisms resembling the ones underlying freezing behavior in animals" (Foa, Zinbarg, & Rothbaum, 1992, p. 231). In other words, avoidance is a strategic cognitive process, whereas emotional numbing is a result of expending large amounts of energy trying to reduce symptoms of hyperarousal and reactivity.

The *King model* or the *four factor numbing model* is one of the most prominent models found in the literature (Asmundson et al., 2000; Asmundson, Wright, McCreary, & Pedlar, 2003; Elhai et al., 2009; Elhai, Gray, Docherty, Kashdan, & Kise, 2007). King, Leskin, King, and Weathers (1998) found that a four factor, first order solution of the symptoms of PTSD, in which the avoidance/numbing cluster was separated into two separate clusters, was superior to three alternate models. The alternate models were as follows: 1) a two factor, correlated higher order solution where the first higher order factor included the correlated factors of reexperiencing and avoidance, and the second higher order factor that included the correlated factors of hyperarousal and numbing; 2) a single factor, higher order solution where reexperiencing, avoidance, hyperarousal, and numbing are all first order factors subsumed into a global second order factor of PTSD; and 3) a single factor, first order solution where all 17 PTSD symptoms load on a common factor.

Another model widely found in the literature is a four-factor model that includes intrusion, avoidance, hyperarousal, and dysphoria (Simms, Watson, & Doebbeling, 2002). This model is known as the *Simms* or *dysphoria* model and is based on theories that suggest that "anxiety and depressive disorders share a nonspecific component often referred to as *general distress* or *negative affectivity*, which includes both anxious and depressed mood as well as symptoms such as insomnia, irritability, and impaired concentration" (Simms, Watson, & Doebbeling, 2002, p. 637). In other words, the dysphoria factor may be considered a nonspecific component of PTSD that is more likely related to generalized conceptualizations of mood and anxiety disorders (i.e., depression, generalized anxiety). In this model, dysphoria is conceptualized as general distress and includes symptoms of numbing and hyperarousal. Simms and colleagues (2002) compared the *dysphoria* model to five other models: 1) a one factor model that contained all 17 PTSD symptoms; 2) a hierarchical two factor model (intrusion/avoidance, hyperarousal/numbing) (Taylor, Kuch, Crockett, & Passey, 1998); 3) the DSM-IV model; 4) a three factor model (intrusion/active avoidance, numbing/passive avoidance, and arousal) (Anthony, Lonigan, & Hecht, 1999), and 5) the four factor numbing model (King, et al. 1998). Although the original confirmatory factor analyses conducted by Simms and colleagues (2002) is limited by the fact that they did not use established tests of model superiority to compare non-nested models (i.e., Akaike information criterion, AIC/Bayesian information criterion, BIC), other studies have found support for

this model (Elhai et al., 2009; Elhai, Ford, Ruggiero, & Frueh, 2009; Elhai & Palmieri, 2011; Yufik & Simms, 2010).

A recently proposed five factor model (Elhai et al., 2011) has also received empirical support in the literature (Armour et al., 2012; Pietrzak, Tsai, Harpaz-Rotem, Whealin, & Southwick, 2012; Wang, Zhonquan, & Armour, 2011). Using a sample of female survivors of domestic violence, Elhai et al. (2011) found that a newly proposed five factor structure was a better fit to the data than the numbing model (King et al., 1998) or the dysphoria model (Simms et al., 2002). The *dysphoric arousal* or *five factor* model consists of the following factors: reexperiencing, avoidance, numbing, dysphoric arousal, and anxious arousal. In separating out dysphoric arousal symptoms (i.e., difficulty sleeping, irritability/anger, difficulty concentrating), Elhai et al. (2011) propose that these symptoms represent a separate factor that is not entirely accounted for in either the anxiety related hyperarousal factor of the numbing model (King et al., 1998), nor the depression related dysphoria factor of the dysphoria model (Simms et al., 2002). They note, "the dysphoric arousal symptom cluster may be a representation of (the) anxiety/depression hybrid." (p. 343). Support for the dysphoric arousal model has also been found in a sample of veterans and primary care patients (Armour et al., 2012). However, the authors do stress that the dysphoria model (Simms et al., 2002) may be a more parsimonious representation of PTSD's latent structure given the minimal difference in fit between the two models. Support for the dysphoric arousal model seems more conclusive among three separate samples of Iraq/Afghanistan veterans (Pietrzak et al., 2012).

Differences in the factor structure of PTSD have also been found in studies with youth. Sack, Seeley, and Clarke (1997) found that, among Cambodian refugee youth, a four factor model provided a good fit to the data. Similar to the numbing model (King, et al. 1998), this model consisted of the following four factors: intrusion, avoidance, numbing, and arousal. Unlike the numbing model (King, et al., 1998), each of the 17 symptom items loaded on to different factors.

Another model that has received empirical support is a three factor model where two constructs of avoidance are proposed: *active* and *passive*. Anthony, Lonigan, and Hecht (1999) fit a hierarchical three factor model to data from a large sample of hurricane exposed youth. They found that this model, with clusters of intrusion/active avoidance, numbing/passive avoidance, and arousal subsumed by a higher order factor fit the data well. These findings were later replicated in another study of children exposed to hurricanes (Anthony et al., 2005).

Stewart et al. (2004) used data from a sample of homeless youth to compare the numbing model (King, et al., 1998) to the DSM-IV model (APA, 1994). They found that the numbing model (1998) fit the data better than the DSM-IV (APA, 1994) model, concluding that among youth, avoidance and numbing symptoms should be disaggregated because they represent two separate symptom groups. This finding suggests that Foa, Zinbarg, and Rothbaum's (1992) conceptualization of avoidance and numbing, as two separate constructs, applies to younger traumatized populations. Similar support for the numbing

model was found using data from the National Survey of Adolescents (Saul, Grant, & Carter, 2008)³.

In another study that used data from the National Survey of Adolescents, Elhai, Ford, Ruggiero, and Frueh (2009) tested the two models that have garnered the most support among samples of traumatized adults: the numbing model (King et al., 1998) and the dysphoria model (Simms et al., 2002). The authors found that the dysphoria model with the removed dysphoria factor (Simms et al., 2002) was superior to the DSM-IV and the numbing models (King et al., 1998). The authors chose to remove the dysphoria factor from this model because "one interpretation of the Simms model is that the dysphoria symptom cluster should be deemphasized from the PTSD diagnosis" (p. 1961). Although the dysphoria model provided a better fit than other models in the study, the authors suggested that the numbing model "may serve as a compromise between accurately reflecting the disorder's distinct key components while not overhauling the diagnosis or substantially reducing its prevalence" (p. 1964). However, the authors also stressed that PTSD appears to be a dimensional disorder that should not be treated dichotomously (i.e., present versus not present), and that other models (i.e., dysphoria model) may be too conservative in diagnosing the disorder, leading to legitimate cases being ruled out.

Similar to adult samples (Armour, Elhai, Richardson, Ractliffe, Wang, & Elklit, 2012; Elhai, Biehn, Armour, Klopper, Frueh, & Palmieri, 2011; Pietrzak, Tsai, Harpaz-Rotem, Whealin, & Southwick, 2012), empirical support for the

³ Important to note that the article states that they used the four factor model proposed by Sack and colleagues, but the actual model tested was King's numbing model.

dysphoric arousal or five factor model has also been found among youth. In a sample of Chinese youth exposed to an earthquake, Wang, Zhonquan, and Armour (2011) found support for the dysphoric arousal model (Elhai et al., 2011). This model was compared to the numbing model (King, et al, 1998) and the dysphoria model (Simms, et al., 2002) and found to fit the data better. In examining the external convergent and discriminant validity, the authors found that four of the five factors (intrusion, avoidance, numbing, and anxious arousal) yielded significantly different correlations with external measures of anxiety when compared to depression.

The three factor structure of posttraumatic stress symptomatology proposed in the DSM has been invalidated in numerous studies with various populations of traumatized adults and youth. The model misfit has been demonstrated through a variety of methods using a vast array of validated measures, such as self-report measures and clinician led interviews. Numerous studies indicate support for two, four factor models of posttraumatic stress symptomatology: King et al's (1998) numbing model and Simms et al's (2002) dysphoria model. There also appears to be growing support for a five factor model of dysphoric arousal proposed by Elhai and colleagues (2011). In keeping with the developmental psychopathology framework, investigations of the factor structure of posttraumatic stress symptomatology can allow us to see whether the factor structure between adult and adolescent samples differ. Furthermore, the complex PTSD framework can allow us to investigate whether the factor structures of posttraumatic stress symptomatology differ by severity and

frequency of exposure. Finally, further exploration that includes external variables allows us to test construct validity and may help us to explain the high rates of comorbidity among traumatized populations, as Yufik and Simms (2010) state, "a well-fitting bifactor model would suggest the presence of a strong nonspecific factor that may help explain the high rates of comorbidity observed between PTSD and other mood and anxiety disorders" (p. 766). Although support for these three models (numbing model, dysphoria model, and dysphoric arousal model) exists among studies that include youth, we know little about the factor structure of posttraumatic stress symptomatology among high-risk adolescent populations, particularly adolescent mothers.

Engaging Traumatized Individuals in Treatment

Trauma, and the adverse consequences of these experiences are, quite evident among adolescent populations. Just as little is known about the relation between trauma and PTSD among adolescent mothers, we know little about how these mothers engage in treatment.

Overview of trauma survivors' involvement in treatment. Findings regarding treatment utilization among traumatized populations are variable (Gavrilovic, Schutzwohl, Fazel, & Priebe, 2005; Harvey, 1996; Koenen, Goodwin, Struening, Hellman, & Guardino, 2004; McCart, Smith, & Sawyer, 2010; New & Berliner, 2000; Switzer et al., 1999). In a national screening sample, Koenen, Goodwin, Struening, Hellman, and Guardino (2004) found that individuals with PTSD who were in treatment reported that their PTSD symptoms interfered more with their daily living and that they perceived a greater need for

psychological services than individuals with PTSD not receiving services.

Gavrilovic, Schutzwahl, Fazel, and Priebe (2005) also found that individuals suffering from higher levels of psychopathology tended to seek out more services. White participants were also more likely to seek out services than were minority participants (Gavrilovic, Schutzwahl, Fazel, & Priebe, 2005; Koenen, Goodwin, Struening, Hellman, & Guardino, 2004).

Gavrilovic and colleagues (2005) found that informal sources of support were often sought by those suffering from lower levels of PTSD, by women, and by younger participants. In her policy review, Lippman (2010) reported that adolescents tended to prefer seeking out informal sources of support rather than professional mental health services.

Although comorbidity may exacerbate the need for treatment, it may also interfere with effective treatment (Briere & Spinazzola, 2009; Ford & Courtois, 2009; Kearney, Wechsler, Kaur, & Lemos-Miller, 2010; Koenen, Goodwin, Struening, Hellman, & Guardino, 2004; Switzer et al., 1999). In a study of male youth, Miele and O'Brien (2010) found that almost half of these young men met criteria for PTSD but were primarily diagnosed with Attention Deficit/Hyperactivity Disorder or Oppositional Defiant Disorder. The authors also found that prior to participation in the study, the young men had not been directly questioned about their trauma histories. Although Miele and O'Brien's (2010) study consisted of only male participants, it is important to report their findings in relation to adolescent mothers as many services for these mothers do not have a standard for trauma assessment.

In line with Miele and O'Brien's (2010), Switzer and colleagues (1999) found that individuals with PTSD tended to be misdiagnosed and were more likely to seek out more services but also reported less satisfaction with the services they sought than their non-PTSD counterparts. Briere and Spinazzola (2009) also noted that a great number of treatment outcome studies often exclude individuals suffering from multiple psychological disorders from their studies therefore, little is known about the treatment effects of particular interventions among individuals suffering from comorbidities.

In a study of the perception of mental health services among African American women participating in home visiting programs, Leis, Mendelson, Perry, and Tandon (2011) found that therapy was often viewed as ineffective and that medical providers were often trying to force participants to take medications. Participants also feared that participation in therapy might interfere with their ability to acquire employment and in more severe cases participants feared losing their children to child protective services. In order to facilitate mental health treatment seeking, Leis, Mendelson, Perry, and Tandon (2011) suggested that "home visiting programs could provide information about types of mental health care providers, available treatment options, the range of issues for which individuals might seek mental health services...(and) confidentiality/privacy policies" (pg. 318). However, the authors also noted that,

Home visiting programs and similar agencies should be aware of the possibility that employee perceptions may affect client use of mental health services. Home visitors, particularly paraprofessionals, may lack in-depth knowledge about mental health problems and services and might communicate their own perceptions of services rather than providing the client with objective information. This scenario, combined with our

finding that some home visitors perceive mental health care providers negatively themselves, suggests that providing education and training for home visitors around mental health services might be as important as educating women themselves. Furthermore, home visiting staff should be trained to conduct routine mental health screenings throughout the perinatal period and to help clients to engage in mental health care when indicated. (p. 318)

A number of factors appear to interfere with necessary treatment utilization, these include, for example, chronicity of PTSD symptoms, high comorbidity, unwillingness to discuss traumatic experiences, and stigma around mental illness (Foa, Keane, & Friedman, 2000; Harvey, 1996; Switzer, et al., 1999). However, studies also indicate that a number of highly symptomatic individuals often seek out services (Gavrilovic, Schutzwohl, Fazel, & Priebe, 2005; Koenen, Goodwin, Struening, Hellman, & Guardino, 2004), but it appears that PTSD may often go undiagnosed (Miele & O'Brien, 2010; Switzer et al., 1999). Findings also indicate that youth and women tend to seek out informal supports more than do adults or men with PTSD (Gavrilovic, Schutzwohl, Fazel, & Priebe, 2005; Lippman, 2010). Although not specifically a study on service utilization among traumatized individuals, Leis, Mendelson, Perry, and Tandon (2011) have identified home visiting services as an important area that may help to address the mental health needs of traumatized adolescent mothers.

Barriers to engagement specific to adolescent mothers. Findings regarding engagement of traumatized adolescent mothers in treatment are rare. In terms of formal support systems, such as counseling or psycho-educational programs, adolescent parents with a history of trauma reported that they were rarely referred to programs or to people who would provide support in dealing

with their trauma (Sarri & Phillips, 2004; Weinman, Smith, Gev, & Buzi, 1998). This finding suggests that a number of adolescents do not have access to services that may aid them in improving the adverse impact of trauma. In fact, this may be true for youth in general. In their review, Kearney, Wechsler, Kaur, and Lemos-Miller (2010) note that a number of youth have limited access to cognitive-behavioral treatment, the most effective treatment of PTSD to date.

A history of trauma was also related to a number of adverse health outcomes and health seeking behaviors among adolescent parents (Renker, 1999; Sarri & Phillips, 2004). In a study of 139 adolescents, those who experienced abuse were more likely to report poor self-care practices during their pregnancy, poor self-care agency, higher rate of miscarriages, and more hospital visits during pregnancy (Renker, 1999). Sarri and Phillips (2004) also found that a history of physical and sexual abuse were related to reports of receiving less information regarding health and nutrition information among pregnant adolescents.

Similar to findings regarding health outcomes among traumatized adolescent mothers, findings that highlight help-seeking behaviors are also rare. In a study of 263 adolescent mothers, where approximately one-quarter of the sample reported a history of child abuse, participants were asked to report on their perceptions of the consequences of child abuse as well as their willingness to participate in these services (Weinman, Smith, Gev, & Buzi, 1998). The authors found that the majority of participants (97%) felt a course in parenting should be compulsory for all high school students. These pregnant and parenting participants (92%) also stated that they would be interested in attending a child

abuse prevention program. However, abused adolescents did report significant differences in their perceptions of child abuse. For one, the authors found that abused teens were more likely to identify child abuse as a problem in their community and they were also more aware of the existence of parenting programs in their communities. Secondly, abused mothers were less likely to identify a history of child abuse as a contributing risk factor for future child abuse. Finally, abused mothers were less likely to join support groups.

These findings indicate that, although traumatized adolescent mothers are aware of child abuse as a societal issue, they are less willing to attribute their own experiences of abuse as potential risk factors for abusing their own children. Furthermore, they are more aware of formal support systems in their communities but are less willing to participate in these systems. Although limited to only one study, these findings indicate a potential difficulty in engaging traumatized adolescent mothers in care.

Engaging Mothers with Mental Illness in Home Visiting Services

Home visitation could easily be identified as a gateway for services for a number of high-risk adolescent mothers. Home visitation services exist throughout the United States and aim to provide supportive services to parents at-risk for child maltreatment.

As stated earlier, in a study of African American women participating in home visiting services, Leis, Mendelson, Perry, and Tandon (2011) found that the client/provider relationship may provide an excellent opportunity for connecting mothers to mental health services. However, engaging them in home visiting

services could also be challenging. In the following section I briefly review the literature as it relates to home visiting services and program utilization, specifically, program usage among participants with mental illness. Due to the lack of literature regarding program use among participants with PTSD, my focus was on mental illness in general.

Overview of home visiting services. Home visiting programs aim to improve outcomes among high-risk families. More specifically, these programs attempt to reduce the risk of child maltreatment by providing in-home services to pregnant women and families with young children. They do so by providing parental and child health education, parenting education, and social support (Donelan-McCall, Eckenrode, & Olds, 2009; Galano & Schellenbach, 2007; Howard & Brooks-Gunn, 2009).

Home visiting has been a widely used strategy over the past three decades and the majority of states in the U.S have adopted some variation of well-established models, for example, Healthy Families America (2008), Nurse Family Partnership (2006), Parents as Teachers (2008). In fact, over 400 programs now exist across the United States (Ammerman, Putnam, Bosse, Teeters, & Van Ginkel, 2010). Home visiting services provide a mother and her child a formal support system via the assignment of a nurse or paraprofessional home visitor. Home visits are scheduled to occur on a regular basis (i.e., weekly, bi-monthly, or monthly) and a number of additional services are offered (i.e., groups, referrals, social outings). Although home visit curriculum often varies by program, in general, home visitors aim to maximize a mother's prenatal health, increase her

child development knowledge, as well as help her create a safe environment in which to raise her infant (Harding et al., 2007).

Program goals can only be met if services are rendered, and program utilization has been found to be a key issue in determining the effectiveness of these programs (Howard & Brooks-Gunn, 2009). However, the literature indicates that there is no consensus in how the construct of program utilization is defined (Ammerman et al., 2006; Damashek, Doughty, Ware, & Silovsky, 2011; Duggan et al., 2000).

Program utilization. There is no standardized method for conceptualizing program utilization. This lack of standardization has resulted in a number of divergent findings (Ammerman et al., 2006; Damashek, Doughty, Ware, & Silovsky, 2011; Nievar, Van Egeren, Pollard, 2010; Stevens, Ammerman, Putnam, & Van Ginkel, 2002). In their meta-analysis of home visiting services, Nievar, Van Egeren, and Pollard (2010) found that among the 29 studies, program utilization was generally defined as *frequency of visitation*. They found that the definition of frequency (represented by number of visits per month) varied by study, with some studies reporting both scheduled visits and completed visits, and other studies reporting frequency but no differentiation between scheduled or completed visits. Home visitation frequency was related to maternal behavior in that programs that reported more frequency also reported improvements in maternal behavior.

Recognizing that there are often fluctuations in the consistency of home visits over time, Ammerman et al. (2006) operationalized engagement/program

use as 1) the duration or length of time active in the program; 2) quantity of home visits received; and 3) gaps in service between home visits. In an earlier study by Stevens, Ammerman, Putnam, and Van Ginkel (2002), engagement was defined as number of face to face activities (i.e., completed home visits) and support activities (i.e., telephone contacts). In a qualitative study by Stevens and colleagues (2005), the authors found that *program utilization* was a multidimensional construct that should quantify and qualify participants' experiences. In other words in addition to dosage (i.e., amount of visits within a particular time frame), researchers should aim to qualify the participant's experience by assessing the level and type of support received (i.e., instrumental/tangible, educational, emotional) from the home visitor.

In short, program utilization is a construct that incorporates a number of factors: 1) duration; 2) number of scheduled visits; 3) number of completed visits; 4) number of support activities (i.e., phone calls); 5) engagement in the process (i.e., home visitors' and clients' perceptions of how they are connecting with each other and whether or not they are gaining something from the program); and 6) gaps in service. Although findings are divergent depending on how utilization is defined, mental illness is often identified as a barrier to service provision.

Mental illness as a barrier to engaging in home visiting services. A number of studies on home visitation have elucidated the varying needs of participants. One need that consistently appears to be an obstacle for fully benefitting from services is mental illness (Ammerman, Putnam, Bosse, Teeters, & Van Ginkel, 2010; Ammerman et al., 2011; Damashek, Doughty, Ware, &

Silovsky, 2011; Duggan, Berlin, Cassidy, Burrell, & Tandon, 2009; Harden, 2010; Stevens, Ammerman, Putnam, Gannon, & Van Ginkel, 2005). Although a number of findings indicate that mothers suffering from depression are more likely to enroll and engage in services (Ammerman et al., 2006; Damashek, Doughty, Ware, & Silovsky, 2011), paraprofessional home visitors often report feeling ill-equipped to handle the needs and expectations of these mothers (Ammerman et al., 2010; Harden, 2010; Hebbeler & Gerlach-Downie, 2002; Stevens, Ammerman, Putnam, Gannon, & Van Ginkel, 2005).

Stevens, Ammerman, Putnam, Gannon, and Van Ginkel (2005) found that questions asked during the initial meetings or assessment may hinder the level of engagement among participants. As one participant noted, "you don't need to know all of my business, I just met you. Work on the relationship first, then you can ask me more in-depth questions" (p. 84). In this same study home visitors also noted that mothers suffering from mental illness were difficult to keep consistently engaged during visits. However, when engagement/program use was operationalized to capture fluctuations in participation, for example, number of months enrolled in the program compared to gaps in service between home visits, Ammerman et al. (2006) found that mental illness was significantly related with higher levels of duration and higher quantity of visits.

In an earlier study (Stevens, Ammerman, Putnam, & Van Ginkel, 2002), engagement was defined as number of completed home visits and telephone contacts. However, in a later study, Stevens, Ammerman, Putnam, Gannon, and Van Ginkel (2005) found that engagement also characterized the quality of the

interactions that took place. Therefore the authors suggest that engagement is a "multidimensional construct that reflects both quantity and quality of interactions" (p. 89). In fact, these authors note that some barriers to participation are the invasive nature of the intake process, mothers' misunderstandings around program goals, mental health problems, mothers' concerns about being report to Child Protective Services, home visitor difficulties in adapting curriculum to a mother's particular needs, and home visitor's lack of knowledge or experience in raising a baby. These are measurable barriers that can be targeted for change and that are not captured solely by counting the amount of home visits completed.

Findings regarding program utilization among mentally ill participants are sparse (non-existent for mothers suffering from PTSD) but they do indicate that program use among these participants is variable. This variability is dependent on how program utilization is operationalized. Studies have found that participants suffering from depression are more likely to participate in services but paraprofessional home visitors report having difficulty engaging these participants (Ammerman et al., 2010; Harden, 2010; Hebbeler & Gerlach-Downie, 2002; Stevens, Ammerman, Putnam, Gannon, & Van Ginkel, 2005). Given that avoidant behavior is a key construct in PTSD it would be important to assess if mothers with higher posttraumatic stress symptomatology differ from mothers suffering from depression, in that they are less likely to participate in services over extended periods of time.

Summary of Literature Review

The review of the literature clearly indicates that adolescent mothers are exposed to a variety of traumas throughout their lifetimes (Ammerman, et al., 2009; Bert, Guner, & Lanzi, 2009; Browne & Bassuk, 1997; Leman & Gee, 2008; Rickert, Wiemann, Harrykissoo, Berenson, & Kolb, 2002; Stevens, Ammerman, Putnam, & Van Ginkel, 2002). The literature also indicates that the experience of childhood trauma may increase the risk that adolescents will engage in risky behaviors and in turn, this will increase the likelihood of becoming pregnant (Adams & East, 1999; Lansford et al., 2007; Rainey, Stevens-Simons, & Kaplan, 1995). In fact, a number of studies have found that parenting adolescents are more likely to report trauma exposure than nulliparous adolescents (Adams & East, 1999; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Lansford et al., 2007). Studies have also found that, in certain instances, adolescent mothers are more likely to report trauma than adult mothers (Bert, Guner, & Lanzi, 2009; Browne & Bassuk, 1997; Rickert, Wiemann, Harrykissoo, Berenson, & Kolb, 2002). Furthermore, the literature shows that risk for traumatic exposure does not appear to decrease once an adolescent becomes pregnant or begins parenting. This places both adolescent mothers and their infants at risk for further traumatic exposure (Ammerman et al., 2009; Barnett, Liu, & DeVoe, 2008; Browne & Bassuk, 1997; Leman & Gee, 2008).

A history of trauma and ongoing exposure to traumatic events certainly impacts an adolescent mother's ability to function on a daily basis. As the literature points out, the experience of trauma is associated with a number of

adverse psychological outcomes, such as PTSD, depression, suicidal ideation, self-esteem, emotional distress, high-risk behaviors, aggression, and relational difficulties (Adams & East, 1999; Ammerman, Putnam, Chard, Stevens, & Van Ginkel, 2011; Bailey, Moran, & Pederson, 2007; Dixon, Howie, & Straling, 2005; Cauffman, Feldman, Waterman, & Steiner, 1998; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Kennedy & Bennett, 2006; Koniak-Griffin & Lesser, 1996; Lipschitz, Rasmusson, Anyan, Cromwell, & Southwick, 2000; Meyers & Battistoni, 2003; Milan, et al., 2004; Mitchell, et al., 2009; Mylant & Moran, 2008; Patchen, Caruso, & Lanzi, 2009; Sarri & Phillips, 2004).

This review also identifies a number of gaps in the literature. Although the experience of trauma among adolescent mothers points to the increased risk for maladaptive functioning, little is known about the prevalence and consequences of PTSD among this population. We do know that depression is associated with the experience of trauma among adolescent mothers *and* we also know that there are high levels of comorbidity among traumatized adolescent women (Ammerman, Putnam, Chard, Stevens, & Van Ginkel, 2011; Dixon, Howie, & Straling, 2005; Cauffman, Feldman, Waterman, & Steiner, 1998; Lipschitz, Rasmusson, Anyan, Cromwell, & Southwick, 2000), indicating that depression is only one of many outcomes to trauma.

There is a dearth of knowledge regarding the impact of trauma and PTSD on parental functioning among this population. Adverse childhood experiences, such as poverty and abuse, have been found to predict both adolescent pregnancy and adolescent psychopathology (Coley & Chase-Lansdale, 1998). As such, early

childbearing may be an indicator of emotional distress among adolescent mothers (Milan, et al., 2004). This hypothesis is supported by the fact that adolescent parents have reported more symptoms of emotional distress than older mothers (Deal & Holt, 1998; Black, et al., 2002; Woodward & Ferguson, 1999). Higher emotional distress may interfere with sensitive and emotionally available parenting, and may increase the risk for child maltreatment (Lesser & Koniak-Griffin, 2000; Mitchell et al., 2009; Stevens, Ammerman, Putnam, & Van Ginkel, 2002). Histories of trauma and adverse psychological functioning (i.e., depression) have also been linked to an increase in subsequent births among adolescent mothers (Barnet, Liu, & DeVoe, 2008; Sarri & Phillips, 2004). Investigating the psychological impact of trauma may allow us to better understand the roots of maladaptive parenting among adolescent parents. PTSD symptoms include skewed cognitions, particularly distorted perceptions of one's environment and others' intentions towards that individual. These distortions are related to child abuse potential, thereby increasing the risk of perpetuating the cycle of trauma (Schechter et al., 2005; 2006). Therefore, posttraumatic stress symptomatology may be an important factor in understanding the higher rates of maladaptive parenting among adolescent mothers.

