PTSD in Trauma-Exposed Adolescents: The Role of Interpersonal Problems and Trauma Type

by

Kathryn N. Abramoski

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Nursing)
in the University of Michigan
2019

Doctoral Committee:

Assistant Professor Sarah A. Stoddard, Chair
Professor Julian D. Ford, University of Connecticut
Associate Professor Alison L. Miller
Professor Julia S. Seng

Kathryn N. Abramoski

kabramos@umich.edu

ORCID iD: 0000-0003-3025-6317

Acknowledgements

I would like to thank all my committee members for their time and contribution to my professional development: Dr. Sarah Stoddard, Dr. Julia Seng, Dr. Julian Ford, and Dr. Alison Miller. I would also like to thank Dr. Ernestine Briggs-King, and all of the other people at the Duke NCCTS, for working with me and sharing their expertise for this research. Additionally, I would like to thank the 56 sites within the NCTSN that have contributed data to the Core Data Set as well as the children and families that have contributed to our growing understanding of childhood traumatic stress. I would like to thank the Rita and Alex Hillman Foundation for the Hillman Scholarship in Nursing Innovation who helped to fund my doctoral studies. Finally, I especially want to thank everyone who provided support and encouragement throughout this process, including Paul, my parents, family, and friends.

Table of Contents

List of Tables

List of Figures

List of Appendices

Appendix

Abstract

Childhood trauma is associated with an array of negative outcomes throughout the lifespan, including Post-Traumatic Stress Disorder (PTSD). Youth have varying rates of PTSD after being exposed to a trauma, but the reason is unknown. Further, rates of PTSD vary based on trauma type (i.e. interpersonal and non-interpersonal traumas). While interpersonal problems have previously been associated with trauma, stress, anxiety, and depression, much less is known about if interpersonal problems play a role in the relationship between trauma and PTSD in adolescents. Given the uniqueness of adolescent relationships, and how adolescent behaviors can shape behaviors in adulthood, examining these associations could inform knowledge and future treatments for trauma-exposed adolescents.

Associations between trauma, interpersonal problems, and PTSD symptom severity therefore were examined in a large, clinical sample of trauma-exposed adolescents with de-identified data from the National Child Traumatic Stress Network (NCTSN) Core Data Set. This secondary data analysis used path analyses to test a series of models that linked childhood trauma with PTSD symptom severity via interpersonal problems and that explored differences in these models by trauma type. Interpersonal problems were operationalized by examining parent-rated social problem behaviors and aggressive behaviors. Interpersonal problems partially mediated the relationship between childhood trauma and PTSD symptom severity via social problem behaviors (Aim 1). When interpersonal traumas and non-interpersonal traumas were examined in separate models, social problem behaviors fully mediated the relationship between

interpersonal trauma and PTSD symptom severity; however, interpersonal problems did not mediate the association between non-interpersonal trauma and PTSD symptom severity (Aim 2). For the combined interpersonal and non-interpersonal trauma model, social problem behaviors partially mediated the relationship between interpersonal trauma and PTSD symptom severity. There were no direct or indirect associations between non-interpersonal trauma and PTSD symptom severity when the model accounted for the impact of the interpersonal trauma.

These findings suggest that social problem behaviors, immature, dependent, and socially incompetent behaviors with peers and adults, are important in the association between trauma and PTSD symptom severity. Findings suggest that interpersonal traumas have a greater impact on social problem behaviors, and PTSD, than non-interpersonal traumas. In a scoping review that was conducted in addition to the statistical analyses, gaps in interventions focused on interpersonal problems for trauma-exposed adolescents were identified. Interventions that incorporate content on interpersonal problems could benefit adolescents who have experienced a trauma, specifically adolescents who experienced an interpersonal trauma.

Chapter I

Introduction

Significance

Experiencing traumatic stressors (e.g. abuse or neglect) in childhood is often associated with negative outcomes throughout the lifespan, including anxiety, depression, aggression, suicidality, PTSD, and criminal activities in adolescence (Dube et al., 2006; Greeson et al., 2014), and alcoholism, illicit drug use, heart disease, lung disease, suicide, obesity, and depression in adulthood (Felitti et al., 1998). There is a significant economic burden of childhood trauma in the United States, as the estimated cost of childhood trauma and trauma-related services, including mental health care, hospitalization, medical healthcare, criminal justice services, and child welfare services ranges anywhere from $103.8 billion per year (Wang & Holton, 2007) to $124 billion (Fang et al., 2012). Given the negative outcomes and economic burden of childhood trauma, identifying ways to intervene is imperative for improving outcomes and reducing healthcare spending.