Developmental psychopathology and Complex PTSD are promising frameworks that consider the interconnectedness of symptomatology rather than only exploring the discrete impact of one particular mental health disorder on the functioning of an individual. Furthermore, these lenses help in establishing the adequacy of the existing three factor structure proposed in the DSM-IV (APA,

1994). A range of these studies focused on its limitations and were conducted using adult populations (e.g., Asmundson et al., 2000; Asmundson, Wright, McCreary, & Pedlar, 2003; Elhai et al., 2011; Elhai et al., 2009; Elhai, Ford, Ruggiero, & Frueh, 2009; Elhai & Palmieri, 2011; King, Leskin, King & Weathers, 1998; Simms, Watson, & Doebbeling, 2002; Yufik & Simms, 2010). The few studies using adolescent populations that do exist also support the idea that the three factor structure of PTSD does not provide a good fit (Anthony, Lonigan, and Hecht, 1999; Anthony et al., 2005; Armour et al., 2011; Elhai, Ford, Ruggiero, & Frueh, 2009; Sack, Seeley, & Clarke, 1997; Saul, Grant, & Carter, 2008; Stewart et al., 2004; Wang, Zhonquan, & Armour, 2011). Nevertheless, the majority of these studies reference only one traumatic event and rarely, if ever, mention whether these adolescents have experienced cumulative trauma. Furthermore, no investigation of the factor structure of posttraumatic stress symptomatology has ever been conducted on a sample of adolescent mothers.

In terms of intervention, the literature does show that variability exists in how traumatized individuals seek out services (Gavrilovic, Schutzwahl, Fazel, & Priebe, 2005; Harvey, 1996; Koenen, Goodwin, Struening, Hellman, & Guardino, 2004; McCart, Smith, & Sawyer, 2010; New & Berliner, 2000; Switzer et al., 1999). Home visiting services could serve as an important gateway for connecting traumatized mothers with appropriate mental health screening and services (Leis, Mendelson, Perry, and Tandon; 2011). However, program utilization of home visiting services among mothers with mental illness appears to be highly variable (Ammerman, Putnam, Bosse, Teeters, & Van Ginkel, 2010;

Ammerman et al., 2011; Damashek, Doughty, Ware, & Silovsky, 2011; Duggan, Berlin, Cassidy, Burrell, & Tandon, 2009; Harden, 2010; Stevens, Ammerman, Putnam, Gannon, & Van Ginkel, 2005). Although some literature points out that mothers with depression tend to use home visiting more (Ammerman et al., 2006; Damashek, Doughty, Ware, & Silovsky, 2011), nothing is known as to how mothers with PTSD utilize these services. Specific PTSD symptomatology (i.e., avoidance) may suggest that mothers may be less likely to utilize home visiting services.

The Present Study

The overall goal of this dissertation was to deepen our understanding as to the experiences of traumatized adolescent mothers. More specifically, my study intended to: 1) explore the rates of trauma exposure and the types of trauma exposure adolescent mothers have experienced; 2) explore the prevalence of PTSD symptomatology among these adolescent mothers; 3) test the fit of alternate factor models of the posttrauma construct that have been substantiated among adult and adolescent populations but never among adolescent mothers; 4) explore the impact of depression on parenting behavior among adolescent mothers, as mediated by posttraumatic stress symptom factors; and 5) explore the relations between posttraumatic stress symptom factors and program utilization. Each study aim has a concurrent set of research questions and hypotheses, as stated below.

Research questions and hypotheses.

Aim 1: Explore the rates of trauma exposure and the types of trauma exposure the current sample of adolescent mothers have experienced.

***Research question 1:** On average, how many traumatic events have adolescent mothers been exposed to?*

Hypothesis 1: This sample of adolescent mothers will have high rates of trauma exposure, similar to other high-risk populations of adolescents.

***Research question 2:** To what kind of traumatic events have these mothers been exposed and what is the distribution of these events among this sample of mothers?*

Hypothesis 1: This sample of adolescent mothers will have been exposed to a greater variety of traumatic events than the two events commonly found in the literature (i.e., child maltreatment and IPV).

Hypothesis 2: Mothers will have high rates of exposure to community violence, witnessing community violence, and witnessing family violence, with rates similar to other high-risk populations of adolescents.

Aim 2: Explore the prevalence of PTSD symptomatology among these adolescent mothers.

***Research question 1:** What percentage of mothers meet the DSM-IV diagnostic criteria for PTSD?*

Hypothesis 1: The percentage of mothers who meet the criteria for PTSD will be similar to other high-risk populations.

Research question 2: *What percentage of mothers fit each of the three diagnostic criterion (reexperiencing, avoidance, hyperarousal) for PTSD?*

Hypothesis 2: The percentage of mothers fitting each of the three diagnostic criteria will be greater than the percentage who meet full criteria for PTSD.

Aim 3: Test the fit of alternate factor models of the posttrauma construct that have been substantiated among adult and adolescent populations but never among adolescent mothers (see Table 2 for proposed hypothesized factor structures).

Research question 1: *Of the four factor models proposed in the literature: 1) DSM model (APA, 1994), 2) numbing model (King et al., 1998), 3) dysphoria model (Simms et al., 2002), and 4) dysphoric arousal (Elhai et al., 2011), which provides the best fit to this sample of adolescent mothers?*

Hypothesis 1: Given the absence in the literature of confirmatory factor analyses for the factor structure of PTSD among adolescent mothers, this will primarily be an exploratory analysis. However, I do predict that the three factor DSM model will not be an acceptable fit to the data.

Aim 4: Using the best fitting model, explore the impact of posttraumatic stress symptom factors on parenting behavior among adolescent mothers.

Research question 1: *Are posttraumatic stress symptom factors significantly related to parental sensitivity?*

Hypothesis 1: Posttraumatic stress symptom factors will predict lower parental sensitivity among adolescent mothers. Specific factors will have a stronger relation to parental sensitivity but these are dependent on the best-fitting model identified in the third aim.

Research question 2: Do posttraumatic stress symptom factors mediate the relation between depression and parental sensitivity?

Hypothesis 1: Given high rates of comorbidity among trauma survivors, I predict the relation between depression and parental sensitivity will be mediated by posttraumatic stress symptoms factors. Specific factors will have a stronger relation to depression and parental sensitivity but these are dependent on the best-fitting model identified in the third aim.

Research question 3: Are posttraumatic stress symptom factors significantly related to parental non-hostility?

Hypothesis 1: Posttraumatic stress symptom factors will predict lower parental non-hostility among adolescent mothers. Specific factors will have a stronger relation to parental non-hostility but these are dependent on the best-fitting model identified in the third aim.

Research question 4: Do posttraumatic stress symptom factors mediate the relation between depression and parental non-hostility?

Hypothesis 1: Given high rates of comorbidity among trauma survivors, I predict the relation between depression and parental non-hostility will be mediated by posttraumatic stress symptoms factors.

Specific factors will have a stronger relation to depression and parental non-hostility but these are dependent on the best-fitting model identified in the third aim.

Aim 5: Using the best fitting model, explore the impact of posttraumatic stress symptom factors on program utilization among adolescent mothers.

Research question 1: *Are posttraumatic stress symptom factors significantly related to completed home visits?*

Hypothesis 1: Posttraumatic stress symptom factors will be significantly correlated with fewer completed home visits among adolescent mothers. Specific factors will be more significantly correlated with completed home visits but these are dependent on the best-fitting model identified in the third aim.

Research question 2: *Are posttraumatic stress symptom factors significantly related to number of groups attended?*

Hypothesis 1: Posttraumatic stress symptom factors will be significantly correlated with fewer groups attended among adolescent mothers. Specific factors will be more significantly correlated with number of groups attended but these are dependent on the best-fitting model identified in the third aim.

Research question 3: *Are posttraumatic stress symptom factors significantly related to number of completed secondary activities⁴?*

⁴ Secondary activities are actions taken by the home visitor to supplement visits to the mother and child, for example, phone calls or text messages. These activities are described in detail in the Method section.

Hypothesis 1: Posttraumatic stress symptom factors will be significantly correlated with fewer completed secondary activities among adolescent mothers. Specific factors will be more significantly correlated with completed secondary activities but these are dependent on the best-fitting model identified in the third aim.

Research question 4: *Are posttraumatic stress symptom factors significantly related to duration of enrollment in the program?*

Hypothesis 1: Posttraumatic stress symptom factors will be significantly correlated with less duration in the program among adolescent mothers. Specific factors will be more significantly correlated with duration but these are dependent on the best-fitting model identified in the third aim.

Chapter 3: Method

This study was conducted as part of the Massachusetts Healthy Families Evaluation (MHFE)⁵, a randomized, controlled trial of the implementation and effects of Healthy Families Massachusetts (HFM), a statewide home visiting program for young mothers. Prior to describing the methodology involved in this specific study, I will briefly describe the HFM program and components of the overall evaluation.

Healthy Families Massachusetts

HFM is a comprehensive, voluntary, newborn home visiting program for first-time parents ages 20 and under living in Massachusetts. This program is funded by the Massachusetts Children's Trust Fund (MCTF) and is based on the Healthy Families America model (Galano, 2005). HFM provides parenting support, information, and services to young parents, beginning prenatally and continuing until the child's third birthday. The program's five goals are to: 1) prevent child abuse and neglect by supporting positive, effective parenting; 2) achieve optimal health, growth, and development in infancy and early childhood; 3) encourage educational attainment, job, and life skills among parents; 4) prevent repeat pregnancies during the teen years; and 5) promote parental health and well-being. HFM services include home visits, goal-setting activities, group-based activities, and linkages and referrals to other resources. Service levels generally proceed as follows: weekly or biweekly home visits for participants during

⁵ The Massachusetts Children's Trust Fund provided funding for the evaluation of HFM. Co-principal investigators are M. Ann Easterbrooks, PhD, Francine H. Jacobs, EdD, and Jayanthi Mistry, PhD from the departments of Child Development and Urban and Environmental Policy and Planning at Tufts University.

pregnancy, followed by weekly home visits for six months after the birth of the baby, and then visits decreasing in intensity, as guided by indicators of family progress, until the child is three years old. HFM services are delivered by paraprofessionals hired based on a combination of factors, including experience working with families; knowledge of child development and family relationships; and numerous other characteristics, such as the ability to establish trusting relationships and willingness to work with culturally diverse populations. HFM staff complete a six-day core training at hire, and 10 additional topical trainings within the first year of employment. All home visiting staff (home visitors, supervisors, and program coordinators) receive weekly supervision (1-1.5 hours) by professionally trained staff.

MHFE-2: A Randomized, Controlled Trial

In 2008, the Tufts team began a second-cohort evaluation of HFM (MHFE-2) that consisted of a randomized controlled trial with two main components. The Impact Study, through its experimental design, allows for supported claims of program effects. The Integrative Study focused on specific issues (e.g., mental health, education, parenting, etc.) in participants and programs from particular communities, allowing for a more in-depth and comprehensive understanding of the contextual factors that influence participants' trajectories as they transition both to parenthood and adulthood.

MHFE-2 recruitment and sampling. Between February 2008 and October 2009, eligible participants (female, 16 years or older, new to HFM, either English- or Spanish-speaking, and cognitively able to provide informed consent),

seeking to enroll in HFM were recruited to participate in the evaluation. Once participants agreed to participate they were randomly assigned either to the “Home Visiting Services Group” (HVS; the program group), or the “Referrals and Information Only Group” (RIO; the control group). All participants took part in the Impact Study. As part of the Impact Study, each participant consented to release agency records to the evaluation (i.e., Department of Public Health, Department of Education, Department of Children and Families, and Department of Transitional Assistance) and participated in a 45-minute phone interview three times over two years.

As incentives, participants were offered gift cards to local stores in the following amounts: Time 1 (\$35 for HVS group; \$50 for RIO group); Time 2 (\$40 for HVS group; \$55 for RIO group); Time 3 (\$45 for HVS group; \$60 for RIO group). Higher incentives were offered to the RIO group in order to encourage prolonged participation in the evaluation given that they were not receiving home visiting services. Every participant in the Impact Study was also recruited into the Integrative Study. As participants in the Integrative Study of the evaluation, mothers were asked to participate in a one to two hour-long in-person interview that took place in a setting chosen by the mother. Similar to the Impact Study interview, the Integrative Study interviews took place three times over a two year period. Incentive levels for participants of the Integrative Study were the same as the Impact Study. Participants in the Integrative Study received two separate incentives, one for their participation in the Impact Study and one for the Integrative Study. Of the 689 participants included in the Impact study data

pool, a total of 477 participants agreed to participate in the Integrative study (HVS group: 277[58%] and RIO group: 200 [42%]). Data for this study were drawn from the 477 Integrative Study Participants.

Data collection procedure. Data were collected from all participants at three different time points (Time 1 [T1], Time 2 [T2], and Time 3[T3]) over a two-year period. This study used data from the T1 and T2 data points from all participants in the Integrative Study.

Impact Study participants were asked to provide information in the following areas: 1) demographics (age, birthplace, race, ethnicity, languages spoken, relationship status, employment status; level of education; housing status); 2) pregnancy/parenting status; 4) information on father of the baby (i.e., age, employment status, level of education, time spent with mother and /or baby); 5) economic resources; 6) formal and informal supports; 6) history of pregnancy; 7) family history of adolescent pregnancy; and 7) depression symptomatology.

In addition to data gathered during this Impact Study phone interview, Integrative Study participants were asked to provide information in the following areas: 1) program participation (i.e., reasons for enrolling, impression of home visitor) (HVS only); 2) timeline of significant life events; 3) community help-seeking behaviors; 4) quantity and quality of social supports; 5) family and education narratives; 6) health behaviors; 7) trauma and PTSD symptomatology; 8) representations of parenting; and 9) parenting stress. During T2, mothers and their children also participated in a ten minute video-taped interaction aimed at assessing parent and child behaviors during a free-play and teaching task.

Present Sample

The sample for this dissertation was derived from the pool of 477 Integrative Study participants and was comprised of 371 mothers who completed a measure of traumatic experiences and PTSD symptomatology (PTSD-RI; Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998).

Participants. At the time of the T1 intake interview, participants were, on average, 18.7 years old (*range* 16.08 to 21.38); 82% were under the age of 20. The racial and ethnic distribution of the participants was 37% White Non-Hispanic, 35% Hispanic (including multi-ethnic Hispanic), 20% Black Non-Hispanic, and 8% categorized as “Other” (including multiracial and Asian). The majority 89% of the mothers were born in the United States. English was the preferred language of 77% of participants. At the time of enrollment, 66% participants were pregnant.

Data sources. This study drew from the MHFE Impact and Integrative studies datasets. Data were also drawn from the Healthy Families Participant Database System (PDS). The PDS is a computerized system through which HFM is able to track participants' enrollment, home visit attendance, secondary activities, group participation, referrals, and individualized program goals. Tables three and four provide descriptive information on all study constructs for participants in the final sample used in this dissertation.

Measures

Participant Age. During the intake interview at T1, participants were asked to report their date of birth. Participants' ages were calculated using their date of birth and the T1 intake interview.

Participant race and ethnicity. Mothers were asked to identify their race and ethnic backgrounds. Ethnicity consisted of Hispanic/Latina or Non-Hispanic/Latina. Race included the following options: Black or African American, White, American Indian/Native American/Alaska Native, East Asian, South Asian, Native Hawaiian or Other Pacific Islander, or Other. A categorical variable with values representing race and ethnicity among participants was created. The variable consists of the following four categories (collapsing census race and ethnicity categories): 1) White (non-Hispanic); 2) Black/African American (non-Hispanic); 3) Hispanic; and 4) Other (consists of participants who classified themselves as "other"; multiracial, and Asian).

Maternal education status and employment status. During the intake interview at T1, participants were asked to report on the last grade completed, as well as their occupational status.

Relationship status. Mothers were asked about their relationship status with the father of the baby or another partner at T1. Relationship status included the following options: single, engaged/committed relationship with someone other than baby's father, engaged/committed relationship with father of the baby, married to someone other than father of the baby, married to father of the baby. A

categorical variable with values representing relationship status among participants was created.

Age of father of the baby. During the intake interview at T1, participants were asked to give the age of the father of the baby.

Living arrangements. During the intake interview at T1, participants were asked to report on their living arrangements.

Number of pregnancies. During the intake interview at T1, participants were asked to report the number of times they had been pregnant.

Pregnancy/parenting status. Mothers were asked whether they were pregnant or already parenting at T1.

Pregnancy planned. During the intake interview at T1, participants were asked to report whether their most recent pregnancy was planned.

Receiving mental health services. During the intake interview at T1, participants were asked whether at any time in their life they had received mental health services.

All of the above referenced demographic variables were used during preliminary analyses to identify statistically significant differences among primary variables of interest (i.e., traumatic events, posttraumatic stress symptomatology, and depression).

Maternal symptoms of depression. Maternal symptoms of depression were assessed using the Center for Epidemiological Studies-Depression (CES-D) scale (Radloff, 1977), a 20-item self-report questionnaire designed to assess depressive symptoms in the general population. The CES-D has demonstrated

strong psychometric properties in both clinical and epidemiological studies with diverse groups, including both adolescents and postpartum women (Campbell & Cohn, 1991; Radloff, 1991). Participants were asked to report how often they experienced symptoms of depression during the week prior to the date of their intake interview, each question is rated on a four-point Likert scale ranging from zero (not at all) to three (a lot; 5-7 days in the past week). In addition to a summary score, a clinical cutoff score is provided; scores higher than the clinical cutoff (score of 16) are considered to be “clinically significant”. The reliability and validity of the CES-D have been well-established, with 100% sensitivity with a clinical diagnosis using the cut-off scores, and 88% specificity (Radloff, 1977; Radloff & Locke, 1986). In this study Cronbach's alpha for the CES-D was .74, indicating acceptable internal consistency.

For the purposes of this study, this measure was used in three ways: 1) to determine the extent of depressive symptomatology among participants; 2) to determine the proportion of participants who met the clinical cut-off for depression; and 3) to test the relation between PTSD symptomatology and depression among participants.

Trauma Exposure and PTSD. Exposure to trauma and symptoms of PTSD was assessed using the adolescent version of the UCLA PTSD Reaction Index for DSM IV (PTSD-RI) (Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998). The PTSD-RI index is one of the most widely used instruments for assessing trauma and PTSD symptomatology among children and adolescents (Chemtob, Madan, Berger, & Abramovitz, 2011; Ellis, Lhewa, Charney, &

Cabral, 2006; Nygaard, Jensen, & Dyb, 2012; Rodriguez, Steinberg, Saltzman, & Pynoos, 2001; Roussos, Goenjian, Steinberg, Sotiropoulou, Kakaki, & Kabakos, 2005; Steinberg, Brymer, Decker, & Pynoos, 2004). The adolescent version of the PTSD-RI is a self-report instrument that screens for exposure to traumatic events (i.e., natural disasters, accidents, domestic violence, witnessing of domestic violence, community violence, witnessing of community violence, sexual abuse, medical illness, unexpected death, and any other event considered frightening by the respondent) and for all 17 DSM-IV PTSD (see Table 1 for a description of symptoms) symptoms in adolescents who report traumatic stress experiences. Respondents rate the presence (yes/no) of 13 discrete trauma experiences and one open-ended question - meant to elicit any experiences considered frightening, dangerous, or violent that do not fit into any of the 13 categories. If a traumatic event is endorsed as having occurred, the respondent continues on to complete symptom ratings. Respondents rate their frequency of PTSD symptoms on a 5-point Likert scale (0 = none to 4 = most of the time) over the most recent 30 day period.

This instrument is meant to serve as a brief screening tool to provide information regarding trauma exposure and PTSD symptoms. The items of the PTSD-RI indices are keyed to DSM-IV criteria and can provide preliminary PTSD diagnostic information. The items can be summed to form a severity score (0 to 68) or scored categorically, yielding a diagnostic categorization that maps on to DSM-IV criteria. The instrument has been reported to have high diagnostic validity, with a sensitivity of .93 and a specificity of .87, using a cut-off score of

38 (Steinberg, Brymer, Decker, & Pynoos, 2004). Alpha coefficients have demonstrated good to excellent internal consistency (Layne et al., 2001; Nygaard, Jensen, & Dyb, 2012; Roussos et al., 2004).

For the purposes of this study, this measure was used in three ways: 1) to determine the rates and types of trauma exposure; 2) to determine the rates of PTSD among participants; 3) to compare competing models of the factor structure of PTSD among adolescent mothers. In this study Cronbach's alpha was .90, indicating good internal consistency.

In order to determine the rates of trauma exposure, a variable was created that added all events endorsed by participants. Rates of PTSD among participants were determined by assigning all participants three scores for PTSD symptoms: 1) a Criterion B score (re-experiencing symptoms); 2) a Criterion C score (avoidance/numbing symptoms); 3) a Criterion D score (increased arousal symptoms). In addition to these scores, a categorical variable was created noting whether a participant met full, partial, or no criteria for a DSM-IV PTSD diagnosis.

Parent-child Interaction (Emotional Availability). Parent-child interactions were coded using the third edition of the Emotional Availability Scales (EAS) (Biringen, Robinson, & Emde, 1998). The Emotional Availability Scales assess a number of qualities in dyadic interactions between a caregiver and her child. Emotional Availability (EA) "refers to an individual's emotional responsiveness and affective attunement to another's needs and goals...it is not

simply mother's physical availability but her emotional availability that promotes infant's self expression." (Biringen, Robinson, & Emde, 1998, p. 4)

In this study I used two subscales representing maternal emotional availability; sensitivity and non-hostility. Sensitivity (9 point scale) is a construct that considers factors such as positive affect, clarity of perceptions, appropriate parental responsiveness, awareness of timing, variety and creative modes of play, conflict negotiation, and parental acceptance. A highly sensitive parent (score = 7-9) would, for example, "accurately (read) the child's signals, even subtle ones that may not be clear to an outsider, and (react) appropriately. She has a well-developed sense of timing and rhythmicity during interactions with transitions between activities appearing smooth rather than abrupt and (forced)" (Biringen, Robinson, & Emde, 1998, p. 25). Conversely, a highly insensitive parent (score = 1-3) may lack acceptance, creativity, and ability to negotiate conflict. She may also not respond to her child's cues and may have a limited understanding of child development. The parent may appear passive or depressed. In extreme situations, she may appear to forget that her child is present. A parent in the mid-range of the subscale (score = 4-6) will fluctuate in her sensitivity towards her child. This parent may accurately interpret her child's signals but her response may be delayed. She may also display an overall blandness of mood during the interaction and may inconsistently engage in activities with her child.

Non-hostility (5 point scale) is a construct that considers covert and overt hostile behavior such as, impatience, harshness, boredom, sarcasm, or physical aggression. A parent in the high-range of the non-hostility (score = 4-5) subscale

will show absolutely no overt or covert hostility towards her child. A parent in the low-range of non-hostility (score = 1-2) will display overt harsh, abrasive, and demeaning behavior during the interaction. In extreme cases, the parent may be physically harsh with the child during the interaction. A parent in the mid-range of the subscale (score = 3) will display signs of some covert hostility, such as, impatience, discontent, boredom, and resentment. The mid-range rating is meant to "pick up dysfunctional emotional regulation that is overcontrolled but nonetheless leads to leakage" (Biringen, Robinson, & Emde, 1998, p. 39).

The external validity of the EAS has been demonstrated in a number of studies (Biringen, 2000; Easterbrooks, Biesecker, & Lyons-Ruth, 2000; Easterbrooks & Biringen, 2005; Ziv, Aviezer, Gini, Sagi, & Koren-Karie, 2000). Emotional availability has been associated with quality of attachment, childhood history of abuse, and depression (Driscoll & Easterbrooks, 2007; Easterbrooks & Biringen, 2009).

In this study, inter-rater reliability was established by trained graduate students. Coders followed a three-step procedure for each of the videotaped segments. First, coders viewed the five-minute free play session to get a sense of the mother-infant dyad interaction. Second, coders viewed the segment again and took detailed notes about the interaction, focusing on specific behavioral examples of maternal sensitivity, structuring, and non-hostility. Finally, coders viewed the segment a third time in order to determine what final codes they would assign. This three step process was repeated for the videotaped teaching task. The majority of the time coders coded the free play portion followed by the

teaching portion during the same period of time. Coders were kept blind to pertinent information regarding the mother-child dyads (i.e. program participation and mother's age).

The team consisted of three coders. One coder was trained by Easterbrooks and Biringen and after completing her training this coder trained the remaining two coders. Coders achieved interrater reliability during an initial training period using 20 to 30 videotaped observations from a previous evaluation study. Interrater reliability for the sensitivity and non-hostility scales was assessed using average absolute agreement intraclass correlation coefficients (ICC) in a two-way random effects model (McGraw & Wong, 1996) and ranged from .88 to .91 ($M = .87$), indicating excellent reliability (Free play sensitivity = .91; Teaching task sensitivity = .90; Free play non-hostility = .90; Teaching task non-hostility = .88).

Following the training period, all three coders independently examined approximately 56% ($n=140$) of all videotaped interactions. In order to protect against observer drift, all three coders met on a regular basis to code independently and then discuss assigned codes. Disagreements beyond one-point were discussed until agreement was reached. For the post-training period, ICCs for sensitivity ranged from .75 to .93 ($M = .86$) and for non-hostility .83 to .90 ($M = .86$) indicating a range in reliability from good to excellent.

Program use. Program use among the HVS sample ($n=208$) in the Integrative Study was assessed by creating four continuous variables from data accessed from the Massachusetts Healthy Families Participant Database System

(PDS). The three variables were as follows: 1) *number of visits completed* consisted of the number of visits the participant received between T1 and T2; 2) *number of groups attended* consisted of the number of groups the participant attended between T1 and T2; 3) *number of completed secondary activities* consisted of the total count of completed non-visit related activities that occurred between T1 and T2. These activities included, phone calls, delivery of goods or documents, rides, emails, and text messages; 4) *time enrolled in the program or duration* consisted of the number of days the participant was enrolled in the program between T1 and T2. Each program use variable was analyzed independently in order to determine the relation between these variables and posttraumatic stress symptomatology.

Analytic Plan

In order to address all research hypotheses, descriptive and bivariate analyses were run using IBM SPSS 19.0. I used LISREL 8.8 (Jöreskog & Sörbom, 2007) to conduct confirmatory factor analyses in order to compare competing models of the structure of PTSD among adolescent mothers. The DSM-IV model was compared to three other models (see Table 2): 1) the four factor model of King et al. (1998); 2) the four factor model of Simms et al. (2002); and 3) the five factor model of Elhai et al. (2011). Chi-square tests of model fit were examined in conjunction with additional goodness-of-fit indices, including comparative fit index (CFI), nonnormed fit index (NNFI), and root mean square error of approximation (RMSEA). A non-significant χ^2 value represents a good model fit. CFI values of .95 or above and RMSEA values

below 0.06 are also indicators of good model fit (Hu & Bentler, 1999). Using LISREL 8.8, the best-fitting model was used to test the relation between depressive symptoms, posttrauma symptoms and parenting (parental sensitivity and non-hostility) as well as program use (number of home visits completed, number of groups attended, number of secondary activities completed, and duration in program).

Chapter 4: Results

The sample for this dissertation consisted of 371 mothers who completed a measure of traumatic experiences and PTSD symptomatology (PTSD-RI; Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998). Preliminary analyses of trauma exposure include all 371 participants, however the final sample consisted of 283 mothers.

Exclusions and missing data

Among the initial 371 participants, 53 mothers reported no traumatic experiences, 14 refused to complete the symptoms portion of the PTSD-RI, and 21 had missing data or their responses fell three standard deviations below or above the sample mean. Lack of traumatic experiences, refusal to respond, missing data and/or outlying responses on key variables resulted in the exclusion of these participants' data ($n = 88$) from bivariate analyses, confirmatory factor analyses (CFA), and multivariate analyses. The final sample consisted of 283 participants, all of whom experienced at least one traumatic event.

Descriptive Analyses

In the following section I will review descriptive analyses for two subsamples of the evaluation: 1) Demographic data for the final sample of 283 participants; and 2) Trauma exposure and PTSD symptomatology rates for the full sample of 371 participants. I decided to include data on the full sample in order to demonstrate the significant level of trauma exposure among this group of participants. Additional bivariate results are for the sample of 283 traumatized mothers that does not include non-respondents, missing data, and outliers.

Demographic information. Table three details demographic characteristics for the 283 participants who endorsed a traumatic event. One-third of participants reported being high school graduates or receiving their GED. The majority of participants (59.6%) reported being in school, employed, or being both in school and employed. Over half (52%) of the participants also reported being in a committed relationship or married. The majority (61.4%) of mothers lived with their parents or another adult relative/guardian.

Mothers reported that, on average, their baby's father was 21 years of age. Two-thirds of mothers (67.5%) were pregnant at T1, and 12.6% of them reported that this pregnancy was planned. On average mothers reported having been pregnant 1.24 times, with a range of one to four pregnancies.

Mental health indicators showed that on average, mothers reported experiencing 3.36 ($SD = 2.13$) traumatic events. Of mothers with a history of trauma, 21.9% met full criteria for PTSD and 24% met partial criteria, indicating that 45.9% of participants met criteria for at least two symptom clusters of PTSD. Given that DSM-IV criteria for PTSD (three symptoms clusters) are used to diagnose this disorder in clinical settings, it is pertinent to report these data in order to understand the prevalence among adolescent mothers,

Approximately 41% of mothers fell above the clinical cut-off for depression on the CES-D (Radloff, 1977). One quarter of mothers reported receiving mental health services at some point in their lives.

Traumatic events. For the full sample of 371 mothers, descriptive analyses indicated that the majority of participants (85.7%) experienced at least one traumatic event during their lifetime (see Table 5). In fact, almost half of participants (49.1%) reported experiencing at least three traumatic events, indicating a high level of cumulative trauma exposure among this sample of young mothers ($M = 2.93$; $SD = 2.32$). For those mothers who experienced at least one traumatic event ($n = 318$), the overall average of traumatic events experienced increased to 3.36. Witnessing community violence and traumatic loss or injury of a loved one were the most frequently endorsed events (52.6% and 52.3%, respectively) (see Table 6 for the full list of events). Over one quarter of mothers (27.8%) reported witnessing domestic violence, 23.2% reported witnessing community violence, 21.6% reported being in bad accident, and 20.9% reported sexual abuse. Sixty-one participants (19.9%) reported experiencing a traumatic event that could not be categorized into any of the 12 events in the PTSD-RI. Examples of these events include, 1) attempted rape; 2) rape; and 3) witnessing murder.

PTSD. Using DSM-IV criteria for PTSD, 23.8% of the 304 participants who completed the PTSD-RI met full criteria for PTSD, meaning that participants endorsed a traumatic event (Cluster A), considered this event to be a danger to self or another (Cluster A), positively endorsed at least one Reexperiencing symptom (Cluster B), three Avoidance/Numbing symptoms (Cluster C), and two Hyperarousal symptoms (Cluster D) (see Table 7 for full breakdown by symptom cluster). Seventy participants (23.1%) met partial criteria for PTSD, meaning that

participants endorsed Cluster A and met criteria for two symptom clusters (B, C, or D).

Approximately two-thirds (62.5%) of participants met criteria for Reexperiencing symptoms, indicating that a number of mothers reported feeling upset by reminders of their traumatic experiences, experience nightmares, flashbacks, intrusive thoughts, and/or physiological reminders. Over half (56.2%) of mothers met criteria for Hyperarousal symptoms, indicating that participants reported trouble sleeping, irritability, difficulty concentrating, hypervigilance, and/or an exaggerated startle response. Under one-third (30.4%) of participants met criteria for Avoidance/Numbing symptoms, indicating that mothers reported avoiding activities, thoughts, and thinking about their traumatic experiences. Mothers who met criteria for Avoidance/Numbing also reported difficulty remembering aspects of the traumatic experience, loss of interest in activities, emotional distance from loved ones, restricted affect, and a sense of a foreshortened future.

Bivariate Analyses

Demographic characteristics and mental health functioning by program participation. Chi-square and Independent Sample T-tests were performed in order to determine significant statistical differences among participants in the home visiting group (HVS) versus participants in the referrals and information group (RIO) (see Table 3). Overall, no statistically significant differences were found between HVS and RIO for the majority of demographic characteristics and a number of mental health indicators. Results did indicate that

the proportion of mothers who reported planning their pregnancy significantly differed by program participation, HVS (9.0%) versus RIO (3.6%) ($\chi^2(1)=4.166$, $p=.041$). Results also indicated that the proportion of mothers who reported receiving mental health services significantly differed by program participation, HVS (11.3%) ($\chi^2(1)=4.759$, $p=.029$) versus RIO (14.1%).

Demographic characteristics and mental health functioning by PTSD.

Chi-square and one-way Analysis of Variance (ANOVA) were performed in order to determine significant statistical differences among participants who met full DSM-IV criteria for PTSD, partial criteria for PTSD, and those who did not meet criteria for PTSD (see Table 8). Results indicated that there was a statistically significant difference in number of traumatic events reported by level of PTSD ($F(2, 279)=24.762$, $p<.001$). Post-hoc comparisons using the Games-Howell test indicated that mothers who did not meet full or partial criteria for PTSD were more likely to report significantly fewer traumatic events ($M = 2.62$, $SD = 1.6$) than mothers who met full criteria for PTSD ($M = 4.5$; $SD = 2.51$) and partial criteria for PTSD ($M = 4.0$, $SD = 2.16$).

Depression also was found to be significantly related to PTSD.

Participants who were not depressed (64%) were less likely to meet full PTSD criteria compared to those who were depressed (39%). At the same time, those who were depressed were more likely to meet PTSD criteria (34%) compared to those who were not depressed (14%) ($\chi^2(2)=21.425$, $p<.001$). Finally, participants who reported *not* receiving mental health services (61%) were less likely to meet full PTSD criteria compared to those who did report receiving services (35%).

Furthermore, those mothers who did report receiving services were more likely to meet PTSD criteria (38%) than mothers who did not report receiving services (17%) ($\chi^2(2)=17.963, p<.001$).

Parenting and program utilization outcome variables by program participation. Distributions of program utilization for HVS participants were also investigated. Results indicated that, on average, the 157 HVS participants completed 18.45 ($SD = 14.68$) home visits by their second research visit or within their first 12 months of participation. Participants also attended an average of 1.83 ($SD = 3.42$) groups, completed 17 ($SD = 21.31$) secondary activities, and remained in the program for an average of 301.1 ($SD = 120.25$) days.

Independent Sample T-tests were performed in order to determine significant statistical differences among parenting outcomes in the home visiting group (HVS) versus participants in the referrals and information group (RIO) (see Table 4). The only significant difference found between the HVS and RIO groups was for non-hostility during the Emotional Availability free play task. Results indicated that mothers in the HVS group were more likely to engage in more hostile behavior during the free-play interaction than mothers in the RIO group ($t(134)=2.031, p=.044$).

Parenting and program utilization outcome variables by PTSD. One-way Analysis of Variance (ANOVA) were performed in order to determine significant statistical differences among participants who met full DSM-IV criteria for PTSD, partial criteria for PTSD, and those who did not meet criteria for PTSD (see Table 9). No statistically significant differences were found

among PTSD groups (i.e., full PTSD, partial PTSD, no PTSD) and program utilization outcomes. Differences were found for parenting outcomes. Results indicated that there was a statistically significant difference in Emotional Availability sensitivity scores by level of PTSD ($F(2, 133)=4.366, p=.015$). Post-hoc comparisons using the Games-Howell test indicated that mothers who met full criteria for PTSD were more likely to behave less sensitively ($M = 4.13; SD = 1.56$) in their interactions with their children during the free play task than mothers who did not meet criteria for PTSD ($M = 4.93; SD = 1.05$). Findings do indicate that statistically significant differences were found for Emotional Availability non-hostility scores by level of PTSD ($F(2, 133)=3.151, p=.046$), post-hoc comparisons using the Games-Howell test indicate no significant differences between groups.

Intercorrelations among all variables of interest. A number of significant relations were found among mental health functioning, parenting outcome, and program utilization outcome variables.

Posttraumatic stress symptomatology. Intercorrelations among the 17 PTSD symptom items of the PTSD-RI indicate a range of weak to strong relations among variables (see Table 10). Pearson Correlation Coefficients ranged from .062 to .671. Cluster B (Reexperiencing) symptoms (B1 to B5) Pearson Correlation Coefficients ranged from .449 to .671, ranging from moderate to strong relations. Cluster C (Avoidance/Numbing) symptoms (C1 to C7) Pearson Correlation Coefficients ranged from .075 to .621, indicating a range of weak to strong relations. Cluster D (Hyperarousal) symptoms (D1 to D5) Pearson

Correlation Coefficients ranged from .167 to .409, ranging from weak to moderate relations between variables. The weakest relations were found between item C3 (trouble remembering aspects of the traumatic event) and the remaining 16 symptom variables ($r = .062$ to $.272$).

Mental health functioning and outcomes (parenting and program utilization). Intercorrelations among traumatic exposure, depression, and outcome variables indicated expected significant relations (see Table 11). For example, a significant relation was found between number of traumatic events experienced and depression sum score ($r = .236, p < .01$). The positive correlation indicates that mothers who reported experiencing more traumatic events also reported higher depression sum scores.

Significant correlations were found between parenting outcome variables. Pearson Correlation Coefficients ranged from .399 to .672. Emotional Availability Free Play Sensitivity was positively related to Teaching Task Sensitivity ($r = .654, p < .01$), Free Play Non-hostility ($r = .627, p < .01$), and Teaching Task Non-hostility ($r = .399, p < .01$). Teaching Task Sensitivity was positively related to Free Play Non-hostility ($r = .506, p < .01$), and Teaching Task Non-hostility ($r = .672, p < .01$). Free Play Non-hostility was positively related to Teaching Task Non-hostility ($r = .616, p < .01$).

Significant correlations were found between program utilization outcome variables. Pearson Correlation Coefficients ranged from .263 to .789. Findings indicate that the number of completed home visits was positively correlated with number of groups attended ($r = .398, p < .01$), number of completed secondary

activities ($r = .527, p < .01$), and number of days enrolled in program (duration) ($r = .789, p < .01$). Number of groups attended was also found to be positively correlated with number of completed secondary activities ($r = .263, p < .01$) and duration ($r = .270, p < .01$). Finally, duration was positively correlated with number of completed secondary activities ($r = .470, p < .01$). No significant relations were found between mental health functioning and parenting outcomes, mental health functioning and program utilization outcomes, and parenting outcomes and program utilization outcomes.

Posttraumatic stress symptomatology, mental health functioning, and outcomes (parenting and program utilization). Intercorrelations among traumatic exposure, depression, the 17 PTSD symptoms items of the PTSD-RI and outcome variables indicate a number of significant relations (see Table 12). Sixteen of the 17 PTSD symptom variables were positively correlated with the number of traumatic events experienced. In other words, the more traumatic events reported the higher the degree of severity for each symptom variable. The only symptom that was not significantly correlated with number of traumatic events was C3 (difficulty remembering aspects of the traumatic event). Increases in depression sum scores were positively correlated with all 17 PTSD symptoms. As depression scores increased so did the reported degree of severity for each PTSD symptom variable.

A number of significant relations were found between PTSD symptoms and parenting outcomes. For example, Emotional Availability Free Play Sensitivity was negatively correlated with C1 (avoid thinking/talking about event)

($r = -.204, p < .05$) and C4 (loss of interest) ($r = -.239, p < .01$). Teaching Task Sensitivity was negatively correlated with D2 (irritability) ($r = -.182, p < .05$). Free Play Non-hostility was negatively correlated with B2 (nightmares) ($r = -.196, p < .05$), B3 (flashbacks) ($r = -.198, p < .05$), B4 (upset by reminders of traumatic events) ($r = -.184, p < .05$), B5 (physiological reactivity to reminders of traumatic events) ($r = -.288, p < .01$), C1 (avoiding thoughts/talking about events) ($r = -.261, p < .01$), 9 ($r = -.248, p < .01$), C6 (restricted affect) ($r = -.183, p < .05$), C7 (foreshortened future) ($r = -.212, p < .05$), D2 (irritability) ($r = -.207, p < .05$). Teaching Task Non-hostility was positively correlated with C3 (difficulty remembering aspects of event) ($r = .221, p < .05$) and negatively correlated with D2 (irritability) ($r = -.189, p < .5$).

Number of completed secondary activities was significantly correlated with the following PTSD symptoms: B4 (upset by reminders of event) ($r = -.189, p < .05$), C2 (avoiding activities that remind participant of event) ($r = -.218, p < .05$), D1 (trouble sleeping) ($r = -.189, p < .05$), and D2 (irritability) ($r = -.199, p < .05$). As these symptoms increased, the number of completed secondary activities decreased. No significant correlations were found between PTSD symptom variables and number of completed home visits, number of groups attended, and duration.

Confirmatory Factor Analyses

The literature indicates that the current three factor structure of PTSD proposed in the DSM-IV may not adequately represent the post trauma experience of individuals. A number of alternate models have been proposed and validated

(Elhai, 2011; King, 1998; Simms, 2002). Based on the literature review for this dissertation, four models were tested (see Table 2): 1) the three-factor model of reexperiencing, avoidance/numbing, and hyperarousal proposed in the DSM-IV (APA, 1994) shown in Figure 1 (pg. 107); 2) the four-factor numbing model proposed by King et al. (1998) shown in Figure 2 (pg. 108); 3) the four-factor dysphoria model proposed by Simms et al. (2002) shown in Figure 3 (pg. 109); and 4) the five-factor dysphoric arousal model proposed by Elhai et al. (2011) shown in Figure 4 (pg. 110).

Figure 1

Conceptual Diagram of the Three Factor DSM-IV Model (APA, 1994)

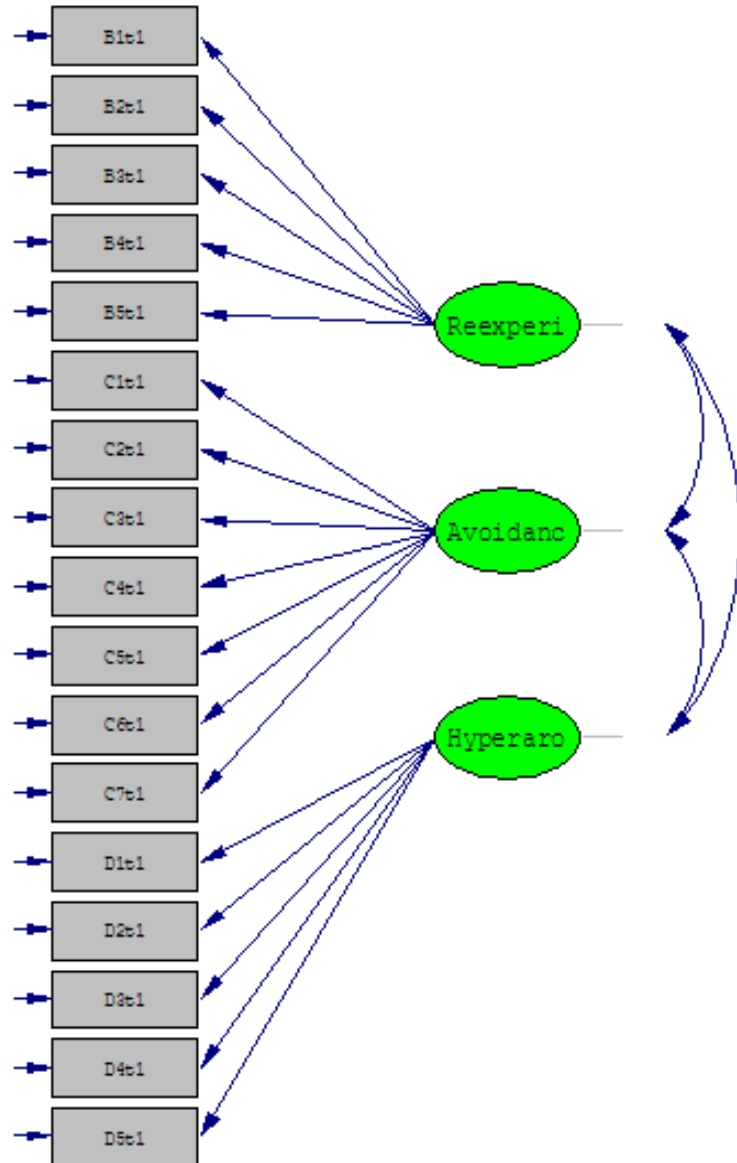


Figure 2

Conceptual Diagram of the Four Factor Numbing Model (King et al., 1998)

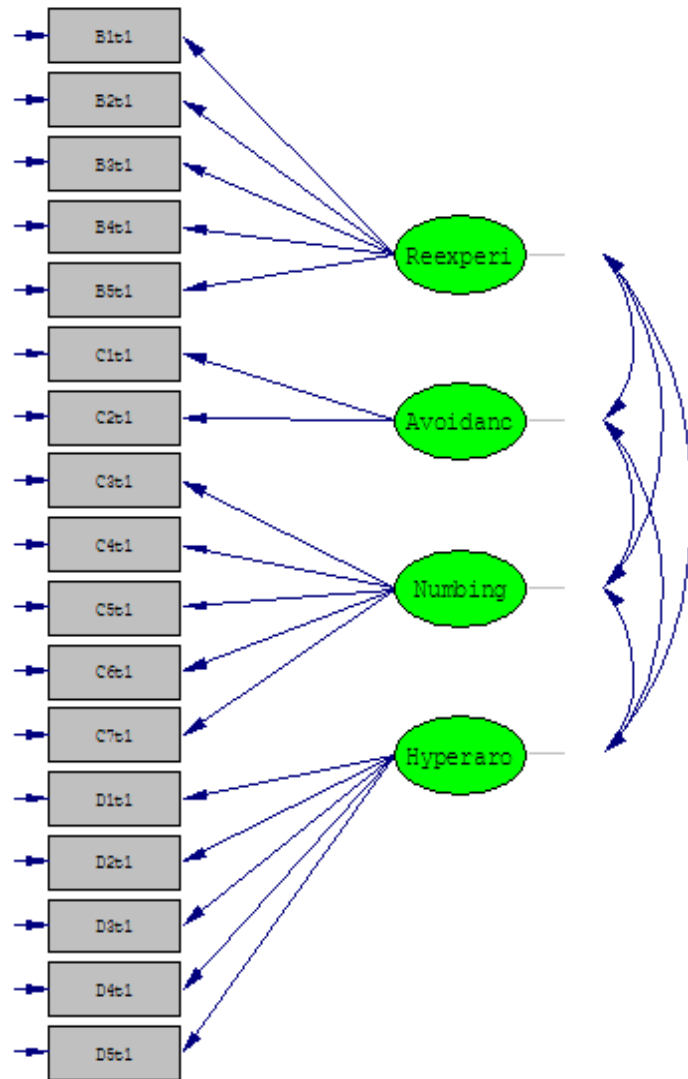


Figure 3

Conceptual Diagram of the Four Factor Dysphoria Model (Simms et al., 2002)

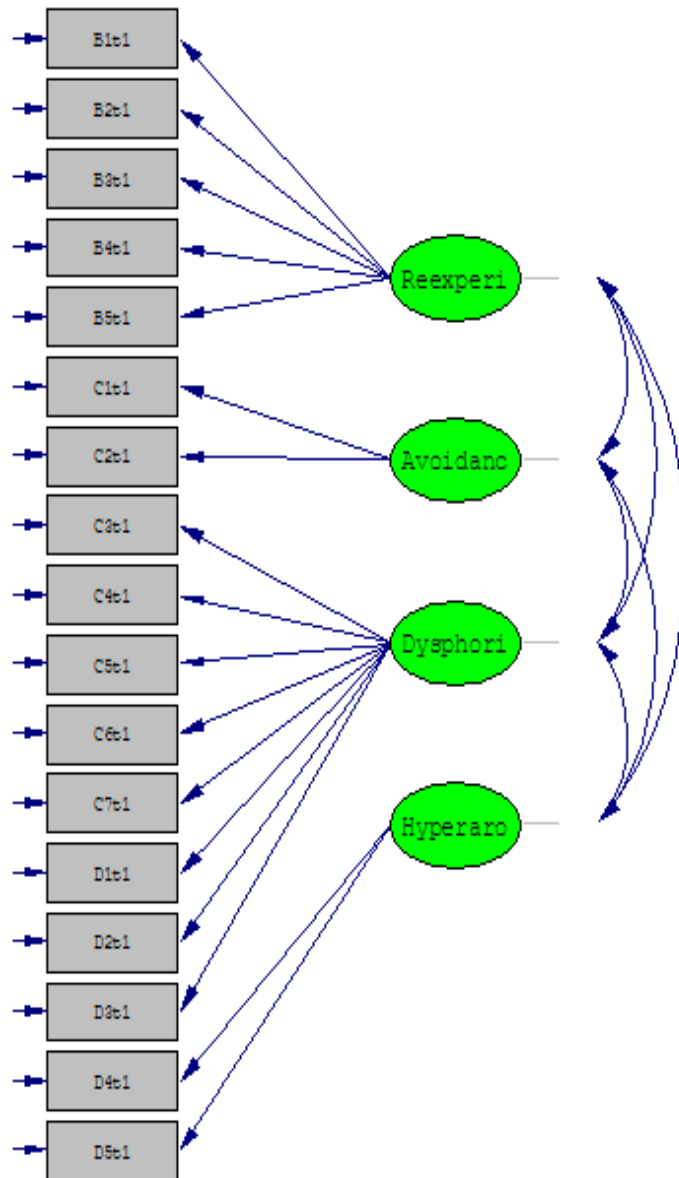
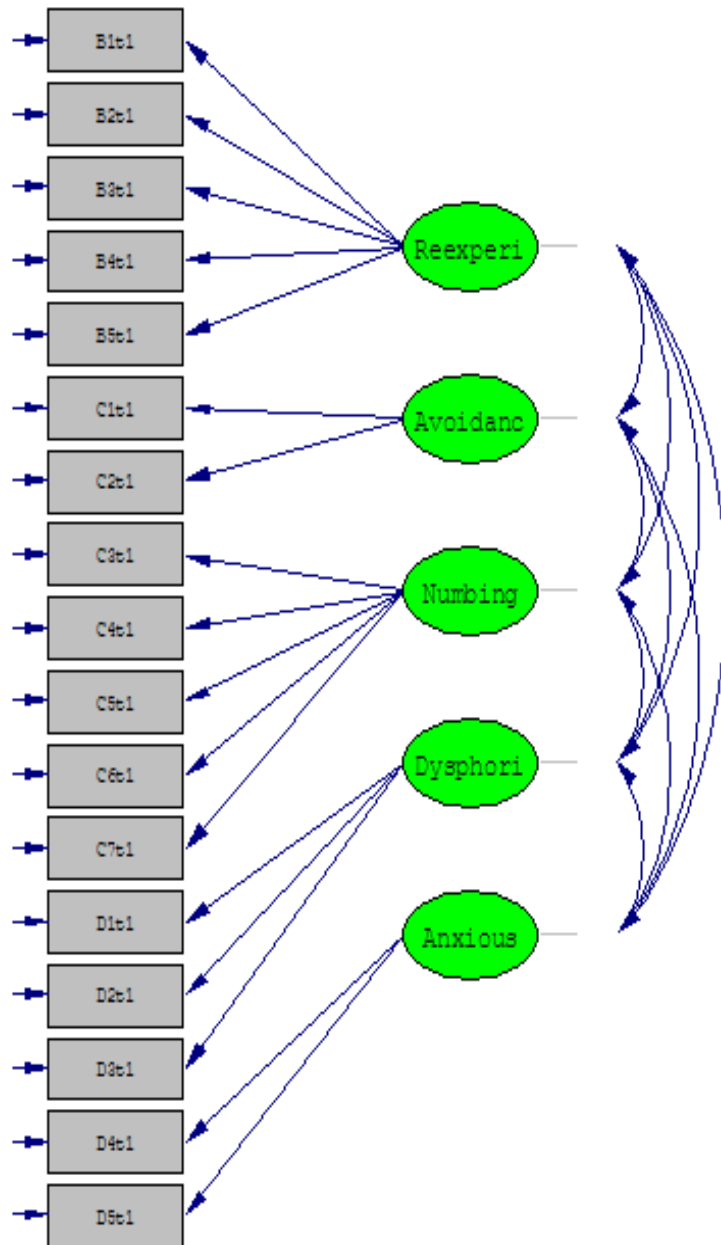


Figure 4

Conceptual Diagram of the Five Factor Dysphoric Arousal Model (Elhai et al., 2011)



The indicators were the 17 items from the PTSD-RI (Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998) and were measured using a five-point Likert scale (0 to 4). Indicators were treated as interval-level (Likert scale with five or more points) and higher scores reflected higher levels of PTSD symptomatology. Variances of each factor were fixed to 1.00. The measurement model contained no double-loading indicators and all measurement error was presumed to be uncorrelated. Covariances between all factors in all models were allowed to be freely estimated.

The sample variance-covariance matrix was analyzed using LISREL 8.80, and a maximum likelihood minimization function was used (see Table 10 for intercorrelations and Table 13 for means and standard deviations). Goodness-of-fit was evaluated using chi-square, root mean square error of approximation (RMSEA) and its 90% confidence interval (90% CI), nonnormed fit index (NNFI), and comparative fit index (CFI). Model fit guidelines provided by Hu and Bentler (1999) were used to determine fit ($RMSEA \leq .06$; 90 % CI $\leq .06$; $NNFI \geq .95$; and $CFI \geq .95$) (see Table 14 for a summary of fit statistics).

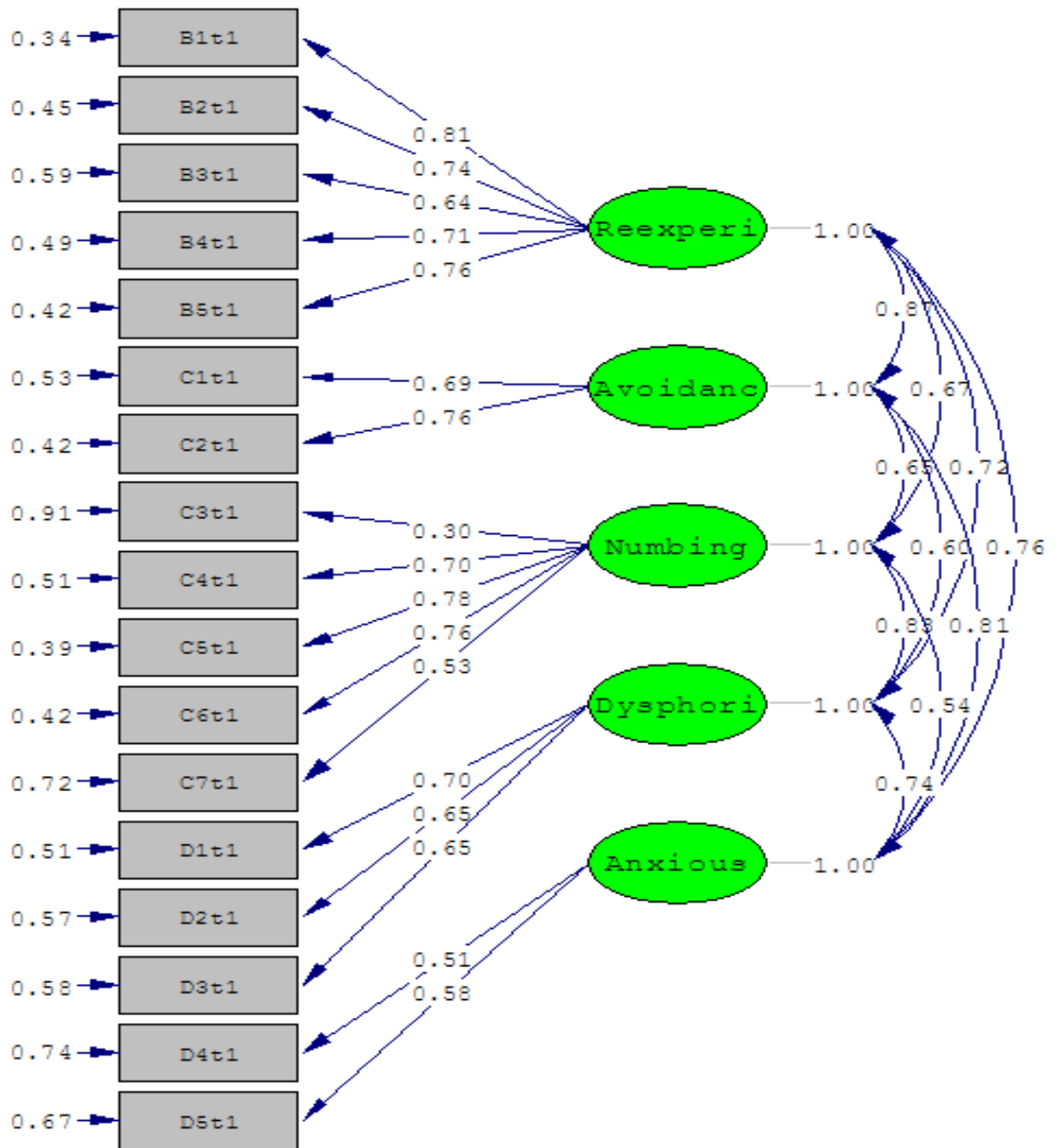
Analyses revealed that the three factor model proposed in the DSM-IV (APA, 1994) was the least supported model ($\chi^2(116) = 362.39$, $p < .001$, $RMSEA = 0.093$ [90% CI = 0.083 to 0.10], $NNFI = 0.94$; $CFI = 0.95$) and provided poor fit based on Hu and Bentler's (1999) recommended guidelines. Both the Numbing model ($\chi^2(113) = 274.02$, $p < .001$, $RMSEA = 0.073$ [90% CI = 0.062 to 0.084], $NNFI = 0.96$; $CFI = 0.97$) and the Dysphoria model ($\chi^2(113) = 274.45$, $p < .001$, $RMSEA = 0.073$ [90% CI = 0.062 to 0.083], $NNFI = 0.96$; $CFI = 0.97$)

provided adequate fit as per Hu and Bentler's (1999) guidelines. NNFI and CFI values above 0.95 for both of these models suggest a better fit than hypothesizing no relations among indicators. However, the lower bounds of the 90% CI for both models indicate that the close-fit hypothesis is rejected since they fall above the .06 cut off.