Although there are many different traumatic stressors, two overarching categories are interpersonal (i.e. trauma that occurs as a result of actions by other people; e.g. abuse) and non-interpersonal (i.e. trauma that does not occur as a result of actions by other people; e.g. natural disaster) traumas. Although both trauma types are associated with negative outcomes, the sequalae of the trauma may differ (Charuvastra & Cloitre, 2008; Kessler et al., 2005; Woodward et al., 2015). Interpersonal traumas are associated with worsening mental health problems

compared to non-interpersonal traumas (Kerig et al., 2009; Alisic et al., 2014). In a sample of adolescents, Kerig et al., (2009) found that experiencing an interpersonal trauma was associated with Post-Traumatic Stress Disorder (PTSD), but experiencing a non-interpersonal trauma was not associated with PTSD. Similarly, Alisic and colleagues (2014) found in a meta-analysis that aimed to determine the incidence of PTSD in trauma-exposed children and adolescents that youth exposed to interpersonal traumas had the highest incidence of PTSD, whereas youth exposed to non-interpersonal traumas had the lowest incidence of PTSD. Kessler and colleagues (2017) found that adults exposed to interpersonal violence traumas had the highest incidence of PTSD. These studies suggest that interpersonal traumas may have a greater impact on mental health, particularly PTSD, compared to non-interpersonal traumas.

Interpersonal problems, or problematic interpersonal relationships and difficulties relating to others, may play a role in the association between trauma and PTSD (Hoermann, Zupanick, & Dombeck, 2013; Horowitz, Rosenberg, & Bartholomew, 1993). Previous studies using cross-sectional data have found that trauma is associated with interpersonal problems (Perlman, Kalish, & Pollak, 2008; Burack et al., 2006) and can lead to the development of interpersonal problems (Kim & Cicchetti, 2010; Elliot et al., 2005) in adolescents. Additionally, interpersonal problems are risk factors for the development of health problems, including higher levels of stress (Segrin, 2001; Shahar, Joiner, Zuroff, & Blatt, 2004), generalized anxiety disorder (Borkovec, Newman, Pincus, & Lytle, 2002; Eng & Heimberg, 2006), depression (Petty, Sachs-Ericsson, & Joiner, 2004; Vittengl, Clark, & Jarrett, 2003), and Post-Traumatic Stress Disorder (Bolton et al., 2004; McLean et al., 2013). In contrast, positive interpersonal relationships are associated with lower depression rates (Lakey & Cronin, 2008), competency, and self-esteem (Cast & Burke, 2002).

Although experiencing trauma in childhood is associated with a variety of negative outcomes (e.g. depression, anxiety), one specific negative outcome is Post-Traumatic Stress Disorder (PTSD). PTSD is a mental health disorder that is associated with experiencing traumatic stressors, and has four symptom clusters: re-experiencing, avoidance, negative alterations in mood and cognitions, and hyperarousal (American Psychiatric Association, 2013).

Interpersonal problems may help to explain the association between trauma and PTSD in youth. Previous research supports an association between interpersonal problems and PTSD in adolescents who experienced trauma. Specifically, in a sample of adolescents who survived a sinking ship, impairments in friendship and social functioning were associated with PTSD symptoms (Bolton et al., 2004). Similarly, in a sample of adolescents who had a history of childhood sexual abuse, poorer social functioning was associated with greater PTSD symptom severity (McLean et al., 2013). However, research that supports this association in adolescents is limited, and of the research that does exist, no studies have examined the categories of interpersonal and non-interpersonal trauma separately and their relation to interpersonal problems and PTSD.

Previous research examining the relationship between interpersonal and non-interpersonal trauma and a similar, albeit different construct from interpersonal problems, social support, further supports the view that differences in PTSD rates may be due in part to interpersonal problems. In a meta-analysis of adults who experienced trauma in adulthood, Brewin and colleagues (2000) found that lack of social support was a major risk factor in the development of PTSD. In a prospective cohort study of maltreated and non-maltreated children, Sperry and Widom (2013) found that thirty years after experiencing childhood adversity, the maltreated individuals reported significantly lower levels of social support than the matched

controls, and that lower social support predicted subsequent anxiety and depression. While this evidence supports that a lack of positive social support is significant in developing PTSD, more research examining the specific role of interpersonal problems on PTSD is needed, as lack of positive social support is not the same thing as interpersonal problems. Interestingly, research supports the view that it is the negative, conflicting relationships, rather than positive support, that is more strongly related to the severity of PTSD symptoms (Andrews et al., 2003; Borja, Callahan, & Long, 2006; Zoellner, Foa, & Brigidi, 1999). Additionally, given the nature of interpersonal traumas and how they are often stigmatizing, elicit negative responses within one's social network, and can disrupt one's fundamental principles of justice, autonomy, beneficence, and dignity (Charuvastra & Cloitre, 2008; Punamaki et al., 2005; Ford, 2017), these types of trauma type are particularly likely to lead to or exacerbate interpersonal problems. However, to date, research examining this relationship is incomplete.

Of particular note, research that has found a relationship between childhood trauma and interpersonal problems, and PTSD (Bolton et al., 2004; McLean et al., 2013; Beck, Grant, Clapp, & Palyo, 2008; McFarlane & Bookless, 2001) has not examined the potential mediating role of interpersonal problems in the relationship between trauma and PTSD. While Sperry and Widom (2013) found that a lack of social support mediated the relationship between childhood trauma and anxiety and depression in adulthood, research is still needed to determine if interpersonal problems mediate the relationship between trauma and PTSD. Additionally, given that adolescent relationships are important for youths' resilience, self-esteem, and happiness (Graber, Turner, & Hill, 2016; Jellinek, Patel, & Froehle, 2002; Barber et al., 2005), more research is needed examining this relationship in adolescents who experienced trauma.

Interpersonal problems may explain the documented link between interpersonal traumas and PTSD (Alisic et al., 2014; Kerig et al., 2009; Frans et al., 2005; Shalev & Freedman, 2005). Although research has found a relationship between both interpersonal and non-interpersonal traumas and interpersonal problems (Elliott, Cunningham, Linder, Colangelo, & Gross, 2005; Kim & Cicchetti, 2004; Katz et al., 2011; Goldschmidt et al., 2010; Poole, Dobson, & Pusch, 2018; Bolton et al., 2004), most of that research has focused on interpersonal traumas (Elliott, Cunningham, Linder, Colangelo, & Gross, 2005; Kim & Cicchetti, 2004; Katz et al., 2011; Goldschmidt et al., 2010; Poole, Dobson, & Pusch, 2018), rather than on non-interpersonal traumas (Bolton et al., 2004). While it is known that interpersonal traumas are often stigmatizing and can disrupt one's fundamental principles of justice, autonomy, beneficence, and dignity, and sense of security (Charuvastra & Cloitre, 2008; Punamaki et al., 2005; Ford, 2017), and therefore may be related to more severe interpersonal problems than in those who experienced non-interpersonal problems, research has not examined how the trauma type experienced (i.e. interpersonal or non-interpersonal) may be differentially associated with interpersonal problems, and subsequent PTSD. Clarifying these relationships could help to tailor future interventions for youth with PTSD who have experienced different types of trauma.

Specific Aims

Given the limitations of previous research, and the gaps in what is known, the specific aims for this study are as follows:

In a sample of 12-18-year old adolescents from the National Child Traumatic Stress Network Core Data Set who have a history of at least one trauma:

Aim 1: To examine the relationship between childhood trauma, interpersonal problems, and PTSD, and to test a model that links childhood trauma with PTSD via interpersonal problems.

Hypothesis: Experiencing a greater number of traumas will lead to greater interpersonal problems. Greater interpersonal problems will lead to greater PTSD symptom severity. Interpersonal problems will mediate the relationship between childhood trauma and PTSD.

Aim 2: To explore the relationship between childhood trauma type (interpersonal and non-interpersonal), interpersonal problems, and PTSD, and to test models that link childhood trauma type with PTSD via interpersonal problems.