Finally, the Dysphoric Arousal model also provided adequate fit ($\chi^2(109) = 243.08$, $p < .001$, $RMSEA = 0.066$ [90% CI = 0.055 to 0.077], $NNFI = 0.97$; $CFI = 0.97$). $NNFI$ and CFI values equaling 0.97 indicate that this model provides a 97% better fit than a model where no relations among indicators are tested. Although the lower bound of the 90% CI falls below the 0.06 threshold, with a $RMSEA$ greater than .05, the p -value for the test of close fit is significant therefore we can reject the null hypothesis that $\epsilon_0 \leq .05$. Fit statistics for the Dysphoric Arousal model suggest a better fit than the alternative three models (i.e., DSM-IV, Numbing, and Dysphoria). Factor loading estimates revealed that the indicators were moderately to strongly related with their assigned factor loading (range of $R^2 = 0.09 - 0.66$). The lowest value was for the C3 indicator (difficulty remembering aspects of the trauma), bivariate analyses have shown that this indicator is not statistically related to a number of variables. Estimates from the five-factor Dysphoric Arousal solution (see Table 15) indicate a strong relation among all five factors.

Figure 5

Completely Standardized Solution for the Five Factor Dysphoric Arousal Model of Posttraumatic Stress Symptoms



Multivariate Analyses

CFA indicated that the Dysphoric Arousal provided the best fit to the data. Furthermore, this model was validated among a sample of participants whose trauma histories (e.g., mothers in a domestic violence shelter with extensive histories of trauma) most resemble the sample used in this dissertation (Elhai et al., 2011). Structural equation modeling was not successful given the limited sample sizes for outcome data ($N = 135$ for parenting outcomes) therefore mean scores for the five factors of the Dysphoric Arousal model were computed and used to investigate the relation between posttraumatic symptomatology and parenting outcomes, as well as program outcomes (see Table 16 for the means, ranges, and standard deviations for these five factors). An independent samples *t*-test indicated that there were no statistically significant differences between HVS and RIO in any of the factor scores (see Table 16).

A set of nested multiple linear regression models were fit in order to test the relation between mental health functioning and parenting. Finally, posttraumatic stress symptom factors were tested as mediators between depression and parenting outcomes.

Parental sensitivity. Nested taxonomies of the regression models that describe the relation between parental sensitivity (as measured during the Emotional Availability free play task and the teaching task) and a number of predictor variables, demonstrated no significant relations between program participation, number of traumatic events experienced, receipt of mental health

services, depression, and any of the five posttraumatic stress symptom factor mean scores of the dysphoric arousal model (see Tables 17 and 18).

Mediation and parental sensitivity. Baron and Kenny (1986) guidelines for a single mediator model identify a series of four causal steps: 1) the independent variable must affect the dependent variable; 2) the independent variable must affect the mediator; 3) the mediator must affect the dependent variable when the independent variable is controlled for; and 4) the direct effect must not be significant. Using these guidelines, the data indicated no mediation. Depression, the independent variable was not significantly related to sensitivity (free play or teaching task). A significant relation did exist between one of the hypothesized mediators (numbing) and free play sensitivity ($B = -.260, p = .009$). Furthermore, analyses indicated a significant relation between the predictor variable (depression) and the proposed mediator (numbing) ($B = .498, p < .001$). Although significant relations were found between the mean factor score of numbing and depression, as well as free play sensitivity, mediation could not be tested given the violation of the first step of Baron and Kenny's (1986) guidelines: the independent variable (depression) must affect the dependent variable (sensitivity).

Parental non-hostility. Nested taxonomies of the regression models that describe the relation between parental non-hostility (as measured during the Emotional Availability free play task) and a number of predictor variables, indicated a number of significant relations between program participation, number of traumatic events experienced, receiving mental health services, depression, and

any of the five posttraumatic stress symptom factors of the dysphoric arousal model (see Table 19). On their own (Model 1), program participation (HVS vs. RIO) and various mental health functioning indicators (i.e., number of traumatic events experienced, receiving mental health services, and depression) were not significant predictors of mothers' free play non-hostility scores. Model two indicated that once reexperiencing symptoms were entered, both program participation and reexperiencing symptoms significantly predicted mothers' non-hostility scores. Introducing avoidance symptoms into the model (Model 3) resulted in an insignificant relation between program participation and free-play non-hostility. However, the change in R^2 was not significant suggesting that Model three did not provide a better overall fit than Model two.

Introducing numbing into the model (Model 4) resulted in a significant overall model ($F(7,128) = 3.297, p=.003, R^2=.153$) with a significant change in R^2 ($\Delta R^2 = .032, F(1,128) = 4.906, p = .029$). The overall R^2 indicated that 15.3% of the variance in maternal non-hostility during free play is accounted for by this model. This finding suggests that other factors may better account for fluctuations in maternal scores of non-hostility. In terms of specific indicators, the model specified that, when controlling for all other variables, program participation, depression, and numbing were all significant predictors of maternal non-hostility scores. These results indicated that, for this group of mothers, enrollment in the program signified a drop of approximately 0.30 points in maternal non-hostility during the free play task. In other words, during interactions with their children mothers in HVS appeared more hostile than

mothers in RIO. In terms of depression, each point increase in depression scores revealed a .017 increase in non-hostility scores. Lastly, increases in numbing symptoms indicated a 0.35 decrease in non-hostility scores.

Although Models five and six are significant, change in the R^2 statistic is not, indicating that these two models did not provide an improved overall fit when compared to Model four. Parental non-hostility during the teaching task was not predicted by any of the variables of interest (see Table 20).

Mediation and parental non-hostility. Using Baron and Kenny's (1986) guidelines for a single mediator model, the data indicated no mediation. There were no significant statistical relations between depression and non-hostility (free play or teaching task). However, significant relations did exist between a number of the hypothesized mediators and free play non-hostility (Reexperiencing $B = -.296$, $p = .001$; Avoidance $B = -.186$, $p = .038$; Numbing $B = -.344$, $p < .001$). Furthermore, analyses indicated a significant relation between the predictor variable (depression) and the hypothesized mediators (Reexperiencing $B = .319$, $p < .001$; Avoidance $B = .297$, $p < .001$; Numbing $B = .498$, $p < .001$). Although significant relations were found between the mean factor scores of reexperiencing, avoidance, and numbing and depression, as well as free play non-hostility, mediation could not be tested given the violation of the first step of Baron and Kenny's (1986) guidelines: the independent variable (depression) must affect the dependent variable (non-hostility).

Program Utilization. Given our limited understanding of program use among traumatized adolescent mothers receiving home visiting services, the goal

of these analyses was to describe the relation between program use variables and factors scores for posttraumatic stress symptomatology (See Table 21).

Significant relations were only found for one of the four program use variables (completed home visits, groups attended, completed secondary activities, and duration). Completed secondary activities were significantly correlated the avoidance ($r = -.211, p = <.05$) and dysphoric arousal factors ($r = -.199, p = <.05$). As the scores for the numbing and dysphoric arousal factors increased, the number of completed secondary activities decreased.

Summary of Findings

In sum, descriptive analyses indicated that mothers in this study had significant trauma exposure throughout their young lives. Furthermore, the findings point out that traumatic experiences were quite variable and that exposure to community violence, as well as traumatic injury/loss were rather common among these mothers. Findings also indicated that PTSD is as prevalent among this group as it is among any other high-risk population.

Bivariate analyses indicated that participants who met the clinical cut-off for depression were also more likely to meet full PTSD criteria than those mothers who were not depressed. Furthermore, participants who reported receiving mental health services at some point in their lives were more likely to meet full PTSD criteria than those mothers who never received services.

Although bivariate analyses indicated that mothers who met full criteria for PTSD were more likely to behave less sensitively in interactions with their infants -

these findings were no longer significant in multivariate analyses using factors of posttraumatic stress symptomatology.

The most robust findings were for parental non-hostility during the Emotional Availability free play task. Regression analyses indicated that program participation and increases in numbing symptoms predicted increases in hostile behavior. Conversely, increases in depression predicted decreases in hostile behavior.

Confirmatory factor analyses revealed that the DSM-IV three factor model for PTSD was not supported among this population of traumatized young mothers. This finding is in line with a vast array of studies conducted among a variety of groups. Goodness-of-fit indices pointed to adequate fit of the data for three empirically supported models, however the five-factor dysphoric arousal model (Elhai et al., 2011) provided the best fit to the data. Given the limited sample size for outcome data, Structural Equation modeling was not successful therefore five posttraumatic stress symptom factor mean scores were used in further analyses.

As already noted, multivariate analyses indicated a significant relation between reexperiencing and avoidance symptoms in predicting maternal non-hostility during free-play interactions. Initial steps in mediation analyses indicated no significant relations between the predictor variable (depression) and any of the parenting outcomes (sensitivity and non-hostility). However, a significant relation was found between depression and posttraumatic symptom factor mean scores (i.e., reexperience, avoidance, and numbing). These factor

mean scores were also significantly related to parenting outcomes (i.e., sensitivity and non-hostility). Finally, posttraumatic symptom factor mean scores were related to only one program utilization variable: completed secondary activities.

Chapter 5: Discussion

The literature clearly indicates that many adolescent mothers are confronted with a multitude of adversities before, during, and after pregnancy. Although many of these adversities (i.e., poverty, lack of education) have been the focus of researchers' attention over the past two decades, particular focus on the impact of traumatic events on the psychological and parental functioning of adolescent mothers has been lacking. Studies do indicate that specific traumatic events, such as child maltreatment and victimization due to intimate partner violence (IPV), are linked to adverse parenting. However, the majority of studies only collect information on histories of child maltreatment or IPV, ignoring the possibility of exposure to other traumatic events and the potential adverse impact cumulative trauma may have on mental health functioning, as well as parental functioning. Finally, we know that trauma may result in Posttraumatic Stress Disorder (PTSD); however, we do not have a clear understanding of either the prevalence of PTSD among adolescent mothers nor do we understand the impact of PTSD on parental functioning among this population.

The overall goal of this dissertation was to provide insight into the prevalence of traumatic experiences and the impact of these experiences on the psychological and parental functioning among a sample of adolescent mothers participating in a statewide evaluation of Massachusetts Healthy Families, a home visiting program. Moreover, this dissertation aimed to examine the impact of posttraumatic stress symptoms on program utilization. Given the significant rates of depression among adolescent mothers cited in the literature, this dissertation

also set forth to investigate the potential link between depression, posttraumatic stress symptoms, and parenting outcomes.

For this dissertation I had five primary aims: 1) explore the rates of trauma exposure and the types of trauma exposure adolescent mothers have experienced; 2) explore the prevalence of PTSD symptomatology among these adolescent mothers; 3) test the fit of alternate factor models of the posttraumatic stress construct that have been substantiated among adult and adolescent populations but never among adolescent mothers; 4) explore the impact of depression on parenting behavior among adolescent mothers, as mediated by posttraumatic stress symptoms; and 5) explore the relation between factors of posttraumatic stress symptomatology and program utilization.

Aim 1: Rates of trauma exposure and trauma types

I hypothesized that mothers in this sample would have high rates of trauma exposure, similar to other high-risk populations found in the literature. Results indicated that almost all of the 371 participants (85.7%) had a history of trauma exposure. In fact, participants reported experiencing approximately three traumatic events over their young lifetimes. Furthermore, almost a quarter of the participants reported experiencing five or more traumatic events. These rates of exposure are similar to those found by Kennedy and Bennett (2006), who reported rates of trauma exposure among a sample of adolescent mothers that ranged from 59% to 98%; they also noted that 75% of their participants reported exposure to three to four traumatic events.

I further hypothesized that mothers would report exposure to a greater variety of traumatic events than the two events commonly found in the literature (i.e., child maltreatment and IPV). In addition, I hypothesized that mothers would report high rates of exposure to community violence, witnessing community violence, and witnessing domestic/family violence, with rates similar to other high-risk populations. Mothers in this study reported high rates of exposure to a variety of traumatic events. Over half the participants with a history of trauma exposure reported witnessing community violence and traumatic injury/loss of a loved one. Well over one quarter of participants reported witnessing domestic violence in their homes and almost 25% reported being the victim of community violence. Approximately 20% of participants reported being victims of childhood physical abuse and/or childhood sexual abuse. Similar to trauma exposure studies among nulliparous adolescents in high-risk contexts, these findings indicate that young mothers are exposed to a variety of events that may adversely affect their ability to function (Buka, Stichick, Birdthistle, & Earls, 2001; Macy, Barry, & Noam, 2003).

These findings have a number of implications. For one, they indicate that these young mothers not only are confronted with adversities that may challenge their child-rearing abilities, but they are also exposed to a number of life-threatening events that may result in traumatic loss for their children. Furthermore, the literature points to the fact these mothers may engage in high-risk behaviors that may increase their exposure to trauma. In fact, studies found that traumatized youth, whether parenting or not, engaged in more high-risk

behaviors than non-traumatized youth and that adolescent parents reported the highest rates of involvement in high-risk behaviors (Adams & East, 1999; Barnett, Liu, & DeVoe, 2008; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Koniak-Griffin & Lesser, 1996; Lansford et al., 2007; Lesser, Koniak-Griffin, Gonzalez-Figueroa, Huang, & Cumberland, 2007; Martin, Clark, Lynch, Kupper, & Cilenti, 1999; Mylant & Mann, 2008; Rickert, Wiemann, Harrykissoo, Berenson, & Kolb, 2002). For example in a large study of adolescent mothers, participants with a history of physical and/or sexual violence were more likely to report using tobacco, alcohol, or illicit drugs than mothers with no history of trauma (Martin, Clark, Lynch, Kupper, & Cilenti, 1999). Adolescent parents were also found to engage in more drug use and assaultive behavior than nulliparous adolescents (Herrenkohl, Herrenkohl, Egolf, & Russo, 1998).

Findings on health-risk behaviors among traumatized youth indicate that adolescents with a history of trauma are more likely to become parents and are also more likely to engage in behaviors that may put them and their children at risk for experiencing future traumatic events. There is a clear indication that adolescent mothers are at a greater risk for engaging in high-risk behaviors, especially if these mothers have histories of trauma. Findings from this dissertation indicate that the majority of mothers who sought out home visiting services, whether they received services or not, reported extensive trauma histories. Given what we know, it seems pertinent to have home visiting programs address mothers' ongoing engagement in high-risk behaviors in order to determine children's safety. The Massachusetts Healthy Families program

currently assesses for a number of high-risk behaviors (i.e., suicidal ideation, and alcohol and drug use), however, it is unclear whether or not this is a standard procedure for Healthy Families programs across the United States or other models of home visiting.

Exposure to traumatic events is also associated with a number of adverse psychological outcomes. For example, the literature indicates that traumatized adolescents, whether parenting or not, report more suicidal ideation than non-traumatized youth (Adams & East, 1999; Koniak-Griffin & Lesser, 1996; Sarri & Phillips, 2004). Koniak-Griffin and Lesser (1996) found that abused parents were seven times more likely to attempt suicide than parents with no history of abuse. In a sample of highly traumatized adolescent parents, Sarri and Phillips (2004) also found that more than one quarter of the participants in their study reported suicidal ideation. Research also indicates that the added pressure of birthing and parenting multiple children within a limited time span may increase the risk of suicidality for traumatized adolescent mothers (Patchen & Caruso, 2009). Overall, a number of studies indicate that trauma is a significant risk factor for suicidal ideation. Parental suicide has been associated with profound effects over a child's lifetime, including mental illness and suicidal ideation (Kuramoto, Brent, & Wilcox, 2009; Tsuchiya, Agerbo, & Mortensen, 2005; Wilcox, Kuramoto, Lichtenstein, Langstrom, Brent, & Runeson, 2010).

These findings indicate that the Complex PTSD framework may be appropriately applied to this population given the high rates of cumulative trauma experienced by these young mothers (Ford & Courtois, 2009; Herman, 1992;

1997). By recognizing the complexity of these young mothers' trauma histories, more suitable services may be provided. For example, adolescent mothers may receive mental health services that are specifically aimed at addressing the psychological symptoms directly associated with their traumatic experiences, including suicidal ideation.

Moreover, these findings stress the importance of proper trauma assessment by intervention programs working with adolescent mothers in order to ensure both the safety of the mother and her child. This inquiry is crucial given that for a number of mothers the trauma is ongoing. Findings clearly indicate that risk for traumatic exposure exists not only in a mother's home environment but also in her community. Home visitors are in a particularly important position since they are often times the first to provide ongoing services to adolescent mothers. Home visitors are gatekeepers who can educate and encourage mothers to participate in supportive services in their communities, including mental health treatment. However, home visiting programs need to provide the proper training and clinical support for compulsory trauma assessment to their service providers, whether home visitors are professionals or paraprofessionals. Similar to assessing high-risk behaviors, it is unclear, whether home visiting programs have a standardized procedure for assessing parents' trauma histories.

Aim 2: PTSD prevalence

Due to the lack of information available regarding PTSD among adolescent mothers, a primary goal for this dissertation was to explore the prevalence of the disorder in this sample of mothers. I hypothesized that the

percentage of mothers who met full criteria for PTSD would be similar to other high-risk populations. I also hypothesized that the percentage of mothers meeting each of the three diagnostic criteria would be greater than the percentage who met full criteria for PTSD, warranting the need to explore if and how clusters of symptoms affect functioning.

The initial hypothesis that the percentage of mothers who met full criteria for PTSD would be similar to rates found in other high-risk populations was supported. Almost one-quarter (23.8%) of mothers met full criteria for PTSD. Data from the National Comorbidity Survey indicate that approximately 3.5% of American adults (ages 18 and older) have PTSD in a given year (Kessler, Chiu, Demmlers, & Walters, 2005). However, adolescents appear to suffer from a higher rate of PTSD than adults (6-10%) (Giaconia, et al., 1995; Kessler, Chiu, Demmlers, & Walters, 2005). Moreover, prevalence of PTSD is higher among higher risk populations (Buka, Stichick, Birdthistle, & Earls, 2001; Cauffman, Feldman, Waterman, & Steiner, 1998; Dixon, Howie, & Starling, 2005; Horowitz, Weine, & Jekel, 1995). For example, in a study of 100 female incarcerated juvenile offenders, Dixon, Howie, and Starling (2005) found that 37% of participants met full criteria for PTSD. Findings from this dissertation suggest that the prevalence of PTSD among adolescent mothers is higher when compared to the general population of adults in the United States and is similar when compared to other high-risk groups, including adults and adolescents. Furthermore, findings suggest that future studies conducted among populations of adolescent mothers should seriously consider including an assessment of PTSD.

Parental and child outcomes associated with trauma histories and/or depression may be better explained by PTSD symptoms or the comorbidity of PTSD with depression.

The second hypothesis that the percentage of mothers meeting each of the three diagnostic criteria would be greater than the percentage who met full criteria for PTSD was also supported. Findings indicate that well over half of mothers with a history of trauma met two of the three symptom criteria for PTSD. These two criteria were the reexperiencing cluster (B) (i.e., feeling like the event is happening again, intrusive memories or dreams about the event), and the hyperarousal cluster (D) (i.e., difficulty sleeping, irritability, angry outbursts). Less than one third of mothers met criteria for the avoidance/numbing cluster (i.e., avoiding thoughts, conversation, and/or activities related to the traumatic event; difficulty remembering; and restricted affect). Furthermore these findings indicate that 23.1% of mothers met partial criteria for PTSD, meaning that approximately half (46.9%) of mothers met either full or partial criteria for PTSD. These findings suggest the need to investigate whether particular clusters of symptoms have differential effects on mothers' overall functioning, particularly as they relate to parenting. For example, Scheeringa and Zeanah (2001) proposed that parents who are experiencing avoidance and withdrawal symptoms (Cluster C of PTSD) may be unable to correctly interpret their children's behavioral cues and may not respond sensitively to these cues.

These findings have a number of clinical implications, particularly for prevention and intervention programs. For one, they point to the need for

programs to assess participants' trauma histories as well as mental health functioning above and beyond symptoms of depression. Home visiting programs are in a particularly advantageous position for connecting participants with an array of services, including mental health treatment. Second, given the proper support and training, home visitors can also provide psycho-education for a number of mothers who are yet unwilling to seek out more formalized mental health treatment. Whether paraprofessional or professional, trainings around the effects of trauma exposure on psychological functioning, including PTSD, will aid home visitors in making the link between past trauma exposure and adverse functioning. Furthermore, this knowledge could be disseminated to young mothers by home visitors, and would aid these mothers in becoming better parents. The literature indicates that, at present, no home visiting programs regularly inquire about PTSD symptoms.

Aim 3: The fit of alternate models of the posttrauma construct

Much debate exists about the current factor structure of the PTSD diagnosis detailed in the DSM-IV-TR (APA, 2001). Many studies have found that the existing three factor structure of PTSD (i.e., reexperiencing, avoidance/numbing, and hyperarousal) does not represent the data well. Due to these findings, a number of alternate factor structures have been proposed and substantiated among diverse populations of adults and adolescents. However, no study to date has validated any of these proposed factor structures of posttraumatic stress symptoms among adolescent mothers. Given this gap in the literature I conducted a confirmatory factor analysis and hypothesized that the

three factor PTSD model currently detailed in the DSM-IV-TR (APA, 2001) and used as a standard for diagnosis, would not provide an acceptable fit to the data. Since there are no studies examining alternate factor structures of posttraumatic stress symptoms among adolescent mothers, an exploratory analysis was conducted in order to determine which of the three empirically validated models (i.e., numbing model, dysphoria model, dysphoric arousal model) fit the data best.

The first confirmatory factor analysis indicated that the three factor model of PTSD did not fit the data well. In short, the 17 symptom items of the PTSD-RI did not map on satisfactorily to the three factors of reexperiencing, avoidance/numbing, and hyperarousal. This finding is in line with a number of studies that indicate that the DSM-IV criteria for PTSD do not fully capture the posttrauma experience of many individuals (Asmundson et al., 2000; Elhai et al., 2011; King, Leskin, King, & Weathers, 1998; Simms, Watson, & Doeblinger, 2002).

The numbing model of posttraumatic stress symptoms proposed by King et al (1998) suggests that the second factor of the DSM-IV model of PTSD (Cluster C: avoidance/numbing) should actually be split into two factors: 1) avoidance and 2) numbing. King et al (1998) suggest that this four factor model better represents the qualitative differences between avoidance and numbing symptoms. In short, avoidance symptoms can be interpreted as a more conscious or effortful process of preventing a triggering of emotions in response to reminders of the traumatic event, whereas numbing symptoms may be a more

subconscious reaction to a traumatic event. Results of the confirmatory factor analysis indicated that this model provided an adequate fit to the data.

The dysphoria model proposed by Simms et al. (2002) suggests that posttraumatic stress symptoms are better represented by a four factor model that consists of the following symptom clusters: 1) Reexperiencing; 2) Avoidance; 3) Dysphoria; and 4) Hyperarousal. The difference between the numbing model (King et al., 1998) and the dysphoria model is that the numbing cluster and three of the hyperarousal symptoms are collapsed into one cluster called *dysphoria*. Simms et al. (2002) propose that eight symptoms that load on to the dysphoria factor actually represent a nonspecific factor of general distress that is captured by a number of other anxiety disorders and mood disorders. Due to the possibility of shared variance between the dysphoria factor and a number of anxiety and depression symptoms, this factor may help begin to explain the high levels of comorbidity between PTSD and other mental health disorders, such as depression and other anxiety disorders. Similar to the numbing model, results of the confirmatory factor analysis indicated that this model provided an adequate fit to the data.

Finally, the dysphoric arousal model proposed by Elhai et al. (2011) suggests that a five factor model is a better representation of posttraumatic stress symptoms than any of the previous models. The five factors are: 1) Reexperiencing; 2) Avoidance; 3) Numbing; 4) Dysphoric Arousal; and 5) Anxious Arousal. Similar to Simms et al. (2002), Elhai et al. (2011) proposed that there are a number of symptoms in the PTSD criteria that share common

variance with symptoms of other mood and anxiety disorders. Unlike King et al. (1998) and Simms et al. (2002), Elhai et al. (2011) suggested that symptoms of the dysphoric arousal factor (i.e., difficulty sleeping, irritability/anger, difficulty concentrating) may not be adequately captured by the anxiety-related hyperarousal factor of the numbing model or the depression-related dysphoria factor of the dysphoria model. In fact, Elhai et al. (2011) believe that the dysphoric arousal factor may represent a hybrid of depression and anxiety (i.e., general distress), whereas their proposed fifth factor of anxious arousal is more characteristic of fear-based anxiety (i.e., hypervigilance and an exaggerated startle response) not commonly associated with general distress. Similar to both the numbing model and the dysphoria model, results of the confirmatory factor analysis indicated that this model provided an adequate fit to the data.

Overall, all three alternate models of posttraumatic stress symptomatology provided an adequate fit and the standard three factor model of PTSD did not adequately capture the structure of posttraumatic stress symptomatology among adolescent mothers in this study. Of the three models, the dysphoric arousal model provided the best fit and has found support among populations that most resemble the characteristics of participants in this dissertation (Elhai, 2011). Although the three factor model of PTSD proposed in the DSM-IV-TR (APA, 2001) continues to be the diagnostic standard used in clinical settings, findings from both existing literature and this dissertation clearly indicate that alternate factor models provide a better framework for understanding the underlying constructs of posttraumatic stress symptomatology. This was the first known

study to investigate the factor structure of posttraumatic stress symptomatology among a group of adolescent mothers.

Aim 4: The link between depression, posttraumatic stress symptom factors, and parenting

Findings clearly indicated that mothers in this study reported significant rates of trauma exposure and a number of mothers suffered from full or partial PTSD as measured by the PTSD-RI using DSM-IV criteria. Bivariate analyses indicated that mothers who met full criteria for PTSD displayed less sensitivity and more hostility during free play interactions with their children than mothers who did not meet full criteria for PTSD. Because confirmatory factor analyses indicated that the three-factor structure for PTSD described in the DSM-IV did not provide an adequate fit to the data, the five factor mean scores for the dysphoric arousal model were used to investigate the relations between posttraumatic stress symptomatology and parenting outcomes. More specifically, the goal of this dissertation was to investigate whether and how specific symptom factors were related to particular parenting behaviors.

The literature has indicated a link between maternal depression and suboptimal parenting outcomes, more specifically decreased emotional availability (Driscoll & Easterbrooks, 2007; Easterbrooks & Biringen, 2009). Furthermore, bivariate analyses indicated that mothers who met the clinical cut-off for depression were more likely to meet criteria for full PTSD than mothers who did not meet the clinical cut-off for depression. Given these findings, and minimal understanding as to the link between posttraumatic stress

symptomatology and emotional availability, analyses were conducted to test the mediated relation between depression, posttraumatic stress symptoms and parenting outcomes.

The following four hypotheses were investigated in this dissertation: 1) Increases in specific factors of posttraumatic stress symptomatology (i.e., reexperiencing, avoidance, numbing, dysphoric arousal, anxious arousal) would predict lower parental sensitivity in a free play task and a teaching task); 2) Given high rates of comorbidity among trauma survivors, I predicted that the relation between depression and parental sensitivity would be mediated by specific factors of posttraumatic stress symptoms; 3) Increases in specific factors of posttraumatic stress symptomatology (i.e., reexperiencing, avoidance, numbing, dysphoric arousal, anxious arousal) would predict lower parental non-hostility in a free play task and a teaching task); 4) Given high rates of comorbidity among trauma survivors, I predicted that the relation between depression and parental non-hostility would be mediated by specific factors of posttraumatic stress symptoms. Specific factors were not identified because these were dependent on what proposed models of posttraumatic stress symptoms would provide the best fit to the data.

Predicting parental sensitivity. No significant relations between program participation, mental health functioning and use (i.e., number of traumatic events, depression, seeking out mental health services), factors of posttraumatic stress symptoms, and parental sensitivity during either the free play task or the teaching task were found. Although bivariate analyses using the DSM-

IV criteria for PTSD indicated that participants who met full criteria for PTSD were more likely to receive lower sensitivity scores during free play than mothers who did not meet full criteria, a more complex set of regression models indicated that posttraumatic stress symptom factors along with additional indicators (i.e., program participation, depression, mental health services) did not adequately predict parental sensitivity.

Mediation analyses were not conducted because depression was not a significant predictor of parental sensitivity in either the free play or teaching task. Although mediation analyses could not be conducted, regression analyses indicated that depression was a significant predictor of reexperiencing, avoidance, numbing, dysphoric arousal, and anxious arousal symptoms. Furthermore, simple regression analyses indicated that numbing symptoms predicted parental sensitivity in the free play task.

Although numbing symptoms predicted sensitivity in a simple regression model, models that included a number of significant covariates washed away this finding. In sum, among this sample of adolescent mothers, mental health functioning (depression or posttraumatic stress symptom factors) did not predict sensitivity.

Findings contradict a number of studies that have identified significant links between adverse mental health functioning and Emotional Availability (Driscoll & Easterbrooks, 2007; Easterbrooks, Chaudhuri, & Gestsdottir, 2005; Van Doesum, Hosman, Riksen-Walraven, & Hoefnagels, 2007). For example, in a sample of 69 mother-child dyads, Carter, Garrity-Roukos, Chazan-Cohen, Little,

& Briggs-Gowan (2001), found that women who experienced comorbid depression along with anxiety, substance abuse, or an eating disorder had less optimal interactions with their infants (authors used a composite score of EAS).

In addition, Feeley et al. (2011) found that mothers who reported greater PTSD symptoms were less sensitive in interactions with their infants. Contrary to the present study, Feeley et al. (2011) used a measure of PTSD specific to childbirth. Furthermore, unlike findings from this dissertation, Feeley et al.'s (2011) analyses were conducted using sum scores of PTSD rather than investigating how specific symptoms clusters of PTSD were relate to maternal sensitivity.

On average, mothers who participated in this evaluation had sensitivity scores that fell below a five, indicating that the majority of mothers fell below the optimal range for sensitivity (scores of seven and above). It could be that the lack of variability in sensitivity scores (in either the high or low range) resulted in insignificant findings for depression. We also know that among our participants, mothers with involvement in child protective services through the Department of Children and Families were less likely to allow EA filming. As a whole, these mothers may be behaving less sensitively and may be more at risk for adverse outcomes than mothers who participated in earlier studies that found significant relations between depression and emotional availability but it is also important to consider that the voluntary nature of research participation may allow the highest risk groups to opt-out of certain activities, such as behavioral observations.

Predicting parental non-hostility. Bivariate analyses indicated a significant link between PTSD and parental hostility during the free play task, where mothers who met DSM-IV criteria for full PTSD were more likely to engage in more hostile behavior (lower non-hostility) than mothers who did not meet full criteria for PTSD. No differences were found between groups for parental non-hostility during the teaching task. Similar to bivariate analyses results, regression results indicated significant relations between program participation, mental health functioning and use (i.e., number of traumatic events, depression, seeking out mental health services), factors of posttraumatic stress symptoms, and parental non-hostility during the free play task but not the teaching task. Six regression models predicting non-hostility during the free play task were tested. Five of the six models were statistically significant (see Table 19). Of the five statistically significant models, model four provided the most parsimonious fit and highest R^2 statistic than the other four significant models. Model four explained 15.3% of the variance in non-hostility during the free play task.

Findings indicated that program participation, depression, and numbing symptoms were significant predictors of non-hostility when controlling for all other variables in the model. In sum, participants in the program were more likely to receive lower non-hostility scores; participants who reported higher depression scores received higher non-hostility scores, and participants who reported higher numbing scores received lower non-hostility scores. In other words, mother receiving home visiting services displayed more hostile behavior in their

interactions with children than mothers in the comparison group. It is unclear why mothers receiving home visiting services engaged in more hostile behavior than mothers in the comparison group but we do know that mothers in the comparison group were more likely to report having received mental health services than mothers in the home visiting group. It could be that engagement in mental health services may help attenuate the effect of mental health symptoms on adverse parenting, particularly hostility. It is, however, important to note that the hostility scores for mothers in both groups (home visiting vs. comparison) fall within a similar range that indicate that mothers are engaging in slight covert hostility as opposed to the more pervasive covert or overt hostile behavior that can be seen in caregivers with lower scores.

Higher depression scores predicted lower hostility in mother-child interactions. Finally, higher mean numbing scores (i.e., restricted affect, loss of interest, and emotional distance) predicted significantly more hostile behavior by mothers in interactions with their children.

Mediation analyses were not conducted because depression was not a significant predictor of parental non-hostility in either the free play or teaching task. Although mediation analyses could not be conducted, regression analyses did indicate that depression was a significant predictor of reexperiencing, avoidance, numbing, dysphoric arousal, and anxious arousal symptoms. Finally, regression analyses indicated that reexperiencing, numbing, and avoidance symptoms predicted parental non-hostility in the free play task.

Overall, a number of significant predictors of maternal non-hostility were identified. Findings indicated that mothers receiving services had more hostile interaction with their children than mothers in the comparison group. Unfortunately, interpretation of these findings is limited due to the fact that Emotional Availability was not assessed at baseline. We are unable to determine if mothers' hostile behavior has increased, decreased, or remained stable over time. Including correlates of hostility may help us to understand why levels of hostility are higher among mothers receiving services. Easterbrooks, Bureau, and Lyons-Ruth (2012) found that maternal hostility was correlated with higher maternal depressive symptoms and to insecure attachment behavior. Among the present sample of mothers no significant differences in depression scores were found amongst mother in HVS and RIO and attachment security was not assessed in the present sample. Interpreting the findings to mean that program participation causes more hostility is not supported by any empirical literature. Furthermore, this finding would be incongruent with Healthy Families Massachusetts goals.

Increases in depression scores predicted lower hostility when controlling for traumatic events, program participation, receiving mental health services, and posttraumatic stress factors. Again, these results contradict findings by Easterbrooks, Bureau, and Lyons-Ruth (2012). This finding suggests that variables in the regression model may alter the relation between depression and hostility. It may also suggest that, among a sample of traumatized mothers,

depression may result in more maternal passive and withdrawn behavior rather than hostility.

Unlike depression, numbing symptoms did predict increases in hostile behavior. Findings indicate that manifestations of the following behaviors from the dysphoric arousal model could suggest a risk for engaging in hostile behavior: recurrent and intrusive thoughts and dreams of the traumatic event; acting or feeling as if the event were recurring; psychological distress to reminders of the event; physiological reactivity to reminders of the event; effortful avoidance of thoughts, feelings, people, or places that arouse memories of the event; difficulty remembering important aspects of the event; diminished interest in activities, feeling of emotional detachment; restricted range of affect; and a sense of a foreshortened future. As Scheeringa and Zeanah (2001) have suggested, avoidance symptoms may be associated with parental inability to correctly interpret and respond to infants' cues. Findings specific to reexperiencing and numbing symptoms of posttraumatic stress symptomatology are non-existent. However, it is important to note that negative maternal attributions have been correlated with PTSD (Schechter et al., 2006). Likewise, the non-hostility scale of the EAS notes that behavioral indicators of covert and overt hostility include pervasive low-level negative affect, manifested by impatience, boredom, resentment, teasing, or raising her voice. On a more extreme scale overtly hostile behaviors include, threats of separation, cold stares, physical aggression, shaming, ridiculing, or any behavior that frightens the child.

Furthermore, Little and Carter (2005) found that maternal hostility was associated with adverse child outcomes. They found that increases in maternal hostility were associated with increases in infant responsivity, infant involvement, and infant difficulty in emotional regulation. Among lower-risk samples, hostility scale scores are excluded or treated as collapsed variables (i.e., dichotomous variable indicating whether or not hostility is present in interaction) due to poor reliability or a limited range (Bornstein et al., 2006). Findings from high-risk samples suggest that non-hostility may be a better indicator of adverse parenting than sensitivity (Little & Carter, 2005). In other words, among samples where the average maternal sensitivity score falls within the range of therapeutic workability (scores 3 to 5), non-hostility scores may actually help identify mothers who may be at a higher risk for engaging in adverse parenting behaviors.

Finally, statistically significant findings were found for the free play task but not the teaching task. Careful investigation of the non-hostility distributions scores for the free play and teaching task indicated that the mean score for the free play task was 4.28 and 3.89 for the teaching task. On average, mothers had higher non-hostility scores in the free play task than the teaching task. Furthermore, the distribution of free play non-hostility scores indicated a slight negative skew when compared to the distribution of teaching task scores; this tells us that values are concentrated on the higher end of the scale, indicating less hostility in the free play task. Data for the teaching task appear more centered around the mean. Visual inspection of scatter plots indicate that free play non-hostility scores are more spread out with increases of posttraumatic stress

symptom factor scores than teaching task scores. Teaching task scores appear to be more concentrated towards the high end of the non-hostility scale - indicating that as posttraumatic stress symptom factor scores increase, non-hostility scores remain stable. Further interpretation of this finding may suggest that the implied structure of the teaching task may assuage maternal anxiety that can manifest as impatience, a behavioral indicator of hostility in the EAS. In sum, the teaching task may provide enough guidance to mitigate increases in hostile behavior among mothers reporting higher reexperiencing, avoidance, and numbing symptoms.

Finally, literature on PTSD and parenting suggests that higher symptom severity is associated with maladaptive parenting. Schechter et al. (2006) found that mothers who reported higher PTSD symptoms were more likely to report more negative assertions about their children. They also found that these mothers were more likely to have distorted and disengaged mental representations of their children (Schechter, et al., 2005); therefore these mothers were considered more emotionally distant or developmentally unrealistic/role-reversed. However, some studies have found that cumulative trauma may be a better indicator of suboptimal parenting than PTSD or depression (Cohen, Hien, & Batchelder, 2008; Cort, Toth, Cerulli, & Rogosch, 2011). Future studies should investigate the link between cumulative trauma, severity by symptoms clusters, and adverse parenting - by doing so, we may better understand why a cumulative history of trauma is a better indicator of suboptimal parenting. In fact, findings from this dissertation indicate

that particular symptoms clusters are related to particular adverse parenting behaviors, namely, hostility.

Aim 5: The link between depression, posttrauma symptom factors, and program utilization

The literature indicates a number of variable results regarding home visiting program utilization outcomes and mental health functioning (Ammerman, Putnam, Bosse, Teeters, & Van Ginkel, 2010; Ammerman, Shenk, Teeters, Noll, Putnam, & Van Ginkel, 2011; Damashek, Doughty, Ware, & Silovsky, 2011; Duggan, Berlin, Cassidy, Burrell, & Tandon, 2009; Harden, 2010; Stevens, Ammerman, Putnam, Gannon, & Van Ginkel, 2005). For example, Ammerman et al. (2006) found that mentally ill participants had higher levels of duration and quantity of visits. On the other hand, results are highly dependent on how program utilization is operationalized (Stevens, Ammerman, Putnam, Gannon, & Van Ginkel, 2005; Stevens, Ammerman, Putnam, & Van Ginkel, 2002).

Studies of individuals diagnosed with PTSD have also found that those with higher symptoms and more distress were more likely to seek out services (Gavrilovic, Schutzwohl, Fazel, & Priebe, 2005; Koenen, Goodwin, Struening, Hellman, & Guardino, 2004). However, other studies have also found that women and youth seem to prefer informal services rather than formal services (Gavrilovic, Schutzwohl, Fazel, & Priebe, 2005; Lippman, 2010). Although findings regarding program utilization among mentally ill participants, particularly those with depression, are variable, there is a significant gap in our understanding of the link between traumatic experiences, posttraumatic stress

symptomatology, and program utilization among adolescent mothers receiving home visiting services.

In conducting analyses for this dissertation, I found no significant relations between program utilization outcomes and PTSD. In fact, no significant relations were found between number of traumatic events experienced and program utilization outcomes. However, when using the mean factor scores of posttraumatic stress symptomatology, significant relations were identified between the avoidance factor and the dysphoric arousal factors, where increases in both these factors were significantly related with decreases in completed secondary activities. In other words, increases in avoiding activities, thoughts, and thinking about a traumatic event were related to engaging in fewer phone calls, texts, and emails with their home visitors. This relation was also found for the following symptoms: trouble sleeping, irritability, and trouble concentrating (i.e., dysphoric arousal).

Although not specific to symptom clusters, findings pertaining to treatment utilization among individuals suffering from PTSD indicate that use of services varies. For example, chronicity of PTSD symptoms, comorbid diagnoses, unwillingness to discuss traumatic experiences, and stigma around mental illness have been identified as barriers to service utilization among individuals suffering from PTSD (Foa, Keane, & Friedman, 2000; Harvey, 1996; Switzer, et al., 1999). Studies also indicate that youth and women diagnosed with PTSD appear to prefer informal supports rather than formal ones (Gavrilovic, Schutzwahl, Fazel, & Priebe, 2005; Lippman, 2010). Prevention and intervention

programs should keep in mind that individuals with histories of trauma and potential PTSD diagnoses may be difficult to engage in services. Furthermore, researchers should consider investigating how certain symptom clusters of PTSD affect engagement in services. Simply differentiating between those diagnosed with PTSD and those without may not address why certain individuals are difficult to engage in treatment. For example, individuals with high avoidance symptoms may have differing reasons for not engaging in services than individuals with high reexperiencing symptoms. Finally, it is important to note that high distress in one or two symptom categories does not result in a diagnosis of PTSD. However, high distress in one or two symptom clusters may result in enough impairment to affect a young mother's ability to parent optimally.

Programs should also be cognizant of not alienating participants by prematurely or forcefully inquiring about traumatic experiences or posttraumatic stress symptoms too soon in the engagement process. Although assessment of trauma is indicated for adolescent mothers, findings also suggest that it is crucial to build rapport and trust before attempting to assess any trauma history (Stevens, Ammerman, Putnam, Gannon, & Van Ginkel, 2005). Home visiting programs have a particularly important advantage in connecting traumatized adolescent mothers suffering from PTSD with services since although the program is a formal support mechanism, young mothers often perceive their home visitor as a supportive friend (Krysiak, LeCroy, & Ashford, 2008). Perceiving their home visitors as a *friend* rather than a *professional* may allow a mother suffering from PTSD to become more open to the possibility of more formal treatment. This,

however, may only be possible if the home visitor is adequately trained to assess for trauma and PTSD as well as educate mothers about the symptoms of PTSD.

Some studies investigating program utilization among home visiting participants found that mothers suffering from depression were more likely to enroll and engage in services than mothers without depression (Ammerman et al., 2006; Damashek, Doughty, Ware, & Silovsky, 2011). Similar findings exist among participants diagnosed with PTSD. For example, Gavrilovic, Schutzwahl, Fazel, and Priebe (2005) found that individuals with higher levels of reported PTSD symptomatology sought out more services than those with lower symptoms. This finding was also supported by Koenen et al. (2004). However, it is important to restate that these differences were not supported by the findings of this dissertation.

Future research should consider investigating patterns of home visitation completion rather than using a sum or mean score of this indicator. Recognizing fluctuations in program use, Ammerman et al. (2006) operationalized engagement using the following three indicators: 1) duration; 2) number of home visits received, and 3) gaps in service between home visits, understanding that participants did not use program services at the same rate throughout their enrollment. They found that higher risk mothers with fewer supports engaged more in home visiting services than lower risk mothers who reported more informal supports. Higher risk mothers may see their interactions with their home visitor as their only source of support or social engagement, therefore they depend more on them and utilize more program services.

Similar to findings by Ammerman et al. (2006), a significant number of mothers in this study disengaged (26%) at an early point in their enrollment, receiving fewer than five visits during a nine to eighteen month period. Future studies should also aim to understand why these mothers disengage, and cost-benefit analyses may be conducted in order to determine if a tier-system of care may be more effective, with higher need participants receiving more services at key points in time (i.e., enrollment, child birth, and any other major events) than lower need participants. Determining participants' needs would suggest the need to implement a regular assessment schedule. For example, programs would conduct status updates that assess for risk exposure or participant-identified concerns, on a regular basis. Since a number of programs already have a set schedule for completing individualized service/treatment plans, assessment of risk and needs could be incorporated into this existing process. However, it would be important to add that within this *assessment of need*, exposure to trauma and posttraumatic stress symptomatology should be considered. Although a number of programs do determine service level (i.e., number of home visits received within an identified time period) based on need, seldom is trauma exposure a standard consideration in the assessment.

Given that a number of home visiting programs provide services (i.e., communications with home visitors outside of the home visit, social and support groups, recreational outings, advocacy opportunities) in addition to home visitation, program staff and researchers, need to consider including these additional services in their operationalization of *utilization*. For example, a

number of Healthy Families programs across Massachusetts offer families a series of parenting groups throughout the year. However, seldom do you see these types of services incorporated into the assessment of program utilization in research/evaluation studies. Similar to group participation, secondary activities are services that may positively impact program engagement and maternal functioning. In fact, secondary activities can be considered dynamic in that the function that they serve is dependent on when they are occurring. These activities may aid in forming an alliance or connection between the home visitor and the mother. For example, by providing rides or goods directly to the mother, the home visitor provides instrumental and informational support that sends a message to the mother that she is dependable and willing to support her. Once this alliance is formed, these activities may be a source of emotional/social support for the mother. For example, as a bond develops, the mother may initiate more phone contact with the home visitor in order to seek out guidance/advice. In doing so the mother indicates her trust of the home visitor.

In sum, these findings suggest that service providers working with adolescent mothers should be trained in recognizing the symptoms of PTSD and should be aware of appropriate community mental health services in order to provide necessary referrals. In fact, Leis, Mendelson, Perry, and Tandon (2011) suggest that home visiting services may be well-equipped to facilitate mental health treatment seeking among participants. However, they suggest that education around mental health diagnoses is as important for the home visitor as it is for the client. They also suggest that "home visiting staff should be trained to

conduct routine mental health screenings throughout the perinatal period and to help clients to engage in mental health care when indicated" (Leis, Mendelson, Perry, & Tandon, 2011, p. 318). These suggestions are especially salient for paraprofessional home visitors who lack the mental health knowledge of home visitors trained in the fields of nursing and social work.

Limitations

Studies using data beyond one time point must contend with attrition. Approximately 23% of the 371 participants in this study either dropped out before their T2 interview or were not located in time to participate. In addition to having participants drop out of the study or miss their T2 interview window, a significant number of participants chose not to take part in the Emotional Availability tasks (17% of participants who were interviewed at T2). We were not able to collect data on approximately 11% of participating mothers at T2. Some of the reasons for missing data were due to technical difficulties with recording equipment, rescheduling difficulties, children who were taken into DCF custody, and death of participants or their children. Therefore, there were data missing for 51% of participants due to no participation at all in the T2 interview (23%), voluntarily opting out of participating in the EA tasks or no video data due to other reasons (28%). Given the significant decrease in the number of participants, this study would have benefitted from Multiple Imputation. Multiple Imputation would have allowed an increase in power by retaining a number of participants. Fortunately, no statistical differences were found among participants who were

able to take part in T2 and participants who refused, dropped out, or were unable to participate for any other reason.

Another limitation of the study involved the assessment of traumatic experiences. The PTSD-RI (Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998) is widely used for assessing trauma histories and PTSD symptoms among populations of children and adolescents. One of the benefits of this measure is that all items are worded in ways that are very accessible to younger populations. However, the assessment of traumatic events is limited to 12 events that do not fully capture the experiences of high-risk adolescent populations. For example, one of the trauma-related questions in the measure asks about being sexually molested by an adult or someone older than the respondent. A number of participants refused to endorse this question and instead checked off the 13th item of the trauma assessment portion of the PTSD-RI. This 13th item asks about any other event in which the respondent felt like they were scared or their life was in danger. Only if the participant identified this 13th item as their "most frightening event" would we collect more information on this trauma. A number of participants endorsed this 13th item and they also identified it as their most frightening event. Upon further investigation we found that for a number of participants this *catch-all* category included rape and attempted rape. For a number of participants in this study the events listed in the PTSD-RI did not fully capture the extent of their traumatic experiences

Furthermore, the measure does not determine the chronicity of a particular traumatic experience. We may know that a respondent witnessed domestic

violence but we are unable to determine if this exposure occurred only once or over an extended period of time. The literature and findings from this study indicate that adolescent mothers report significant exposure to trauma. Future studies should not only assess the presence of a traumatic event but they should also aim to determine how long the respondent was exposed to the particular trauma.

A third limitation of this study was the assessment of mental health functioning among this population of adolescent mothers. Literature regarding trauma exposure among adolescents in high-risk contexts and adolescent mothers in particular, clearly indicates that these populations are exposed to a wide variety of trauma. Furthermore, findings suggest that a number of youth are exposed to the same traumatic experience over an extended period of time (Buka, Stichick, Birdthistle, & Earls, 2001; Horowitz, Weine, & Jekel, 1995; Lipschitz, Rasmussen, Anyan, Cromwell, & Southwick, 2000; Macy, Barry, & Noam, 2003). Complex PTSD posits that cumulative and/or chronic trauma has an adverse impact on a person's functioning that may not be adequately captured by the criteria for PTSD (Herman, 1992; 1997; Ford & Courtois, 2009). In fact, a number of studies indicate high levels of comorbidity between PTSD and other mental health diagnoses (i.e., depression, ADHD, other anxiety disorders) exist (Ammerman, Putnam, Chard, Stevens, & Van Ginkel, 2011; Dixon, Howie, & Straling, 2005; Cauffman, Feldman, Waterman, & Steiner, 1998; Lipschitz, Rasmussen, Anyan, Cromwell, & Southwick, 2000).

In considering the chronic rates of trauma exposure among certain populations, as well as the high levels of comorbidity associated with PTSD, Herman (1992; 1997) proposed a new diagnosis called Complex PTSD and described it as alterations in 1) affect regulation; 2) consciousness; 3) self-perception; 4) perception of the perpetrator; 5) relations with others; and 6) systems of meaning due to "a history of subjection to totalitarian control over a prolonged period (months to years). Examples include hostages, prisoners of war.....survivors of domestic battering, childhood physical or sexual abuse, and organized sexual exploitation" (Herman, 1997, p. 121). Although this study included measures of PTSD and depression, additional measures of the constructs of Complex PTSD were not included. Future studies conducted among populations with extensive histories of trauma would highly benefit from including measures of Complex PTSD.

Another limitation of this study was limiting my inquiry to the exploration of existing factor models. However, the literature does appear to indicate that a vast array of alternate factor models of posttraumatic stress symptomatology exists. Adjustments to the most adequate model may have resulted in an alternate model that provided an excellent fit. Furthermore, this better fitting alternate factor model, as well as incorporating multiple imputation to account for missing data, could have permitted the use of Structural Equation Modeling (SEM). As Iacobucci (2008) notes, "SEM provides the state-of-the-art approach to test for mediated relationships among constructs particularly when multiple items of variables have been measured to capture and focal constructs" (p. 19). Future

studies should consider the use of SEM in order to understand the complex interplay among all variables of interest.

Little was known with regards to home visiting program use among traumatized adolescent mothers. Because of this gap, this dissertation served as a starting point to understanding how posttraumatic stress symptomatology may affect program utilization. However, it is important to note that a final limitation of this study was the use of count data to determine participants' program utilization. A number of studies have considered a *frequency* or *intensity* variable (i.e., total amount of home visits/number of months enrolled) as an adequate indicator of program utilization but more recent research indicates that this method does not capture fluctuations in program use over time (Ammerman et al., 2006). Future studies should consider analyzing trajectories of program use rather than using cumulative data or intensity variables.

Conclusion

Findings from this dissertation serve to add to the limited knowledge base surrounding the experiences of trauma and its effects among adolescent mothers. In sum, I found that: 1) the majority of mothers reported extensive trauma histories, including exposure to community violence, the witnessing of domestic violence, and traumatic injury/loss of a loved one; 2) when using DSM-IV PTSD criteria, almost half of mothers in this study met full or partial criteria for PTSD; 3) the current three factor model of PTSD does not adequately represent the post trauma experiences of adolescent mothers in this study; 4) alternate models of posttraumatic stress symptomatology may provide a better fit, however alterations

to these proposed models need to be made in order to improve said fit; 5) a possible link exists between increases in numbing symptoms and sensitivity during an open-ended free play task between a mother and her child, with greater numbing symptoms predicting less sensitivity; 6) depression is a significant predictor of non-hostility during an open-ended free play task between a mother and her child, with increases in depression predicting decreased hostility, once posttraumatic symptom factors and other mental health functioning indicators are controlled for; 7) numbing symptoms are also a significant predictor of non-hostility during an open-ended free play task between a mother and her child, with increases in numbing symptoms predicting increases in hostility, once mental health functioning indicators and other posttraumatic symptom factors are controlled for; 8) reexperience, avoidance, and numbing symptoms are related to non-hostility, with increases in all three symptom factors predicting more hostile behavior by the mother in her interactions with her child; 9) finally, increases in avoidance and dysphoric arousal symptoms are related to decreases in the number of completed secondary activities.

Trauma and posttraumatic stress symptomatology certainly impact the lives of adolescent mothers. Future studies should not only assess for trauma but they should test the invariance of posttraumatic stress symptomatology over time, in order to determine the presence of any changes in symptomatology. Furthermore, studies should consider including child developmental outcomes in order to begin to understand how traumatized mothers' psychological functioning may impact the cognitive, social, and emotional development of their child over

time. Finally, intervention programs should at least consider implementing curriculum to teach home visitors the importance of trauma assessment given the number of adverse outcomes associated with extensive trauma histories among adolescent parents. These programs should also connect with community resources to identify agencies that could provide mental health services tailored towards treating traumatized individuals.