Hypothesis: Experiencing a greater number of interpersonal traumas will lead to greater interpersonal problems. Greater interpersonal problems will lead to greater PTSD symptom severity. Experiencing a greater number of non-interpersonal traumas will not lead to greater interpersonal problems. Interpersonal problems will mediate the relationship between interpersonal childhood trauma and PTSD. Interpersonal problems will not mediate the relationship between non-interpersonal childhood trauma and PTSD.

In a literature review that will be conducted in addition to the proposed secondary analyses:

Aim 3: To examine the content, efficacy, and generalizability of interventions that, at least in part, focus on improving interpersonal problems in those who have experienced trauma.

Defining Terms

1) Childhood trauma: "A frightening, dangerous, or violent event that poses a threat to a child's life or bodily integrity." (The National Child Traumatic Stress Network, n/d).
2) Interpersonal trauma: Trauma that occurs as a direct result of actions by other people (Dvir, Ford, Hill, & Frazier, 2014; Alisic et al., 2014). Examples include abuse and neglect.

3) Non-interpersonal trauma: Trauma that does not occur as a result of actions by other people (Dvir, Ford, Hill, & Frazier, 2014; Alisic et al., 2014). Examples include natural disasters and severe accidents.
4) Interpersonal problems: "problematic interpersonal relationships and difficulties relating to others, including with peers and family, that create a negative impact on one's ability to form healthy and rewarding relationships" (Hoermann, Zupanick, & Dombeck, 2013; Horowitz, Rosenberg, & Bartholomew, 1993). In adolescents, interpersonal problems are identified through one's problematic relationships with peers and families, for instance by examining if one is lonely, clings to adults, gets teased, is not liked, or is aggressive (Achenbach, 1994), as those interactions are not healthy or rewarding.
5) Post-traumatic stress disorder (PTSD): a mental health problem from experiencing trauma that consists of re-experiencing, avoidance, negative cognitions and mood, and hyperarousal. Re-experiencing involves the persistent re-experiencing of the trauma through thoughts or perceptions, images, dreams, illusions, or intense psychological distress to cues that symbolize some aspect of the event. The avoidance cluster involves avoidance of stimuli that are associated with the trauma, such as avoidance of people or places that trigger recollections of the event. The negative cognitions and mood symptoms cluster involves negative thoughts about oneself or the world, or distorted feelings like blame. The fourth symptom cluster, arousal, involves alteration in arousal and reactivity, such as by irritable behavior and angry outbursts (American Psychiatric Association, 2013).

References

Achenbach, T. M. (1994). Child Behavior Checklist and related instruments.

Alisic, E., Zalta, A. K., Van Wesel, F., Larsen, S. E., Hafstad, G. S., Hassanpour, K., & Smid, G., E. (2014). Rates of post-traumatic stress disorder in trauma-exposed children and adolescents: meta-analysis. *The British Journal of Psychiatry*, *204*(5), 335-340.

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Andrews, B., Brewin, C. R., & Rose, S. (2003). Gender, social support, and PTSD in victims of violent crime. *Journal of Traumatic Stress*, *16*(4), 421-427.

Beck, J. G., Grant, D. M., Clapp, J. D., & Palyo, S. A. (2009). Understanding the interpersonal impact of trauma: Contributions of PTSD and depression. *Journal of Anxiety Disorders*, *23*(4), 443-450.

Barber, B. K., Stolz, H. E., Olsen, J. A., Collins, W. A., & Burchinal, M. (2005). Parental support, psychological control, and behavioral control: Assessing relevance across time, culture, and method. *Monographs of the Society for Research in Child Development*, 70(4), i-147.

Bolton, D., Hill, J., O'ryan, D., Udwin, O., Boyle, S., & Yule, W. (2004). Long-term effects of psychological trauma on psychosocial functioning. *Journal of Child Psychology and Psychiatry*, *45*(5), 1007-1014.

Borja, S. E., Callahan, J. L., & Long, P. J. (2006). Positive and negative adjustment and social support of sexual assault survivors. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *19*(6), 905-914.

Borkovec, T. D., Newman, M. G., Pincus, A. L., & Lytle, R. (2002). A component analysis of cognitive-behavioral therapy for generalized anxiety disorder and the role of interpersonal problems. *Journal of Consulting and Clinical Psychology*, *70*(2), 288.