Table 1

*Summary of Diagnostic Criteria for Posttraumatic Stress Disorder (PTSD)***Cluster A1 and A2**

- 1) The person was experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others AND;
- 2) The person's response involved intense fear, helplessness, or horror

Cluster B - Symptoms of persistent reexperiencing, as indicated by at least one of the following (Reexperiencing/Intrusion):

- 1) Recurrent and intrusive distressing recollections of the event
- 2) Recurrent distressing dreams of the event
- 3) Acting or feeling as if the traumatic event were recurring
- 4) Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
- 5) Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event

Cluster C - Symptoms of persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness, as indicated by at least three of the following (Avoidance):

- 1) Efforts to avoid thoughts, feelings, or conversations associated with the trauma
- 2) Efforts to avoid activities, places, or people that arouse recollections of the trauma
- 3) Inability to recall an important aspect of the trauma
- 4) Markedly diminished interest or participation in significant activities
- 5) Feeling of detachment or estrangement from others
- 6) Restricted range of affect
- 7) Sense of foreshortened future

Cluster D - Symptoms of persistent increased arousal, as indicated by at least two of the following (Hyperarousal):

- 1) Difficulty falling or staying asleep
- 2) Irritability or angry outbursts
- 3) Difficulty concentrating
- 4) Hypervigilance
- 5) Exaggerated startle response

Source: DSM-IV-TR (APA, 2000)

Table 2

Hypothesized Factor Structures for Posttraumatic Stress Disorder (PTSD) Symptom Items

Item	DSM-IV-TR Criterion	PTSD-RI- Item	Factor Models			
			Three Factor Model (DSM-IV)	Numbing Model (King et al., 1998)	Dysphoria Model (Simms et al., 2002)	Dysphoric Arousal Model (Elhai et al., 2011)
Intrusive thoughts	B1	3	R	R	R	R
Nightmares	B2	5	R	R	R	R
Flashbacks	B3	6	R	R	R	R
Upset by reminders	B4	2	R	R	R	R
Physiological reactivity	B5	18	R	R	R	R
Avoid thought and talking	C1	9	A/N	EA	A	A
Avoid activities	C2	17	A/N	EA	A	A
Cannot remember	C3	15	A/N	EN	D	N
Loss of interest	C4	7	A/N	EN	D	N
Emotional distance	C5	8	A/N	EN	D	N
Restricted affect	C6	10/11	A/N	EN	D	N
Future plans	C7	19/21	A/N	EN	D	N
Trouble sleeping	D1	13	H	H	D	DA
Irritable	D2	4/20	H	H	D	DA
Difficulty concentrating	D3	16	H	H	D	DA
Hypervigilant	D4	1	H	H	H	AA
Startle response	D5	12	H	H	H	AA

Note: PTSD-RI = University of California, Los Angeles PTSD Reaction Index (Adolescent version); R = reexperiencing; A/N = avoidance/numbing; H = hyperarousal; EA = effortful avoidance; EN = emotional numbing; A = avoidance; D = dysphoria; N = numbing; DA = dysphoric arousal; AA = anxious arousal

Table 3

Demographic Characteristics of Participants by Program Participation (n = 283)

	Full Sample %; Mean (SD); Range	HVS Sample (n = 157) %; Mean (SD)	RIO Sample (n = 126) %; Mean (SD)	$\chi^2/t\text{-value (df), } p$
Maternal age at T1	18.6 (1.29); 16.08-21.25	18.66 (1.31)	18.53 (1.28)	$t(280)=-.0861, p=.390$
Race				$\chi^2(4)=6.731, p=.151$
<i>Black non-Hispanic</i>	19.80%	12.40%	7.40%	
<i>White non-Hispanic</i>	37.10%	17.30%	19.80%	
<i>Hispanic/Latina</i>	34.60%	21.60%	13.10%	
<i>Asian non-Hispanic</i>	2.50%	1.10%	1.40%	
<i>Multi-racial/multi ethnic non-Hispanic</i>	6.00%	3.20%	2.80%	
Last grade completed				$\chi^2(4)=4.776, p=.311$
<i>9th grade or below</i>	18.60%	9.70%	9.00%	
<i>10th grade</i>	19.70%	11.80%	7.90%	
<i>11th grade</i>	20.40%	10.80%	9.70%	
<i>12th grade or GED</i>	33%	16.80%	16.10%	
<i>Some college</i>	8.30%	6.10%	2.20%	
Occupation				$\chi^2(3)=4.934, p=.177$
<i>Not employed, not in school</i>	40.40%	24.10%	16.30%	
<i>Not employed, in school</i>	36.50%	18.40%	18.10%	
<i>Employed, not in school</i>	13.10%	6%	7.10%	
<i>Employed, in school</i>	9.90%	6.70%	3.20%	
Relationship Status				$\chi^2(2)=.353, p=.838$
<i>Single</i>	26.50%	14.50%	12.10%	
<i>Dating</i>	21.50%	11.30%	10.30%	
<i>Committed relationship/married</i>	52.00%	29.40%	22.30%	
Paternal Age	20.93 (4.352); 16-51	20.83 (4.45)	21.07 (4.24)	$t(268)=0.447, p=.655$
Living Arrangements				$\chi^2(6)=10.447, p=.107$
<i>Alone</i>	0.70%	0.00%	0.70%	
<i>With parents or adult relatives/guardians</i>	61.40%	32.90%	28.60%	
<i>With partner only</i>	9.30%	4.60%	4.60%	
<i>With partner AND parents or adult relatives /guardians</i>	16.10%	9.30%	6.80%	
<i>Institution</i>	6.80%	3.20%	3.60%	
<i>With partner and peers</i>	1.80%	1.40%	0.40%	
Number of pregnancies	1.24 (0.524); 1-4 67.50%	1.24 (.513) 36.70%	1.23 (.539) 30.70%	$t(280)=-0.214, p=.831$ $\chi^2(1)=.251, p=.617$

Mother pregnant at T1				
Pregnancy planned	12.60%	9.00%	3.60%	$\chi^2(1)=4.166, p=.041$
Number of Traumatic Events	3.36 (2.13); 1-11	3.29 (2.03)	3.46 (2.25)	$t(281)=0.682, p=.496$
PTSD				$\chi^2(2)=.456, p=.796$
<i>Full PTSD</i>	21.90%	11.70%	10.20%	
<i>Partial PTSD</i>	24.00%	14.10%	9.90%	
<i>No PTSD</i>	54.10%	29.70%	24.40%	
Depression (above clinical cut-off)	40.60%	23.00%	17.70%	$\chi^2(1)=.086, p=.770$
Receiving mental health services	25.40%	11.30%	14.10%	$\chi^2(1)=4.759, p=.029$

Table 4

Group differences for parenting outcome variables by program participation and program utilization distribution

	Full Sample %; Mean (SD); Range	HVS Sample %; Mean (SD)	RIO Sample %; Mean (SD)	<i>t-value (df), p</i>
Parenting Outcomes				
Free Play Sensitivity	4.73 (1.24) 1.00-8.00	4.68 (1.29)	4.80 (1.19)	<i>t</i> (134)=0.570, <i>p</i> =.570
Teaching Task Sensitivity	4.43 (1.14) 1.33-7.00	4.42 (1.12)	4.44 (1.16)	<i>t</i> (128)=0.095, <i>p</i> =.924
Free Play Non-hostility	4.28 (0.87) 1.00-5.00	4.14 (0.90)	4.44 (0.82)	<i>t</i> (134)=2.031, <i>p</i> =.044
Teaching Task Non-hostility	3.89 (0.92) 1.00-5.00	3.80 (0.96)	3.99 (0.87)	<i>t</i> (128)=1.146, <i>p</i> =.254
Program Utilization Outcomes				
Completed Home Visits	N/A	18.45 (14.68) 0-55	N/A	
Groups Attended	N/A	1.83 (3.42) 0-19	N/A	
Completed Secondary Activities	N/A	17.00 (21.31) 0-122	N/A	
Duration (in days)	N/A	301.10 (120.25) 38- 578	N/A	

Table 5

*Distribution of Number of Traumatic Events Among Participants
(n=371)*

	Percentage (n)
No Events endorsed	14.3% (53)
Event endorsed	85.7% (318)
1 Events	18.6% (69)
2 Events	18.1% (67)
3 Events	12.7% (47)
4 Events	12.1% (45)
5 Events	9.4% (35)
6 Events	6.2% (23)
7 Events	4.9% (18)
8 Events	2.2% (8)
9 Events	0.8% (3)
10 Events	0.3% (1)
11 Events	0.5% (2)
Mean	2.93
SD	2.32

Table 6

Distribution of Types of Traumatic Events Among Participants (n=318)

	Percentage (n)
Earthquake	1.3% (5)
Fire, tornado, flood, or hurricane	18.1% (67)
Bad accident	21.6% (80)
Exposure to war	2.2% (8)
Physical violence at home	18.3% (68)
Witnessing physical violence at home	27.8% (103)
Physical violence in community	23.2% (86)
Witnessing physical violence in community	52.6% (195)
Seeing a dead body in community	18.9 % (70)
Sexual abuse	20.9% (77)
Violent death or injury of loved one	52.3% (193)
Traumatic medical treatment in hospital	19.7% (73)
Other	19.9% (61)

Table 7

Distribution of Participants Who Met Full and Partial Criteria (DSM-IV) for PTSD (n =304)

Criterion/Item	DSM-IV Cluster	PTSD-RI-Item	Percentage (n)	Mean (sd)
Traumatic event (n=371)	A1	1-13	85.8% (318)	2.93 (2.32)
Immediate reaction	A2	20-32	95.4% (290)	
Reexperiencing (1 symptom)	B	3, 5, 6, 2, 18	62.5% (190)	1.58 (1.64)
<i>Intrusive thoughts (B1)</i>				
<i>Nightmares (B2)</i>				
<i>Flashbacks (B3)</i>				
<i>Upset by reminders (B4)</i>				
<i>Physiological reactivity (B5)</i>				
Avoidance/Numbing (3 symptoms)	C	9, 17, 15, 7, 8, 10/11, 19/21	30.4% (92)	1.82 (2.02)
<i>Avoid thought and talking (C1)</i>				
<i>Avoid activities (C2)</i>				
<i>Cannot remember (C3)</i>				
<i>Loss of interest (C4)</i>				
<i>Emotional distance (C5)</i>				
<i>Restricted affect (C6)</i>				
<i>Future plans (C7)</i>				
Hyperarousal (2 symptoms)	D	13, 4/20, 16, 1, 12	56.2% (177)	2.08 (1.66)
<i>Trouble sleeping (D1)</i>				
<i>Irritable (D2)</i>				
<i>Difficulty concentrating (D3)</i>				
<i>Hypervigilant (D4)</i>				
<i>Startle response (D5)</i>				
Full PTSD	A, B, C, D		23.8% (72)	
Partial PTSD	A + 2 symptom cluster		23.1% (70)	

Note: PTSD-RI = University of California, Los Angeles PTSD Reaction Index (Adolescent version)

Table 8

Demographic Characteristics of Participants by PTSD status (n = 283)

	Full PTSD (n = 62) %; Mean (SD); Range	Partial PTSD (n = 68) %; Mean (SD); Range	No PTSD (n = 153) %; Mean (SD); Range	$\chi^2/F (df), p$
Maternal age at T1	18.57 (1.24) 16.17-20.83	18.46 (1.35) 16.08-21.00	18.67 (1.30) 16.08-21.25	$F(2, 279)=0.689, p=.503$
Race				$\chi^2(8)=8.680, p=.370$
<i>Black non-Hispanic</i>	4.60%	6.00%	9.20%	
<i>White non-Hispanic</i>	8.50%	8.50%	20.10%	
<i>Hispanic/Latina</i>	7.80%	7.40%	19.40%	
<i>Asian non-Hispanic</i>	1.10%	0.40%	1.10%	
<i>Multi-racial/multi ethnic non-Hispanic</i>	0.00%	1.80%	4.20%	
Last grade completed				$\chi^2(8)=8.697, p=.368$
<i>9th grade or below</i>	6.10%	4.30%	8.20%	
<i>10th grade</i>	3.60%	5.40%	10.80%	
<i>11th grade</i>	5.40%	5.00%	10%	
<i>12th grade or GED</i>	5.40%	7.50%	20.10%	
<i>Some college</i>	1.10%	1.80%	5.40%	
Occupation				$\chi^2(6)=8.867, p=.181$
<i>Not employed, not in school</i>	12.10%	9.90%	18.40%	
<i>Not employed, in school</i>	6.70%	8.50%	21.30%	
<i>Employed, not in school</i>	1.40%	3.50%	8.20%	
<i>Employed, in school</i>	1.80%	2.10%	6.00%	
Relationship Status				$\chi^2(4)=1.812, p=.770$
<i>Single</i>	7.10%	6.40%	13.10%	
<i>Dating</i>	4.60%	5.30%	11.70%	
<i>Committed relationship/married</i>	9.90%	12.40%	29.40%	
Paternal Age	21.09 (4.45) 16-39	20.06 (2.70) 16-29	21.25 (4.84) 16-51	$F(2, 279)=1.718, p=.181$
Living Arrangements				$\chi^2(12)=13.450, p=.337$
<i>Alone</i>	0.40%	0.00%	0.40%	
<i>With parents or adult relatives/guardians</i>	14.60%	13.20%	33.60%	
<i>With partner only</i>	1.40%	1.40%	6.40%	
<i>With partner AND parents or adult relatives /guardians</i>	2.90%	3.60%	9.60%	
<i>Institution</i>	1.40%	3.20%	2.10%	
<i>With partner and peers</i>	0.40%	0.70%	0.70%	
Number of pregnancies	1.33 (0.60) 1-4	1.25 (0.53) 1-3	1.20 (0.49) 1-3	$F(2, 279)=1.410, p=.246$
Mother pregnant at T1	14.10%	15.90%	37.50%	$\chi^2(2)=.527, p=.768$

Pregnancy planned	2.20%	2.50%	7.90%	$\chi^2(2)=1.177, p=.555$
Number of Traumatic Events	4.50 (2.51) 1-11	4.00 (2.16) 1-11	2.62 (1.60) 1-9 ^{a,b}	$F(2, 279)=24.762, p<.001$
Depression (above clinical cut-off)	13.80%	11.00%	15.90%	$\chi^2(2)=21.425, p<.001$
Receiving mental health services	9.50%	7.10%	8.80%	$\chi^2(2)=17.963, p<.001$

a. Participants who met full criteria for PTSD reported significantly more traumatic events than those who did not meet criteria; b. Participants who met partial criteria for PTSD reported significantly more traumatic events than those who did not meet criteria.

Table 9

Group differences for parenting and program utilization outcome variables by PTSD status

	Full PTSD Mean (SD); Range	Partial PTSD Mean (SD); Range	No PTSD Mean (SD); Range	<i>F(df), p</i>
Parenting Outcomes				
Free Play Sensitivity	4.13 (1.56) 1-7	4.79 (1.22) 2.33-8.00	4.93 (1.05) 2.00-7.00	<i>F(2, 133)=4.366, p= .015</i>
Teaching Task Sensitivity	4.10 (1.38) 1.33-7.00	4.54 (1.20) 1.50-7.00	4.50 (0.99) 2.00-7.00	<i>F(2, 127)=1.462, p= .236</i>
Free Play Non-hostility	4.01 (1.18) 1.00-5.00	4.15 (0.86) 2.33-5.00	4.44 (0.71) 3.00-5.00	<i>F(2, 133)=3.151, p= .046</i>
Teaching Task Non-hostility	3.78 (1.06) 1.00-5.00	3.87 (0.90) 1.5-5.00	3.95 (0.88) 2.00-5.00	<i>F(2, 127)=0.337, p= .715</i>
Program Utilization Outcomes				
Completed Home Visits	17.97 (14.601) 0-46	21.74 (15.75) 0-55	17.11 (14.13) 0-54	<i>F(2, 152)=1.356, p= .261</i>
Groups Attended	1.08 (1.94) 0-9	2.10 (3.88) 0-19	1.98 (3.63) 0-18	<i>F(2, 118)=0.760, p= .470</i>
Completed Secondary Activities	16.83 (13.07) 3-51	22.86 (18.74) 2-65	22.68 (24.56) 0-122	<i>F(2, 114)=0.728, p= .485</i>
Duration (in days)	307.42 (117.60) 100-468	328.82 (111.48) 75-567	286.83 (124.26) 38-578	<i>F(2, 114)=1.240, p= .293</i>

Table 10

Intercorrelations for the 17 Symptoms of PTSD by Clusters

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. B1	--																
2. B2	.671 **	--															
3. B3	.583 **	.449 **	--														
4. B4	.584 **	.530 **	.394 **	--													
5. B5	.579 **	.520 **	.503 **	.514 **	--												
6. C1	.410 **	.393 **	.340 **	.504 **	.512 **	--											
7. C2	.476 **	.441 **	.451 **	.496 **	.640 **	.521 **	--										
8. C3	.132 *	.186 **	.125 *	.159 **	.167 **	.075	.189 **	--									
9. C4	.417 **	.299 **	.395 **	.385 **	.419 **	.355 **	.362 **	.179 **	--								
10. C5	.381 **	.353 **	.353 **	.354 **	.377 **	.388 **	.293 **	.215 **	.561 **	--							
11. C6	.410 **	.331 **	.322 **	.343 **	.385 **	.377 **	.348 **	.210 **	.530 **	.621 **	--						
12. C7	.338 **	.275 **	.213 **	.301 **	.323 **	.304 **	.268 **	.272 **	.314 **	.367 **	.408 **	--					
13. D1	.409 **	.479 **	.316 **	.299 **	.415 **	.291 **	.331 **	.248 **	.359 **	.415 **	.365 **	.313 **	--				
14. D2	.405 **	.362 **	.322 **	.354 **	.286 **	.232 **	.182 **	.115	.417 **	.431 **	.406 **	.314 **	.462 **	--			
15. D3	.365 **	.323 **	.251 **	.328 **	.341 **	.391 **	.328 **	.226 **	.384 **	.449 **	.414 **	.459 **	.466 **	.409 **	--		
16. D4	.313 **	.297 **	.176 **	.417 **	.327 **	.341 **	.329 **	.141 *	.259 **	.177 **	.220 **	.174 **	.209 **	.211 **	.167 **	--	
17. D5	.323 **	.307 **	.175 **	.332 **	.340 **	.285 **	.339 **	.062	.223 **	.233 **	.202 **	.214 **	.463 **	.221 **	.267 **	.292 **	--

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

Table 11

Intercorrelations for Traumatic Events, Depression, Parenting Outcomes, and Program Utilization Outcomes

Variables	18	19	20	21	22	23	24	25	26	27
18. Traumatic Events	--									
19. Depression	0.236 **	--								
20. Sensitivity (Free Play)	-0.059	-0.020	--							
21. Sensitivity (Teaching Task)	0.001	0.025	0.654 **	--						
22. Non-hostility (Free Play)	-0.017	0.071	0.627 **	0.506 **	--					
23. Non-hostility (Teaching Task)	-0.063	0.014	0.399 **	0.672 **	0.616 **	--				
24. Completed HV	-0.133	0.108	-0.078	-0.195	-0.012	-0.195	--			
25. Groups Attended	-0.035	0.054	0.056	0.076	0.139	0.131	0.398 **	--		
26. Completed SA	-0.140	-0.095	-0.015	-0.063	-0.028	-0.192	0.527 **	0.263 **	--	
27. Duration	-0.039	0.090	0.008	-0.147	0.097	-0.168	0.789 **	0.270 **	0.470 **	--

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

Table 12

Intercorrelations for traumatic events, outcome variables and PTSD symptoms (variables 1-17)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
18. Traumatic Events	.372 **	.360 **	.181 **	.331 **	.369 **	.303 **	.280 **	.053	.208 **	.281 **	.274 **	.174 **	.324 **	.216 **	.215 **	.161 **	.203 **
19. Depression	.242 **	.236 **	.222 **	.281 **	.296 **	.294 **	.307 **	.180 **	.272 **	.389 **	.359 **	.373 **	.350 **	.245 **	.311 **	.198 **	.268 **
20. Sensitivity (Free Play)	-.141	-.146	-.111	-.097	-.164	-.204 *	-.270	-.090	-.239 **	-.102	-.148	-.108	-.091	-.082	.005	-.074	-.088
21. Sensitivity (Teaching Task)	-.058	-.011	-.117	-.016	-.023	-.082	.101	.087	-.136	-.150	-.114	-.019	.010	-.182 *	.047	-.065	-.067
22. Non-hostility (Free Play)	-.189	-.196 *	-.198 *	-.184 *	-.288 **	-.261 **	.010	.064	-.248 **	-.141	-.183 *	-.212 *	-.035	-.207 *	-.022	-.053	-.087
23. Non-hostility (Teaching Task)	-.093	-.016	-.139	-.085	-.024	-.147	.910	.221 *	-.096	-.119	-.023	-.064	.044	-.189 *	.019	-.083	-.064
24. Completed HV	.034	-.021	.083	-.137	-.038	-.141	-.059	-.010	.083	.037	.019	.099	-.014	-.081	-.021	-.135	.026
25. Groups Attended	.003	.042	.028	-.070	.036	-.020	.000	.110	-.031	-.079	.038	.120	-.078	-.171	-.074	-.160	-.009
26. Completed SA	-.029	-.077	-.036	-.189 *	-.136	-.151	-.218 *	.004	-.067	-.135	-.098	.027	-.189 *	-.199 *	-.088	-.179	-.097
27. Duration	.067	-.014	.059	-.104	-.062	-.169	-.103	-.027	.095	.074	.043	.103	-.070	-.049	.085	-.113	.072

Note. *p<.05. **p<.01. ***p<.001.

Table 13

Means, Standard Deviations, and Ranges for the 17 Symptom items of the PTSD-RI

	Mean	SD	Range
B1 (Intrusive thoughts)	0.958	1.220	0.00 - 4.00
B2 (Nightmares)	0.986	1.190	0.00 - 4.00
B3 (Flashbacks)	0.389	0.747	0.00 - 3.00
B4 (Upset by reminders)	1.728	1.302	0.00 - 4.00
B5 (Physiological reactivity)	1.092	1.320	0.00 - 4.00
C1 (Avoid thoughts and talking about event)	1.346	1.464	0.00 - 4.00
C2 (Avoid activities)	1.095	1.407	0.00 - 4.00
C3 (Cannot remember)	0.474	0.831	0.00 - 3.00
C4 (Loss of interest)	0.703	1.113	0.00 - 4.00
C5 (Emotional distance)	0.721	1.019	0.00 - 4.00
C6 (Restricted affect)	0.749	1.071	0.00 - 4.00
C7 (Future plans)	0.438	0.820	0.00 - 4.00
D1 (Trouble sleeping)	1.357	1.500	0.00 - 4.00
D2 (Irritable)	1.304	1.203	0.00 - 4.00

D3 (Difficulty concentrating)	0.873	1.231	0.00 - 4.00
D4 (Hypervigilant)	1.590	1.486	0.00 - 4.00
D5 (Startle response)	1.254	1.360	0.00 - 4.00

Table 14

Goodness-of-Fit Indices of Five Models of Posttraumatic Stress Symptoms (n= 283)

Model	X^2	df	p	ΔX^2	Δdf	p	RMSEA	RMSEA 90% CI	NNFI	CFI
1. Null	1912.57	136	<.001	--	--	--	0.357	0.348-0.365	0.63	0.63
2. Dysphoric arousal model (five factor; Elhai et al.)	243.08	109	<.001	--	--	--	0.066	0.055-0.077	0.97	0.97
3. Numbing model (four factor; King et al.)	274.02	113	<.001	30.94	4	<.001	0.073	0.062-0.084	0.96	0.97
4. Dysphoria model (four factor; Simms et al.)	274.45	113	<.001	31.37	4	<.001	0.073	0.062-0.083	0.96	0.97
5. DSM-IV model (three factor; APA)	362.39	116	<.001	119.31	7	<.001	0.093	0.083-0.10	0.94	0.95

Note. RMSEA = root mean square error of approximation; NNFI = nonnormed fit index; CFI = comparative fit index.
 Models 2, 3, and 5 are nested. Models 2 and 4 are nested.

Table 15

Correlations between Latent Constructs for the Five Factor Dysphoric Arousal Posttraumatic Stress Model

	Reexperiencing	Avoidance	Numbing	Dysphoric Arousal	Anxious Arousal
Reexperiencing	1.00				
Avoidance	0.87 (0.04) 21.95	1.00			
Numbing	0.67 (0.05) 14.82	0.65 (0.06) 11.21	1.00		
Dysphoric Arousal	0.72 (0.05) 15.02	0.60 (0.07) 8.92	0.83 (0.04) 19.46	1.00	
Anxious Arousal	0.76 (0.08) 9.48	0.81 (0.09) 9.01	0.54 (0.09) 6.15	0.74 (0.09) 8.17	1.00

Table 16

Means, Standard Deviations, and Range for Dysphoric Arousal Model Factors by Program Participation (n = 283)

	Full Sample Mean (SD) Range	HVS Sample (n = 157) Mean (SD)	RIO Sample (n = 126) Mean (SD)	<i>t-value (df), p</i>
Factor 1: Reexperiencing	1.03 (.922); 0.0-3.8	1.01 (.922)	1.06 (.925)	<i>t</i> (281)=-0.463, <i>p</i> =.644
Factor 2: Avoidance	1.22 (1.25); 0.0-4.0	1.10 (1.24)	1.37 (1.26)	<i>t</i> (281)=1.743, <i>p</i> =.083
Factor 3: Numbing	0.62 (0.69); 0.0-3.0	0.61 (0.67)	0.63 (0.77)	<i>t</i> (281)=0.217, <i>p</i> =.828
Factor 4: Dysphoric Arousal	1.18 (1.04); 0.0-4.0	1.19 (1.09)	1.16 (0.99)	<i>t</i> (281)=-0.237, <i>p</i> =.813
Factor 5: Anxious Arousal	1.42 (1.14); 0.0-4.0	1.45 (1.16)	1.39 (1.13)	<i>t</i> (281)=-0.439, <i>p</i> =.661

Table 17

Parameter estimates, approximate p values, and goodness-of-fit tests for a nested taxonomy of regression models that describe the relation among program participation, mental health functioning and use, posttraumatic stress factors, and parental sensitivity (Emotional Availability free play task) (N = 135)

	Models					
	M1	M2	M3	M4	M5	M6
Intercept	4.948***	4.989***	5.002***	4.927***	4.882***	4.902***
Program	-0.147	-0.146	-0.154	-0.154	-0.141	-0.133
Traumatic Events	-0.019	0.030	0.031	0.037	0.032	0.032
MH Services	-0.298	-0.322	-0.322	-0.242	-0.261	-0.238
Depression	0.000	0.004	0.004	0.012	0.011	0.011
Reexperiencing		-0.254	-0.204	-0.099	-0.121	-0.104
Avoidance			-0.058	-0.017	-0.023	-0.015
Numbing				-0.392	-0.467	-0.482
Dysphoric					0.121	0.132
Arousal						
Anxious Arousal						-0.041
Rsq	.016	.042	.043	.064	.069	.070
df(Residual)	131	130	129	128	127	126
Change in Rsq		.026	.001	.020	.005	.001

Table 18

Parameter estimates, approximate p values and goodness-of-fit tests for a nested taxonomy of regression models that describe the relation among program participation, mental health functioning and use, posttraumatic stress factors, and parental sensitivity (Emotional Availability teaching task) (N = 130)

	Models					
	M1	M2	M3	M4	M5	M6
Intercept	4.409***	4.424***	4.408***	4.338***	4.341***	4.406***
Program	-0.015	-0.017	-0.007	-0.017	-0.019	0.010
Traumatic Events	-0.002	0.015	0.015	0.022	0.022	0.021
MH Services	-0.059	-0.065	-0.067	0.011	0.013	0.082
Depression	0.003	0.004	0.004	0.011	0.011	0.011
Reexperiencing		-0.089	-0.157	-0.060	-0.058	0.004
Avoidance			-0.080	0.126	0.127	0.152
Numbing				-0.382	-0.377	-0.436
Dysphoric Arousal					-0.009	0.031
Anxious Arousal						-0.135
Rsq	.001	.005	.008	.030	.030	.040
df(Residual)	125	124	123	122	121	120
Change in Rsq		.004	.003	.022	.000	.010

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 19

Parameter estimates, approximate p values and goodness-of-fit tests for a nested taxonomy of regression models that describe the relation among program participation, mental health functioning and use, posttraumatic stress factors, and parental non-hostility (Emotional Availability free play task) (N = 135)

	Models					
	M1	M2	M3	M4	M5	M6
Intercept	4.408***	4.460***	4.459***	4.392***	4.380***	4.368***
Program	-0.290	-0.288*	-0.288	-0.288*	-0.284	-0.289
Traumatic Events	-0.012	0.052	0.052	0.057	0.056	0.056
MH Services	-0.065	-0.095	-0.095	-0.024	-0.029	-0.043
Depression	0.005	0.010	0.010	0.017*	0.017*	0.017*
Reexperiencing		-0.325***	-0.330**	-0.237	0.243	-0.254
Avoidance			0.006	0.043	0.042	0.037
Numbing				-0.349*	-0.369*	-0.358*
Dysphoric Arousal					0.033	0.026
Anxious Arousal						0.024
Rsq	.034	.120**	.120**	.153**	.154**	.154**
df(Residual)	131	130	129	128	127	126
Change in Rsq		.086***	.000	.032*	.001	.001

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 20

Parameter estimates, approximate p values and goodness-of-fit tests for a nested taxonomy of regression models that describe the relation among program participation, mental health functioning and use, posttraumatic stress factors, and parental non-hostility (Emotional Availability teaching task) (N = 130)

	Models					
	M1	M2	M3	M4	M5	M6
Intercept	4.027***	4.039***	4.035***	4.028***	4.040***	4.078***
Program	-0.170	-0.171	-0.168	-0.169	-0.174	-0.157
Traumatic Events	-0.035	0.021	-0.021	0.020	-0.019	-0.019
MH Services	0.138	0.133	0.133	0.140	0.146	0.186
Depression	0.002	0.003	0.003	0.004	0.004	0.004
Reexperiencing		-0.074	-0.094	-0.084	-0.077	-0.042
Avoidance			0.024	0.028	0.030	0.045
Numbing				-0.038	-0.018	-0.052
Dysphoric Arousal					-0.036	-0.013
Anxious Arousal						-0.078
Rsq	.019	.023	.023	.023	.024	.029
df(Residual)	125	124	123	122	121	120
Change in Rsq		.004	.000	.000	.001	.005

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 21

*Correlations between Latent Constructs for the Five Factor Dysphoric Arousal
Posttraumatic Stress Model and Program Utilization Variables*

	Reexperiencing	Avoidance	Numbing	Dysphoric Arousal	Anxious Arousal
Completed Home Visits	-.033	-.117	.067	-.046	-.071
Groups Attended	.006	-.012	.033	-.132	-.106
Completed Secondary Activities	-.123	-.211*	-.087	-.199*	-.169
Duration	-.024	-.159	.088	-.019	-.031

Note. *p<.05. **p<.01. ***p<.001.

References

- Adams, J.A. & East, P.L. (1999). Past physical abuse is significantly correlated with pregnancy as an adolescent. *Journal of Pediatric and Adolescent Gynecology*, 12, 133-138.
- Albus, K.E., West, M.D., & Perez-Smith, A.M. (2004). Associations between youth risk behavior and exposure to violence. *Behavior Modification*, 28, 548-564.
- Almgren, G., Yamashiro, G., & Ferguson, M. (2002). Beyond welfare or work: Teen mothers, household subsistence strategies and child development outcomes. *Journal of Sociology and Social Welfare*, 24, 125-149.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Ammerman, R.T., Putnam, F.W., Altaye, M., Chen, L., Holleb, L.J., Stevens, J., Short, J.A., & Van Ginkel, J.B. (2009). Changes in depressive symptoms in first time mothers in home visitation. *Child Abuse & Neglect*, 33, 127-138.
- Ammerman, R.T., Putnam, F.W., Bosse, N.R., Teeters, A.R., & Van Ginkel, J. (2010). Maternal depression in home visitation: A systematic review. *Aggression and Violent Behavior*, 15, 191-200.
- Ammerman, R.T., Putnam, F.W., Chard, K.M., Stevens, J., & Van Ginkel, J.B. (2011, March 28). PTSD in depressed mothers in home visitation.

Psychological Trauma: Theory, Research, Practice, and Policy. Advanced online publication. doi: 10.1037/a0023062

Ammerman, R. T., Shenk, C. E., Teeters, A. R., Noll, J. G., Putnam, F. W., & Van Ginkel, J. D. (2011). Impact of depression and childhood trauma in mothers receiving home visitation. *Journal of Child and Family Studies*.doi: 10.1007/s10826-011-9513-9.

Ammerman, R.T., Stevens, J., Putnam, F.W., Altaye, M., Hulsmann, J.E., Lehmkuhl, H.D., Monroe, J.C., Gannon, T.A., & Van Ginkel, J.B. (2006). Predictors of early engagement in home visitation. *Journal of Family Violence, 21*, 105-115.

Anthony, J. L., Lonigan, C. J., & Hecht, S. A. (1999). Dimensionality of posttraumatic stress disorder symptoms in children exposed to disaster: Results from confirmatory factor analyses. *Journal of Abnormal Psychology, 108*, 326-336.

Anthony, J. L., Lonigan, C. J., Vernberg, E. M., La Greca, A. M., Silverman, W. K., & Prinstein, M. J. (2005). Multisample cross-validation of a model of childhood posttraumatic stress disorder symptomatology. *Journal of Traumatic Stress, 18*, 667-676.

Appleyard, K. & Osofsky, J.D. (2003). Parenting after trauma: Supporting parents and caregivers in the treatment of children impacted by violence. *Infant Mental Health Journal, 24*, 111-125.

Armour, C., Elhai, J. D., Richardson, D., Ractliffe, K., Wang, L., & Elkitt, A. (2012). Assessing a five factor model of PTSD: Is dysphoric arousal a

unique PTSD construct showing differential relationships with anxiety and depression? *Journal of Anxiety Disorders*, 26, 368-376.

Armour, C., Layne, C. M., Naifeh, J. A., Shevlin, M., Durakovic-Belko, N. D., Pynoos, R. S., & Elhai, J. D. (2011). Assessing the factor structure of posttraumatic stress disorder symptoms in war-exposed youth with and without Criterion A2 endorsement. *Journal of Anxiety Disorders*, 25, 80-87.

Asmundson, G. J. G., Frombach, I., McQuaid, J., Pedrelli, P., Lenox, R., & Stein, M. B. (2000). Dimensionality of posttraumatic stress symptoms: A confirmatory factor analysis of DSM-IV symptoms clusters and other symptom models. *Behaviour Research and Therapy*, 38, 203-214.

Asmundson, G. J. G., Stapleton, J. A., & Taylor, S. (2004). Are avoidance and numbing distinct PTSD symptom clusters? *Journal of Traumatic Stress*, 17, 467-475.

Asmundson, G. J. G., Stein, M. B., & McCreary, D. R. (2002). Posttraumatic stress disorder symptoms influence health status of deployed peacekeepers and nondeployed military personnel. *Journal of Nervous and Mental Disorders*, 190, 807-815.

Asmundson, G. J. G., Wright, K. D., McCreary, D. R., & Pedlar, D. (2003). Post-traumatic stress disorder symptoms in United Nations peacekeepers: An examination of factor structure in peacekeepers with and without chronic pain. *Cognitive Behaviour Therapy*, 32, 26-37.

- Astuto, J. & Allen, L. (2009). Home visitation and young children: An approach worth investing in? *Social Policy Report*, 23, 3-23.
- Ayer, L. A., Cisler, J. M., Danielson, C. K., Amstadter, A. B., Saunders, B. E., & Kilpatrick, D. G. (2011). Adolescent posttraumatic stress disorder: An examination of factor structure reliability in two national samples. *Journal of Anxiety Disorders*, 25, 411-421.
- Bailey, H.N., Moran, G., & Pederson, D.R. (2007). Childhood maltreatment, complex trauma symptoms, and unresolved attachment in an at-risk sample of adolescent mothers. *Attachment & Human Development*, 9(2), 139-161.
- Banyard, V.L., Williams, L.M., & Siegel, J.A. (2003). The impact of complex trauma and depression on parenting: An exploration of mediating risk and protective factors. *Child Maltreatment*, 8, 334-349.
- Barlow, D. H. (1988). *Anxiety and its disorders*. New York: The Guilford Press.
- 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.
- Barnet, B, Liu, J. & DeVoe, M. (2008). Double jeopardy: Depressive symptoms and rapid subsequent pregnancy in adolescent mothers. *Archives of Pediatric and Adolescent Medicine*, 162, 246-252.

- Beers, L. A. S., & Hollo, R. E. (2009). Approaching the adolescent-headed family: A review of teen parenting. *Current Problems in Pediatric and Adolescent Health Care*, 39, 216-233.
- Belsky, J., Conger, R., & Capaldi, D.M. (2009). The intergenerational transmission of parenting: Introduction to the special edition. *Child Development*, 45, 1201-1204.
- Berenson, Wiemann, & McCombs (2001). Exposure to violence and associated health-risk behaviors among adolescent girls. *Archives of Pediatric and Adolescent Medicine*, 155, 1238-1242.
- Bert, S.C., Guner, B.M., & Lanzi, R.G. (2009). The influence of maternal history of abuse on parenting knowledge and behavior. *Family Relations*, 58, 176-187.
- Biello, K. B., Sipsma, H. L., & Kershaw, T. (2010). Effect of teenage parenthood on mental health trajectories: Does sex matter? *American Journal of Epidemiology*, 172, 279-287.
- Biringen, Z. (2000). Emotional Availability: Conceptualization and research findings. *American Journal of Orthopsychiatry*, 70, 104-114.
- Biringen, Z., Robinson, J., & Emde, R.N. (1993). *Manual for coding Emotional Availability scales* (2nd ed.). Fort Collins, CO: Colorado State University.
- Biringen, Z., Robinson, J., & Emde, R.N. (1998). *Manual for coding Emotional Availability scales* (3rd ed.). Fort Collins, CO: Colorado State University.

- Birkeland, R., Thompson, K., & Phares, V. (2005). Adolescent motherhood and postpartum depression. *Journal of Clinical Child & Adolescent Psychology, 34*, 292-300.
- Black, M.M., Papas, M.A., Hussey, J.M., Dubowitz, H., Kotch, J.B., & Starr, R.H. (2002). Behavior problems among preschool children born to adolescent mothers: Effects of maternal depression and perceptions of partner relationships. *Journal of Clinical Child and Adolescent Psychology, 31*, 16-26.
- Bleil, M. E., Adler, N. E., Pasch, L. A., Sternfeld, B., Reijo-Pera, R. A., & Cedars, M. I. (2011). Adverse childhood experiences and repeat induced abortion. *American Journal of Obstetrics & Gynecology, 204*, 122 e1-6.
- Borkowski, J. G., Bisconti, T., Willard, C. C., & Keogh, D. A. (2002). The adolescent parent: Influences on children's intellectual, academic, and socioemotional development. In J. G. Borkowski, S. L. Ramey, & M. Bristol-Power (Eds.), *Parenting and the child's world: Influences on academic, intellectual, and social-emotional development* (pp. 161-184). Mahwah, NJ: Lawrence Erlbaum Associates.
- Borkowski, J. G., Whitman, T. L., & Farris, J. R. (2007). Adolescent mothers and their children: Risks, resilience, and development. In J. G. Borkowski, J. R. Farris, T. L. Whitman, S. S. Carothers, K. Weed, & D. A., Keogh (Eds.), *Risk and resilience: Adolescent mothers and their children grow up* (pp. 1-34). Mahwah, NJ: Lawrence Erlbaum Associates.

- Bornovalova, M. A., Gwadz, M. A., Kahler, C., Aklin, W. M., & Lejuez, C. W. (2008). Sensation seeking and risk-taking propensity as mediators in the relationship between childhood abuse and HIV-related risk behavior. *Child Abuse & Neglect*, 32, 99-109.
- Bosquet Enlow, M., Kitts, R. L., Blood, E., Bizarro, A., Hofmeister, M., & Wright, R. (2011). Maternal posttraumatic stress symptoms and infant emotional reactivity and emotion regulation. *Infant Behavior and Development*, 34, 487-503.
- Boyer, D., & Fine, D. (1992). Sexual abuse as a factor in adolescent pregnancy and child maltreatment. *Family Planning Perspectives*, 24(1), 4-11.
- Briere, J. & Spinazzola, J. (2009). Assessment of the sequelae of complex trauma: Evidence-based measures. In C.A. Courtois & J.D. Ford (Eds.). *Treating complex traumatic stress disorders: An evidence-based guide* (pp. 104-123). New York: Guildford Press.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks: Sage Publications.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York: Guilford Press.
- Browne, A. & Bassuk, S.S. (1997). Intimate violence in the loves of homeless and poor housed women: Prevalence and patterns in an ethnically diverse sample. *American Journal of Orthopsychiatry*, 67(2), 267-278.

- Buka, S.L., Stichick, T.L., Birdthistle, I., & Earls, F.J. (2001). Youth exposure to violence: Prevalence, risks, and consequences. *American Journal of Orthopsychiatry*, 71, 298-310.
- Butler, J. R., & Burton, L. M. (1990). Rethinking teenage childbearing: Is sexual abuse a missing link? *Family Relations: Journal of Applied Family & Child Studies*, 39(1), 73-80.
- Caldwell, C.H., Antonucci, T.C., Jackson, J.S., Wolford, M.L., & Osofsky, J.D. (1997). Perceptions of parental support and depressive symptomatology among Black and White adolescent mothers. *Journal of Emotional and Behavioral Disorders*, 5, 173-183.
- Campbell, S.B. & Cohn, J.F. (1991). Prevalence and correlates of postpartum depression in first-time mothers. *Journal of Abnormal Psychology*, 100, 594-599.
- Carpenter, G. L. & Sacks, A. M. (2009). Developmental effect of exposure to Intimate Partner Violence in early childhood: A review of the literature. *Children and Youth Services Review*, 31, 831-839.
- Cauffman, E., Feldman, S., Waterman, J., & Steiner, H. (1998). Posttraumatic stress disorder among female juvenile offenders. *American Academy of Child and Adolescent Psychiatry*, 37, 1209-1217.
- Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Adolescent and School Health; Health Resources and Services Administration, Maternal and Child Health Bureau, Office of Adolescent Health; National Adolescent

Health Information Center, University of California, San Francisco

(2004). *Improving the Health of Adolescents and Young Adults: A Guide for States and Communities*. GA: Centers for Disease Control.

Chaudhuri, J. H., Easterbrooks, M. A. & Davis, C. R. (2009). The relation between emotional availability and parenting style: Cultural and economic factors in a diverse sample of young mothers. *Parenting: Science and Practice, 9*, 277-299.

Chemtob, C. M., Madam, A., Berger, P., & Abramovitz, R. (2011). Adolescent exposure to the World Trade Center attacks, PTSD symptomatology, and suicidal ideation. *Journal of Traumatic Stress, 24*, 526-529.

Cohen, L.R., Hien, D.A., & Batchelder, S. (2008). The impact of cumulative maternal trauma and diagnosis on parenting behavior. *Child Maltreatment, 13*, 27-38.

Coley, R.L. & Chase-Landsdale, P.L. (1998). Adolescent pregnancy and parenthood: Recent evidence and future directions. *American Psychologist, 53*, 152-166.

Cort, N. A., Toth, S. L., Cerulli, C., & Rogosch, F. (2011). Maternal intergenerational transmission of childhood multitype maltreatment. *Journal of Aggression, Maltreatment, & Trauma, 20*, 20-39.

Cummings, E.M., Davies, P.T., & Campbell, S.B. (2000). *Developmental psychopathology and family process: Theory, research, and clinical implications*. New York: Guilford Press.

- Dahinten, V. S., Shapka, J. D., & Willms, J. D. (2007). Adolescent children of adolescent mothers: The impact of family functioning on trajectories of development. *Journal of Youth and Adolescence*, 36, 195-212.
- Damashek, A., Doughty, D., Ware, L., & Silovsky, J. (2011). Predictors of client engagement and attrition in home-based child maltreatment prevention services. *Child Maltreatment*, 16, 9-20.
- Davidson, J. (2001). Recognition and treatment of Posttraumatic Stress Disorder. *Journal of the American Medical Association*, 286, 584-588.
- de Paul, J., & Domenech, L. (2000). Childhood history of abuse and child abuse potential in adolescent mothers: A longitudinal study. *Child Abuse & Neglect*, 24(5), 701-713.
- Deal, L.W. & Holt, V.L. (1998). Young maternal age and depressive symptoms: results from the 1998 National Maternal and Infant Health Survey. *American Journal of Public Health*, 88, 266-270.
- Demers, I., Berneier, A., Tarabulsy, G. M., & Provost, M. A. (2010). Maternal and child characteristics as antecedents of maternal mind-mindedness. *Infant Mental Health Journal*, 31, 94-112.
- DiLillo, D. & Damashek, A. (2003). Parenting characteristics of women reporting a history of childhood sexual abuse. *Child Maltreatment*, 8, 319-333.
- Dixon, A., Howie, P., & Straling, J. (2005). Trauma exposure, Posttraumatic stress, and psychiatric comorbidity in female juvenile offenders. *Journal*

of the American Academy of Child and Adolescent Psychiatry, 44, 798-806.

Dixon, L., Browne, K., & Hamilton-Giachritsis, C. (2005). Risk factors of parents abused as children: A mediational analysis of the intergenerational continuity of child maltreatment. *Journal of Child Psychology and Psychiatry*, 46, 47-57.

Donelan-McCall, N., Eckenrode, J., & Olds, D. L. (2009). Home visiting for the prevention of child maltreatment: Lessons learned during the past 20 years. *Pediatric Clinics of North America*, 56, 389-403.

Driscoll, J. R. & Easterbrooks, M. A. (2007). Young mothers' play with their toddlers: Individual variability as a function of psychosocial factors. *Infant and Child Development*, 16, 649-670.

Duggan, A., Berlin, L. J., Cassidy, J., Burrell, L., & Tandon, S. D. (2009). Examining maternal depression and attachment insecurity as moderators of the impacts of home visiting for at-risk mothers and infants. *Journal of Consulting and Clinical Psychology*, 77, 788-799.

Duggan, A., Windham, A., McFarlane, E., Fuddy, L., Rohde, C., Buchbinder, S., & Sia, C. (2000). Hawaii's Healthy Start Program of home visiting for at-risk families: Evaluation of family identification, family engagement and service delivery. *Pediatrics*, 105, 205-259.

Dukewich, T. L., Borkowski, J. G., & Whitman, T. L. (1996). Adolescent mothers and child abuse potential: An evaluation of risk factors. *Child Abuse & Neglect*, 20, 1031-1047.

- East, P. L., Matthews, K. L., & Felice, M. E. (1994). Qualities of adolescent mothers' parenting. *Journal of Adolescent Health, 15*, 163-168.
- Easterbrooks, M. A. & Biringen, Z. (2005). The Emotional Availability Scales: Methodological refinements of the construct and clinical implication related to gender and at-risk interactions. *Infant Mental Health Journal, 26*, 291-294.
- Easterbrooks, M. A., Chaudhuri, J. H. & Gestsdottir, S. (2005). Patterns of emotional availability among young mothers and their infants: A dyadic, contextual analysis. *Infant Mental Health Journal, 26*, 309-326.
- Easterbrooks, M. A., Chaudhuri, J. H., Bartlett, J. D., & Copeman, A. (2011). Resilience in parenting among young mothers: Family and ecological risks and opportunities. *Children and Youth Services Review, 33*, 42-50.
- Easterbrooks, M.A., Biesecker, G., & Lyons-Ruth, K. (2000). Infancy predictors of emotional availability in middle childhood: The roles of attachment security and maternal depressive symptomatology. *Attachment and Human Development, 2*, 170-187.
- Elhai, J. D., & Palmieri, P. A. (2011). The factor structure of posttraumatic stress disorder: A literature update, critique of methodology, and agenda for future research. *Journal of Anxiety Disorders, 25*, 849-854.
- Elhai, J. D., Biehn, T. L., Armour, C., Klopper, J. J., Frueh, B. C., & Pamieri, P. A. (2011). Evidence for a unique PTSD construct represented by PTSD's D1-D3 symptoms. *Journal of Anxiety Disorders, 25*, 340-345.

- Elhai, J. D., Engdahl, R. M., Palmieri, P. A., Naifeh, J. A., Schweinle, A., & Jacobs, G. A. (2009). Assessing posttraumatic stress disorder with or without reference to a single worst traumatic event: Examining differences in factor structure. *Psychological Assessment, 21*, 629-634.
- Elhai, J. D., Ford, J. D., Ruggiero, K. J., & Frueh, B. C. (2009). Diagnostic alterations for post-traumatic stress disorder: Examining data from the National Comorbidity Survey Replication and National Survey of Adolescents. *Psychological Medicine, 39*, 1957-1966.
- Elhai, J. D., Gray, M. J., Docherty, A. R., Kashdan, T. B., & Kose, S. (2007). Structural validity of the Posttraumatic Stress Disorder Checklist among college students with a trauma history. *Journal of Interpersonal Violence, 22*, 1471-1478.
- Elhai, J. D., Miller, M. E., Ford, J. D., Biehn, T. L., Palmieri, P. A., & Frueh, B. C. (2012). Posttraumatic stress disorder in DSM-5: Estimates of prevalence and symptoms structure in a nonclinical sample of college students. *Journal of Anxiety Disorders, 26*, 58-64.
- Ellis, B. H., Lhewa, D., Charney, M., & Cabral, H. (2006). Screening for PTSD among Somali adolescent refugees: Psychometric properties of the UCLA PTSD Index. *Journal of Traumatic Stress, 19*, 547-551.
- Emde, R. N. (1980). Emotional availability: A reciprocal reward system for infants and parents with implications for prevention of psychosocial disorders. In P. M. Taylor (Ed.), *Parent-infant relationships* (pp. 87-115). Orlando, FL: Grune & Stratton.

- Fallon, B., Ma, J., Black, T., & Wekerle, C. (2011). Characteristics of young parents investigated and opened for ongoing services in child welfare. *International Journal of Mental Health and Addiction*, 9, 365-381.
- Fitzgerald, M.M., Shipman, K.L., Jackson, J.L., McMahon, R.J., & Hanley, H.M. (2005). Perceptions of parenting versus parent-child interactions among incest survivors. *Child Abuse & Neglect*, 29, 661-681.
- Foa, E. B., Keane, T. M., & Friedman, M. J. (2000). Introduction. In E. B. Foa, T. M. Keane, & M. J. Friedman (Eds.). *Effective treatments of PTSD* (pp. 1-18). New York: Guilford Press.
- Foa, E., Zinbarg, R., & Rothbaum, B. (1992). Uncontrollability and unpredictability in post-traumatic stress disorder: An animal model. *Psychological Bulletin*, 112, 218-238.
- Forbes, D., Lockwood, E., Elhai, J. D., Creamer, M., O'Donnell, M., Bryant, R., McFarlane, A., & Silove, D. (2011). An examination of the structure of posttraumatic stress disorder in relation to the anxiety and depressive disorders. *Journal of Affective Disorders*, 132, 165-172.
- Ford, J. D. & Courtois, C. A. (2009). Defining and understanding complex trauma and complex traumatic stress disorders. In C. A. Courtois & J. D. Ford (Eds.). *Treating complex traumatic stress disorders: An evidence-based guide* (pp. 13-30). New York: Guildford Press.
- Fowler, P. J., Tompsett, C. J., Braciszewski, J. M., Jacques-Tiura, A. J., & Baltes, B. B. (2009). Community violence: A meta-analysis on the effect of

exposure and mental health outcomes of children and adolescents.

Development and Psychopathology, 21, 227-259.

Furstenberg, F.F. (2007). *Destinies of the disadvantaged: The politics of teen childbearing*. New York: Russell Sage Foundation.

Galano, J. (2007). The challenges of integrating research into practice. *Journal of Prevention & Intervention in the Community*, 34, 1-11.

Galano, J. & Schellenbach, C. J. (2007). Healthy Families America research practice network. *Journal of Prevention & Intervention in the Community*, 34, 39-66.

Gandoli, D. M. (1999). Adolescent development and health. In T.L. Whitman, T.V. Merluzzi, & R.D. White (Eds.), *Life span perspectives on health and illness*. (pp. 147-164). NJ: Erlbaum.

Garrido, E. F., Culhane, S. E., Raviv, T., & Taussig, H. N. (2010). Does community violence exposure predict trauma symptoms in a sample of maltreated youth in foster care? *Violence and Victims*, 25, 755-769.

Gavin, A. R., Lindhorst, T., & Lohr, M. J. (2011). The prevalence and correlates of depressive symptoms among adolescent mothers: Results from a 17-year longitudinal study. *Women & Health*, 51, 525-545.

Gavrilovic, J. J., Schutzwohl, M., Fazel, M., & Priebe, S. (2005). Who seeks treatment after a traumatic event and who does not? A review of findings on mental health utilization. *Journal of Traumatic Stress*, 18, 595-605.

George, R. M., Harden, A., & Lee, B. J. (2008). Consequences of teen childbearing for child abuse, neglect, and foster care placement. In S. D.

- Hoffman & R. A. Maynard (Eds.), *Kids having kids: Economic costs and social consequences of teen pregnancy* (pp. 257-288). Washington, DC: The Urban Institute Press.
- Giaconia, R., Reinherz, H.Z., Silverman, A.B., Pakiz, B., Frost, A.K., & Cohen, E. (1995). Traumas and Posttraumatic stress disorder in a community population of older adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34, 1369-1380.
- Goerge, R. M., & Lee, B. J. (1997). Abuse and neglect of children. In R. A. Maynard (Ed.), *Kids having kids: Economic costs and social consequences of teen pregnancy* (pp. 205-230). Washington, DC: The Urban Institute Press.
- Guttmacher Institute (2010). U.S. Teenage pregnancies, births and abortions: National and state trends and trends by race and ethnicity. Retrieved from <http://www.guttmacher.org/pubs/USTPtrends.pdf>.
- Hairston, I. S., Waxler, E., Seng, J. S., Fezzey, A. G., Rosenblum, K. L., & Muzik, M. (2011). The role of infant sleep in intergenerational transmission of trauma. *Sleep*, 34, 1373-1383.
- Hall, B. J., Elhai, J. D., Grubaugh, A., Tuerk, P., & Magruder, K. (2012). Examining the factor structure of PTSD between male and female veterans in primary care. *Journal of Anxiety Disorders*, 26, 409-415.
- Hans, S. L. & Thullen, M. J. (2009). The relational context of adolescent motherhood. In C. H. Zeanah (Ed.), *Handbook of infant mental health* (pp. 214-229). New York, NY: Guilford Press.

- Harden, B.J. (2010). Home visitation with psychologically vulnerable families: Developments in the profession and in the professional. *Zero to Three*, 44-51.
- Harding, K., Galano, J., Martin, J., Huntington, L., & Schellenbach, C. J. (2007). Healthy Families America effectiveness: A comprehensive review of outcomes. *Journal of Prevention and Intervention in the Community*, 34, 149-179.
- Harvey, M. (1996). An ecological view of psychological trauma. *Journal of Traumatic Stress*, 9, 3-23.
- Hebbeler, K.M. & Gerlach-Downie, S.G. (2002). Inside the black box of home visiting: A qualitative analysis of why intended outcomes were not achieved. *Early Childhood Research Quarterly*, 17, 28-51.
- Herman (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of Traumatic Stress*, 5, 377-391.
- Herman (1997). *Trauma and recovery*. New York: Basic Books.
- Herrenkohl, E.C., Herrenkohl, R.C., Egolf, B.P., & Russo, M.J. (1998). The relationship between early maltreatment and teenage parenthood. *Journal of Adolescence*, 21, 291-303.
- Hess, C. R., Papas, M. A., & Black, M. M. (2002). Resilience among African American mothers: Predictors of positive parenting in early infancy. *Journal of Pediatric Psychology*, 27, 619-629.

- Hodgkinson, S. C., Colantuoni, E., Roberts, D., Berg-Cross, L., & Belcher, H. M. E. (2010). Depressive symptoms and birth outcomes among pregnant teenagers. *Journal of Pediatric and Adolescent Gynecology*, 23, 16-22.
- Horowitz, K., Weine, S., & Jekel, J. (1995). PTSD symptoms in urban adolescent girls: Compounded community trauma. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34(10), 1353-1361.
- Howard, K. S. & Brooks-Gunn, J. (2009). The role of home visiting programs in preventing child abuse and neglect. *The Future of Children*, 19, 119-146.
- Hu, L. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1-55.
- Jöreskog, K., & Sörbom, D. (1996). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.
- Kearney, C. A., Wechsler, A., Kaur, H., & Lemos-Miller, A. (2010). Posttraumatic stress disorder in maltreated youth: A review of contemporary research and thought. *Clinical Child and Family Psychology Review*, 13, 46-76.
- Kennedy, A. C. (2007). Homelessness, violence exposure, and school participation among urban adolescent mothers. *Journal of Community Psychology*, 35(5), 639-654.
- Kennedy, A.C. & Bennett, L. (2006). Urban adolescent mothers exposed to community, family, and partner violence: Is cumulative violence

- exposure a barrier to school performance and participation? *Journal of Interpersonal Violence*, 21, 750-773.
- Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of twelve-month DSM-IV disorders in the National Comorbidity Survey Replication (NCS-R). *Archives of General Psychiatry*, 62, 617-627.
- King, D.K. (1988). Multiple jeopardy, multiple consciousness: The context of a black feminist ideology. *Signs*, 14 (1), 42-72.
- King, D. W., Leskin, G. A., King, L. A., & Weathers, F. W. (1998). Confirmatory factor analysis of the clinician-administered PTSD scale: Evidence for the dimensionality of Posttraumatic Stress Disorder. *Psychological Assessment*, 10, 90-96.
- Klein, J. D. (2005). Adolescent pregnancy: Current trends and issues. *Pediatrics*, 116, 281-285.
- Koenen, K. C., Goodwin, R., Struening, E., Hellman, F., & Guardino, M. (2004). Posttraumatic stress disorder and treatment seeking in a national screening sample. *Journal of Traumatic Stress*, 16, 5-16.
- Koniak-Griffin, D. & Lesser, Janna (1996). The impact of childhood maltreatment on young mothers' violent behavior toward themselves and others. *Journal of Pediatric Nursing*, 11(5), 300-308.
- Krysik, J., Lecroy, C. W., Ashford, J.B. (2008). Participants' perception of healthy families: A home visitation program to prevent child abuse and neglect. *Children and Youth Services Review*, 30, 45-61.