Burack, J. A., Flanagan, T., Peled, T., Sutton, H. M., Zygmuntowicz, C., & Manly, J. T. (2006). Social perspective-taking skills in maltreated children and adolescents. *Developmental Psychology*, *42*(2), 207.

Cast, A. D., & Burke, P. J. (2002). A theory of self-esteem. *Social Forces*, *80*(3), 1041-1068.

Charuvastra, A., & Cloitre, M. (2008). Social bonds and posttraumatic stress disorder. *Annu. Rev. Psychol.*, *59*, 301-328.

Dube, S. R., Miller, J. W., Brown, D. W., Giles, W. H., Felitti, V. J., Dong, M., & Anda, R. F. (2006). Adverse childhood experiences and the association with ever using alcohol and initiating alcohol use during adolescence. *Journal of Adolescent Health*, *38*(4), 444-e1.

Dvir, Y., Ford, J. D., Hill, M., & Frazier, J. A. (2014). Childhood maltreatment, emotional dysregulation, and psychiatric comorbidities. *Harvard Review of Psychiatry*, *22*(3), 149.

Elliott, G. C., Cunningham, S. M., Linder, M., Colangelo, M., & Gross, M. (2005). Child physical abuse and self-perceived social isolation among adolescents. *Journal of Interpersonal Violence*, *20*(12), 1663-1684.

Eng, W., & Heimberg, R. G. (2006). Interpersonal correlates of generalized anxiety disorder: Self versus other perception. *Journal of Anxiety Disorders*, *20*(3), 380-387.

Fang, X., Brown, D. S., Florence, C. S., & Mercy, J. A. (2012). The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse & Neglect*, *36*(2), 156-165.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., ... & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, *14*(4), 245-258.

Ford, J. (2017). Complex trauma and complex posttraumatic stress disorder in *APA handbook of trauma psychology: Foundations in Knowledge, Vol. 1*. Chapter 15.

Goldschmidt, A. B., Sinton, M. M., Aspen, V. P., Tibbs, T. L., Stein, R. I., Saelens, B. E., ... & Wilfley, D. E. (2010). Psychosocial and familial impairment among overweight youth with social problems. *International Journal of Pediatric Obesity*, *5*(5), 428-435.

Graber, R., Turner, R., & Madill, A. (2016). Best friends and better coping: Facilitating psychological resilience through boys' and girls' closest friendships. *British Journal of Psychology, 107(2), 338–358.*

Greeson, J. K., Briggs, E. C., Layne, C. M., Belcher, H. M., Ostrowski, S. A., Kim, S., ... & Fairbank, J. A. (2014). Traumatic childhood experiences in the 21st century: broadening and building on the ACE studies with data from the National Child Traumatic Stress Network. *Journal of Interpersonal Violence*, *29*(3), 536-556.

Hoermann, S., Zupanick, C., & Dombeck, M. (2013). The most significant, defining featured of personality disorders: Interpersonal difficulties. From: https://www.mentalhelp.net/articles/the-most-significant-defining-featured-of-personality-disorders-interpersonal-difficulties/

Horowitz, L. M., Rosenberg, S. E., & Bartholomew, K. (1993). Interpersonal problems, attachment styles, and outcome in brief dynamic psychotherapy. *Journal of Consulting and Clinical Psychology*, *61*(4), 549.

Jellinek, M., Patel, B. P., & Froehle, M.C. (Eds.). (2002). *Bright Futures in Practice: Mental health—Volume I*. Practice guide. Arlington, VA: National Center for Education in Maternal and Child Health.

Katz, S. J., Conway, C. C., Hammen, C. L., Brennan, P. A., & Najman, J. M. (2011). Childhood social withdrawal, interpersonal impairment, and young adult depression: a mediational model. *Journal of Abnormal Child Psychology*, *39*(8), 1227.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*(6), 593-602.

Kerig, P. K., Ward, R. M., Vanderzee, K. L., & Moeddel, M. A. (2009). Posttraumatic stress as a mediator of the relationship between trauma and mental health problems among juvenile delinquents. *Journal of Youth and Adolescence*, *38*(9), 1214-1225.

Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Benjet, C., Bromet, E. J., Cardoso, G., ... & Florescu, S. (2017). Trauma and PTSD in the WHO world mental health surveys. *European Journal of Psychotraumatology*.