- Kuramoto, S. J., Brent, D. A., & Wilcox, H. C. (2009). The impact of parental suicide on child and adolescent offspring. *Suicide and Life-Threatening Behavior, 39*, 137-151.
- Lang, A. J., Gartstein, M. A., Rodgers, C. S., & Ledbeck, M. M. (2010). The impact of maternal childhood abuse on parenting and infant temperament. *Journal of Child and Adolescent Psychiatric Nursing, 23*, 100-110.
- Lansford, J.E., Miller-Johnson, S., Berlin, L.J., Dodge, K.A., Bates, J.E., & Pettit, G.S. (2007). Early physical abuse and later violent delinquency: A prospective longitudinal study. *Child Maltreatment, 12*, 233-245.
- Larrieu, J.A., Heller, S.S., Smyke, A.T., & Zeanah, C. (2008). Predictors of permanent loss of custody for mothers of infants and toddlers in foster care. *Infant Mental Health Journal, 29* (1), 48-60.
- Larson, N. C. (2004). Parenting stress among adolescent mothers in the transition to adulthood. *Child and Adolescent Social Work Journal, 21*, 457-476.
- Layne, C. M., Olsen, J. A., Baker, A., Legerski, J.-P., Isakson, B., Pasalic, A., et al. (2010). Unpacking trauma exposure risk factors and differential pathways of influence: Predicting post-war mental distress in Bosnian adolescents. *Child Development, 81*, 1053–1076.
- Leadbeater, B. J., Bishop, S. J., & Raver, C. C. (1996). Quality of mother-toddler interactions, maternal depressive symptoms, and behavior problems in preschoolers of adolescent mothers. *Developmental Psychology, 32*, 280-288.

- Leaman, S.C. & Gee, C.B. (2008). Intimate partner violence among adolescent and young adult mothers. *Journal of Family Violence*, 23, 519-528.
- Lee, B. J. & Goerge, R. M. (1999). Poverty, early childbearing, and child maltreatment: A multinomial analysis. *Children and Youth Services*, 21, 755-780.
- Leis, J.A., Mendelson, T., Perry, D.F., & Tandon, D. (2011). Perception of mental health services among low-income, perinatal African American women. *Women's Health Issues*, 21, 314-319.
- Lerner, R. M. (2002). *Concepts and Theories of Human Development* (3 ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Lesser, J. & Koniak-Griffin, D. (2000). The impact of physical or sexual abuse on chronic depression in adolescent mothers. *Journal of Pediatric Nursing*, 15(6), 378-387.
- Lesser, J., Koniak-Griffin, D., Gonzalez-Figueroa, E., Huang, R., & Cumberland, W.G. (2007). Childhood abuse history and risk behaviors among teen parents in a culturally rooted, couple-focused HIV prevention program. *Journal of the Association of Nurses in AIDS Care*, 18(2), 18-27.
- LeTourneau, N. L., Stewart, M. J., & Barnfather, A. K. (2004). Adolescent mothers: Support needs, resources, and support-education interventions. *Journal of Adolescent Health*, 35, 509-525.
- Levine, J. A., Pollack, H., & Comfort, M. E. (2001). Academic and behavioral outcomes among the children of young mothers. *Journal of Marriage and Family*, 63, 355-369.

- Linning, L.M. & Kearney, C.A. (2004). Posttraumatic Stress Disorder in maltreated youth: A study of diagnostic comorbidity and child factors. *Journal of Interpersonal Violence, 19*, 1087-1101.
- Lippman, A.D.P., (2010). The current status and impact of US national policy on the help-seeking behavior of adolescents. *Children and Youth Services Review, 32*, 822-828.
- Lipschitz, D.S., Rasmussen, A.M., Anyan, W., Cromwell, P., & Southwick, S.M. (2000). Clinical and functional correlates of posttraumatic stress disorder in urban adolescent girls at a primary care clinic. *Journal of the American Academy of Child and Adolescent Psychiatry, 39*, 1104-1111.
- Litz, B. T. (1992). Emotional numbing in combat-related post-traumatic stress disorder: A critical review and reformulation. *Clinical Psychology review, 12*, 417-432.
- Litz, B. T., Schlenger, W. E., Weathers, F. W., Caddell, J. M., Fairbank, J. A., & LaVange, L. M. (1997). Predictors of emotional numbing in posttraumatic stress disorder. *Journal of Traumatic Stress, 10*, 607-618.
- Low, L.K., Martin, K., Sampsel, C., Guthrie, B., & Oakley, D. (2003). Adolescents' experiences of childbirth: Contrasts with adults. *Journal of Midwifery and Women's Health, 48*(3), 192-198.
- Luster, T. & Brophy-Herb, H. (2000). Adolescent mothers and their children. In J. D. Osofsky & H. E. Fitzgerald (Eds.). *WAIMH Handbook of infant mental health: Infant mental health in groups at high risk* (Volume 4, 369-414). New York: Wiley & Sons, Inc.

- Macy, R. D., Barry, S., & Noam, G. G. (2003). Threat and trauma: An overview. *New Directions for Youth Development*, 98, 11-28.
- MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. New York: Lawrence Erlbaum.
- Mapp, S. C. (2006). The effects of sexual abuse as a child on the risk of mothers physically abusing their children: A path analysis using systems theory. *Child Abuse & Neglect*, 30, 1293-1310.
- Martin, S. L., Clark, K. A., Lynch, S. R., Kupper L. L., & Cilenti, D. (1999). Violence in the lives of pregnant teenage women: Associations with multiple substance use. *American Journal of Drug and Alcohol Abuse*, 25(3), 425-440.
- Mayers, H. A. (2005). Treatment of a traumatized adolescent mothers and her two-year old son. *Clinical Social Work Journal*. 33(4), 419-43.
- McCart, M. R., Smith, D., & Sawyer, G. K. (2010). Help seeking among victims of crime: A review of the empirical literature. *Journal of Traumatic Stress*, 2, 198-206.
- McGraw, K. O. & Wong, S. P. (1996). Forming inferences about some intraclass correlation coefficients. *Psychological Methods*, 1, 30-46.
- McKay, M. M., Lynn, C. J., & Bannon, W. M. (2005). Understanding inner city child mental health need and trauma exposure: Implication for preparing urban service providers. *American Journal of Orthopsychiatry*, 75, 201-210.

- Meade, C. S., Kershaw, T. S., Ickovics, J. R. (2008). The intergenerational cycle of teenage motherhood: An ecological approach. *Health Psychology, 27*, 419-429.
- Mersky, J. P., Berger, L. M., Reynolds, A. J., & Gromoske, A. N. (2009). Risk factors for child and adolescent maltreatment: A longitudinal investigation of a cohort of inner-city youth. *Child Maltreatment, 14*, 73-88.
- Meyers, S.A. & Battistoni, J. (2003). Proximal and distal correlates of adolescent mothers' parenting attitudes. *Applied Developmental Psychology, 24*, 33-49.
- Miele, D. & O'Brien, E.J. (2010). Underdiagnosis of Posttraumatic Stress Disorder in at risk youth. *Journal of Traumatic Stress, 23*, 591-598.
- Milan, S., Ickovics, J.R., Kershaw, T., Lewis, J., Meade, C., & Ethier, K. (2004). Prevalence, course, and predictors of emotional distress in pregnant and parenting adolescents. *Journal of Counseling and Clinical Psychology, 72*(2), 328-340.
- Miller, M. W., Wolf, E. J., Harrington, K. M., Brown, T. A., Kaloupek, D. G., & Keane, T. M. (2010). An evaluation of competing models for the structure of PTSD symptoms using external measures of comorbidity. *Journal of Traumatic Stress, 23*, 631-638.
- Miller-Johnson, S., Winn, D-M, Coie, J., Maumary-Gremaud, A., Hyman, C., Terry, R., & Lochman, J. (1999). Motherhood during the teen years: A developmental perspective on risk factors for childbearing. *Development and Psychopathology, 11*, 85-100.

- Mitchell, S.J., Lewin, A., Horn, I.B., Valentine, D., Sanders-Phillips, K., & Joseph, J. (2009). How does violence exposure affect the psychological health and parenting of young African American mothers? *Social Science & Medicine*, doi: 10.1016/j.socscimed.2009.10.048
- Moehler, E., Biringen, Z., & Poustka, L. (2007). Emotional availability in a sample of mothers with a history of abuse. *American Journal of Orthopsychiatry*, 77(4), 624-628.
- Mollborn, S. & Morningstar, E. (2009). Investigating the Relationship between Depression and Teenage Childbearing Using Longitudinal Evidence. *Journal of Health and Social Behavior*, 50(3), 310-326.
- Moore, D. R. & Florshiem, P. (2008). Interpartner conflict and child abuse risk among African American and Latino adolescent parenting couples. *Child Abuse & Neglect*, 32, 463-475.
- Moore, M.R. & Brooks-Gunn, J. (2002). Adolescent parenthood. In M. Bornsteing (Ed.), *Handbook of parenting: Being and becoming a parent* (Volume 3, 173-214). Mahwah, NJ: Erlbaum.
- Mylant, M. & Mann, C. (2008). Current sexual trauma among high-risk teen mothers. *Journal of Child and Adolescent Psychiatric Nursing*, 21(3), 164-176.
- Narang, D.S. & Contreras, J.M. (2005). The relationships of dissociation and affective family environment with the intergenerational cycle of child abuse. *Child Abuse & Neglect*, 29, 683-699.

- Nemeroff, C. B., Heim, C. M., Thase, M. E., Klein, D.N., Rush, A. J., Schatzberg, A. F., et al. (2003). Differential responses to psychotherapy versus pharmacology in patients with chronic forms of major depression and childhood trauma. *The National Academy of Sciences, 100*, 14293–14296.
- New, M. & Berliner, L. (2000). Mental health service utilization by victims of crime. *Journal of Traumatic Stress, 13*, 693-707.
- Nievar, M. A., Van Egeren, L. A., & Pollard, S. (2010). A meta-analysis of home visiting programs: Moderators of improvements in maternal behavior. *Infant Mental Health Journal, 31*, 499-520.
- Noll, J. G., Trickett, P. K., Harris, W. W., & Putnam, F. W. (2009). The cumulative burden borne by offspring whose mothers were sexually abused as children: Descriptive results from a multigenerational study. *Journal of Interpersonal Violence, 24*, 424-449
- Noria, C. W., Weed, K., & Keogh, D. A. (2007). The fate of adolescent mothers. In J. G. Borkowski, J. R. Farris, T. L. Whitman, S. S. Carothers, K. Weed, & D. A. Keogh (Eds.), *Risk and resilience: Adolescent mothers and their children grow up* (pp. 35-68). Mahwah, NJ: Lawrence Erlbaum.
- Nygaard, E., Jensen, T. K., & Dyb, G. (2012). Stability of posttraumatic stress reaction factors and their relation to general mental health problems in children: A longitudinal study. *Journal of Clinical Child & Adolescent Psychology, 41*, 15-26.

- Olds, D.L., Robinson, J., Pettitt, L., Luckey, D.W., Holmberg, J., Ng, R.K., Isacks, K., Sheff, K., & Henderson, Jr., C.R. (2004). Effects of home visits by paraprofessionals and by nurses: Age 4 follow-up results of a randomized trial. *Pediatrics*, 114, 1560-1568.
- Ornduff, S. R., Kelsey, R. M., Bursi, C., Alpert, B. S., & Bada, H. S. (2002). Child abuse potential in at-risk Africa American mothers: The role of life experience variables. *American Journal of Orthopsychiatry*, 72, 433-444.
- Oz, S. & Fine, M. (1988). A comparison of childhood backgrounds of teenage mothers and their non-mother peers: A new formulation. *Journal of Adolescence*, 11, 251-261.
- Osofsky, J.D., Hann, D.A., & Peebles, C. (1993). Adolescent parenthood: Risks and opportunities for mothers and infants. In C.H. Zeanah (Ed.), *Handbook of infant mental health* (pp. 106-119), New York: Guilford.
- Parrish, J.W., Young, M. B., Perham-Hester, K. A., & Gessner, B. D. (2011). Identifying risk factors for child maltreatment in Alaska: A population-based approach. *American Journal of Preventive Medicine*, 40, 666-673.
- Patchen, L. Caruso, D., & Lanzi, R.G. (2009). Poor maternal mental health and trauma as risk factors for a short interpregnancy among adolescent mothers. *Journal of Psychiatric and Mental Health Nursing*, 16, 401-403.
- Pietrzak, R. H., Tsai, J., Harpaz-Rotem, I., Whealin, J. M., & Southwick, S. M. (2012). Support for a novel five-factor model of posttraumatic stress symptoms in three independent samples of Iraq/Afghanistan veterans: A

- confirmatory factor analytic study. *Journal of Psychiatric Research*, 46, 317-322.
- Putnam, F. W. (2006). The impact of trauma on child development. *Juvenile & Family Court Journal*, 57, 1-11.
- Putnam-Hornstein, E. & Needell, B. (2011). Predictors of child protective service contact between birth and age five: An examination of California's 2002 birth cohort. *Children and Youth Services Review*, 33, 2400-2407.
- Pynoos, R., Rodriguez, N., Steinberg, A., Stuber, M., & Frederick, C. (1998). The UCLA PTSD reaction index for DSM IV (Revision 1). Los Angeles: UCLA Trauma Psychiatry Program.
- Radloff, L.S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.
- Radloff, L.S. (1991). The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young adults. *Journal of Youth and Adolescence*, 20, 149-166.
- Radloff, L. S., & Locke, B. Z. (1986). The Community Mental Health Assessment Survey and the CES-D scale. In M. Weissman, J. Myers, & C. Ross (Eds.), *Community surveys*. New Brunswick, NJ: Rutgers University Press.
- Rainey, D.Y., Stevens-Simon, C., & Kaplan, D.W. (1995). Are adolescents who report prior sexual abuse at higher risk for pregnancy? *Child Abuse & Neglect*, 19, 1283-1288.

- Reid-Cunningham, A.R. (2009). Parent child relationship and mother's sexual assault history. *Violence Against Women*, 15, 920-932.
- Renker, P.R. (1999). Physical abuse, social support, self-care, and pregnancy outcomes of older adolescents. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 28, 377-388.
- Rickert, V.I., Wiemann, C.M., Harrykissoo, S.D., Berenson, A.B., & Kolb, E. (2002). The relationship among demographics, reproductive characteristics, and intimate partner violence. *American Journal of Obstetrics and Gynecology*, 187, 1002- 1007.
- Rodriguez, N., Steinberg, A.S., Saltzman, W.S. & Pynoos, R.S. (2001, December). *PTSD Index: preliminary psychometric analyses of child and parent versions*. Symposium conducted at the Annual Meeting of the International Society for Traumatic Stress Studies, New Orleans , LA.
- Rosenberg, H. J. & Jankowski, M. K. (2009). Adolescents. In K. T. Mueser, S. D. Rosenberg, & H. J. Rosenberg (Eds.). *Treatment of Posttraumatic stress disorder in special populations* (pp. 255-266). Washington, DC: APA.
- Roussos, A., Goenjian, A. K., Steinberg, A. M., Sotiropoulou, C., Kakaki, M., Kabakos, C., Karagianni, S., & Manouras, V. (2005). Posttraumatic stress and depressive reactions among children and adolescents after the 1999 earthquake in Ano Liosia, Greece. *American Journal of Psychiatry*, 162, 530-537.
- Rutter, M. & Sroufe, L.A. (2000). Developmental psychopathology: Concepts and challenges. *Development and Psychopathology*, 12, 265-296.

- Sack, W. H., Seeley, J. R., & Clarke, G. N. (1997). Does PTSD transcend cultural barriers? A study from the Khmer Adolescent Refugee Project. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 49-54.
- Sarri, R. & Phillips, A. (2004). Health and social services for pregnant and parenting high risk teens. *Children and Youth Services Review*, 26, 537-560.
- Saul, A. L., Grant, K. E., & Smith Carter, J. (2008). Post-traumatic reactions in adolescents: How well do the DSM-IV PTSD criteria fit the real life experience of trauma exposed youth? *Journal of Abnormal Child Psychology*, 36, 915-925.
- Saul, A. L., Grant, K. E., & Smith Carter, J. (2008). Post-traumatic reactions in adolescents: How well do the DSM-IV PTSD criteria fit the real life experience of trauma exposed youth? *Journal of Abnormal Child Psychology*, 36, 915-925.
- Scannapieco, M. & Carrick, K. C. (2004). Families in poverty: those who maltreat their infants and toddlers and those who do not. *Journal of Family Social Work*, 7, 49-70.
- Schatz, J. N., & Lounds, J. J. (2007). Child maltreatment: Precursors of developmental delays. In J. G. Borkowski, J. R. Farris, T. L. Whitman, S. S. Carothers, K. Weed, & D. A. Keogh (Eds.), *Risk and resilience: Adolescent mothers and their children grow up* (pp. 125-150). Mahwah, NJ: Lawrence Erlbaum.

- Schechter, D.S., Coots, T., Zeanah, C.H., Davies, M., Coates, S.W., Trabka, K.A., Marshall, R.D., Liebowitz, M.R., & Myers, M.M. (2005). Maternal mental representations of the child in an inner-city clinical sample: Violence-related posttraumatic stress and reflective functioning. *Attachment & Human Development*, 7(3), 313-331.
- Schechter, D.S., Myers, M.M., Brunell, S.A., Coates, S.W., & Zeanah, C.H. (2006). Traumatized mothers can change their minds about their toddlers: Understanding how a novel use of video feedback supports positive change of maternal attributions. *Infant Mental Health Journal*, 27, 429-447.
- Schechter, D.S., Zygmont, A., Coates, S.W., Davies, M., Trabka, K.A., & McCaw, J. (2007). Caregiver traumatization adversely impacts young children's mental representations on the MacArthur Story-Stem Battery. *Attachment & Human Development*, 9, 187-205.
- Scheeringa, M.S. & Zeanah, C.H. (2001). A relational perspective on PTSD in early childhood. *Journal of Traumatic Stress*, 14, 799-815.
- Schmidt, R. M., Wiemann, C. M., Rickert, V. I., & Smith, E. O. (2006). Moderate to severe depressive symptoms among adolescent mothers followed four years postpartum. *Journal of Adolescent Health*, 38, 712-718.
- Schwerdtfeger, K.L. & Goff, B.S.N (2007). Intergenerational transmission of trauma: Exploring mother-infant prenatal attachment. *Journal of Traumatic Stress*, 20, 39-51.

- Scott, C. K., Sonis, J., Creamer, M., & Dennis, M. L. (2006). Maximizing follow-up in longitudinal studies of traumatized populations. *Journal of Traumatic Stress, 19*, 757-769.
- Sharps, P.W., Campbell. J., Baty, M.L., Walker, K.S., & Bair-Merritt, M.H. (2008). Current evidence on perinatal home visiting and intimate partner violence. *JOGNN, 37*, 480-491.
- Simms, L. J., Watson, D., & Doebbeling, B. N. (2002). Confirmatory factor analyses of Posttraumatic stress symptoms on deployed and nondeployed veterans of the Gulf War. *Journal of Abnormal Psychology, 111*, 637-647.
- Smith, D. K., Leve, L. D., & Chamberlain, P. (2006). Adolescent girls' offending and health-risking behavior: The predictive role of trauma. *Child Maltreatment, 11*, 346-353.
- SmithBattle, L. (2009). Reframing the risks and losses of teen mothering. *MCN, The American Journal of Maternal/Child Nursing, 34*, 122-128.
- Sommer, K. S., Whitman, T. L., Borkowski, J. G., Gondoli, D. M., Burke, J., Maxwell, S. E., et al., (2000). Prenatal maternal predictors of cognitive and emotional delays in children of adolescent mothers. *Adolescence, 35*, 87-112.
- Spieker, S. J., Larson, N. C., Lewis, S. M., White, R. D., & Gilchrist, L. (1997). Children of adolescent mothers: Cognitive and behavioral status at age six. *Child and Adolescent Social Work Journal, 14*, 335-364.

- Spinazzola, J., Blaustein, M., & van der Kolk, B.A. (2005). Posttraumatic Stress Disorder treatment outcome research: The study of unrepresentative samples? *Journal of Traumatic Stress, 18*, 425-436.
- Steinberg, A. M., Brymer, M. J., Decker, K. B., & Pynoos, R. S. (2004). The University of California at Los Angeles Post-traumatic Stress Disorder Reaction Index. *Current Psychiatry Reports, 6*, 96-100.
- Stevens, J., Ammerman, R.T., Putnam, F.G., & Van Ginkel, J.B. (2002). Depression and trauma history in first-time mothers receiving home visitation. *Journal of Community Psychology, 30*, 551-564.
- Stevens, J., Ammerman, R. T., Putnam, F. W., Gannon, T., & Van Ginkel, J. B. (2005). Facilitator and barriers to engagement in home visitation. *Journal of Aggression, Maltreatment, & Trauma, 11*, 75-92.
- Stevenson, W., Maton, K.I., & Teti, D.M. (1999). Social support, relationship quality, and well-being among pregnant adolescents. *Journal of Adolescence, 22*, 109-12.
- Stewart, A. J., Steiman, M., Cauce, A. M., Cochran, B. N., Whitbeck, L. B., & Hoyt, D. R. (2004). Victimization and Posttraumatic stress disorder among homeless adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 43*, 325-331.
- Straus, M.A. (1979) Measuring Intrafamily Conflict and Violence: The Conflict Tactics (CT) scales. *Journal of Marriage and the Family, 41*, 75-88.
- Straus, M.A., Hamby, S.L., Fineklhor, D., Moore, D.W., & Runyan, D. (1998). Identification of child maltreatment with the Parent-Child Conflict Tactics

- Scales: Development and psychometric data for a national sample of American parents. *Child Abuse & Neglect*, 22, 249-270.
- Straus, M.A., Hamby, S.L., McCoy, S.B., & Sugarman, D.B. (1996). The revised conflict tactics scale (CTS2). *Journal of Family Issues*, 17, 283-336.
- Sussex, B. & Corcoran, K. (2005). The impact of domestic violence on depression in teen mothers: Is the fear or threat of violence sufficient? *Brief Treatment and Crisis Intervention*, 5, 109-120.
- Sweet, M. A. & Applebaum, M. I. (2004). Is home visiting an effective strategy? A meta-analytic review of home visiting programs for families with young children. *Child Development*, 75, 1435-1456.
- Switzer, G. E., Dew, M. A., Thompson, K., Goycoolea, J. M., Derricott, T., & Mullins, S. D. (1999). Posttraumatic stress disorder and service utilization among urban mental health center clients. *Journal of Traumatic Stress*, 12, 25-39.
- Taylor, S., Kuch, K., Koch, W. J., Crocket, D. J., & Passey, G. (1998). The structure of posttraumatic stress symptoms. *Journal of Abnormal Psychology*, 107, 154-160.
- Tsuchiya, K. J., Agerbo, E., & Mortensen, P. B. (2005). Parental death and bipolar disorder: A robust association was found in early maternal suicide. *Journal of Affective Disorders*, 86, 151-159.
- van der Kolk, B., Roth, S., Pelcovitz, D., Sunday, S., & Spinazzola, J. (2005). Disorders of extreme stress: The empirical foundation of a complex adaptation to trauma. *Journal of Traumatic Stress*, 18, 5, 389-399.

- Wagner, M. M. & Clayton, S. L. (1999). The Parents as Teachers Program: Results from two demonstrations. *The Future of Children*, 9, 91-115.
http://www.futureofchildren.org/futureofchildren/publications/docs/09_01_04.pdf
- Wagner, M., Spiker, D., & Linn, M. I. (2002). The effectiveness of the Parents as Teachers program with low-income parents and children. *Topics in Early Childhood Special Education*, 22, 67-81.
- Wagner, M., Spiker, D., Linn, M. I., & Hernandez, F. (2003). Dimensions of parental engagement in home visiting programs. *Topics in Early Childhood Special Education*, 23, 171-187.
- Wang, L., Di, L., Zhongquan, L., & Armour, C. (2011). Posttraumatic stress disorder symptom structure in Chinese adolescents exposed to a deadly earthquake. *Journal of Abnormal Child Psychology*, 39, 749-758.
- Wang, L., Long, D., Li, Z., & Armour, C. (2011). Posttraumatic stress disorder symptom structure in Chinese adolescents exposed to a deadly earthquake. *Journal of Abnormal and Child Psychology*, 39, 749-758.
- Watson, D. (2005). Rethinking the mood and anxiety disorders: A quantitative hierarchical model for *DSM-V*. *Journal of Abnormal Psychology*, 114, 522-536.
- Weaver, C. M. & Akai, C. E. (2007). Understanding the cycle: Violence in the lives of at-risk children. In J. G. Borkowski, J. R. Farris, T. L. Whitman, S. S. Carothers, K. Weed, & D. A., Keogh (Eds.), *Risk and resilience:*

Adolescent mothers and their children grow up (pp. 151-178). Mahwah, NJ: Lawrence Erlbaum Associates.

Weimann, C.M., Agurcia, C.A., Berenson, A.B., Volk, R.J., & Rickert, V.I. (2000). Pregnant adolescents: Experiences and behaviors associated with physical assault by an intimate partner. *Maternal and Child Health Journal*, 4, 93-101.

Weine, S.M., Becker, D.F., Levy, K.N., Edell, W.S., & McGlashan, T.H. (1997). Childhood trauma histories in adolescent inpatients. *Journal of Traumatic Stress*, 10, 291-298.

Weinman, M.L., Smith, P.B., Geva, J., & Buzi, R.S. (1998). Pregnant and postpartum adolescents' perceptions of the consequences of child abuse. *Child and Adolescent Social Work Journal*, 15, 287-301.

Widom, C.P. (1989). Does violence beget violence? A critical examination of the literature. *Psychological bulletin*, 106(1), 3-28.

Wilcox, H. C., Kuramoto, S. J., Lichtenstein, P., Langstrom, N., Brent, D. A., & Runeson, B. (2010). Psychiatric morbidity, violent crime, and suicide among children and adolescents exposed to parental death. *Journal of the American Academy of Child & Adolescent Psychiatry*, 49, 514-523.

Woodward, L.J. & Ferguson, D.M. (1999). Early conduct problems and later risk of teenage pregnancy in girls. *Development and Psychopathology*, 11, 127-141.

- Wright, M.O, Fopma-Loy, J. & Fischer, S. (2005). Multidimensional assessment of resilience in mothers who are child sexual abuse survivors. *Child Abuse & Neglect*, 29, 1173-1193.
- Wu, S. S., Ma C-X., Carter, R. L., Ariet, M., Feaver, E. A., Resnick, M. B., & Roth, J. (2004). Risk factors for infant maltreatment: A population-based study. *Child Abuse & Neglect*, 28, 1253-1264.
- Yufik, T. & Simms, L. J. (2010). A meta-analytic investigation of the structure of posttraumatic stress disorder symptoms. *Journal of Abnormal Psychology*, 119, 764-776.
- Ziv IV, Y., Aviezer, O., Gini, M., Sagi, A., & Koren-Karie, N. (2000). Emotional availability in the mother-infant dyad as related to the quality of infant-mother attachment relationship. *Attachment & Human Development*, 2, 149-169.