Kim, J., & Cicchetti, D. (2004). A longitudinal study of child maltreatment, mother–child relationship quality and maladjustment: The role of self-esteem and social competence. *Journal of Abnormal Child Psychology*, *32*(4), 341-354.

Kim, J., & Cicchetti, D. (2010). Longitudinal pathways linking child maltreatment, emotion

regulation, peer relations, and psychopathology. *Journal of Child Psychology and Psychiatry*, *51*(6), 706-716.

Lakey, B., & Cronin, A. (2008). Low social support and major depression: Research, theory and methodological issues. In *Risk Factors in Depression* (pp. 385-408).

McFarlane, A. C., & Bookless, C. (2001). The effect of PTSD on interpersonal relationships: Issues for emergency service workers. *Sexual and Relationship Therapy*, *16*(3), 261-267.

McLean, C. P., Rosenbach, S. B., Capaldi, S., & Foa, E. B. (2013). Social and academic functioning in adolescents with child sexual abuse-related PTSD. *Child Abuse & Neglect*, *37*(9), 675.

Petty, S. C., Sachs-Ericsson, N., & Joiner Jr, T. E. (2004). Interpersonal functioning deficits: temporary or stable characteristics of depressed individuals?. *Journal of Affective Disorders*, *81*(2), 115-122.

Perlman, S. B., Kalish, C. W., & Pollak, S. D. (2008). The role of maltreatment experience in children's understanding of the antecedents of emotion. *Cognition & Emotion*, *22*(4), 651-670.

Poole, J. C., Dobson, K. S., & Pusch, D. (2018). Do adverse childhood experiences predict adult interpersonal difficulties? The role of emotion dysregulation. *Child Abuse & Neglect*, *80*, 123-133.

Punamäki, R. L., Komproe, I. H., Qouta, S., Elmasri, M., & de Jong, J. T. (2005). The role of peritraumatic dissociation and gender in the association between trauma and mental health in a Palestinian community sample. *American Journal of Psychiatry*, *162*(3), 545-551.

Segrin, C. (2001). *Interpersonal Processes in Psychological Problems*. Guilford Press.

Shahar, G., Joiner Jr, T. E., Zuroff, D. C., & Blatt, S. J. (2004). Personality, interpersonal behavior, and depression: Co-existence of stress-specific moderating and mediating effects. *Personality and Individual Differences*, *36*(7), 1583-1596.

Sperry, D. M., & Widom, C. S. (2013). Child abuse and neglect, social support, and psychopathology in adulthood: A prospective investigation. *Child Abuse & Neglect*, *37*(6), 415-425.

The National Child Traumatic Stress Network (n/d). About Child Trauma. Retrieved from: https://www.nctsn.org/what-is-child-trauma/about-child-trauma

Vittengl, J. R., Clark, L. A., & Jarrett, R. B. (2003). Interpersonal problems, personality pathology, and social adjustment after cognitive therapy for depression. *Psychological Assessment*, *15*(1), 29.

Wang, C. T., & Holton, J. (2007). Total estimated cost of child abuse and neglect in the United States (pp. 1-5). Chicago, IL: Prevent Child Abuse America.

Woodward, M. J., Eddinger, J., Henschel, A. V., Dodson, T. S., Tran, H. N., & Beck, J. G. (2015). Social support, posttraumatic cognitions, and PTSD: The influence of family, friends, and a close other in an interpersonal and non-interpersonal trauma group. *Journal of Anxiety Disorders*, *35*, 60-67.

Zoellner, L. A., Foa, E. B., & Brigidi, B. D. (1999). Interpersonal friction and PTSD in female victims of sexual and nonsexual assault. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *12*(4), 689-700

Chapter II

Review of the Literature

Overview

In this study, aim 1 examined the relationship between childhood trauma, interpersonal problems, and PTSD, and assessed whether the relationship between childhood trauma and PTSD is mediated by interpersonal problems. Aim 2 explored differences in this mediation model based on trauma type (i.e. interpersonal and non-interpersonal trauma). These relationships were examined using a sample of adolescents who had a history of trauma from the National Child Traumatic Stress Network (NCTSN) Core Data Set. This chapter reviews literature on childhood trauma, interpersonal problems, and PTSD.

Literature Review

Childhood trauma.

Childhood trauma includes a range of traumatic stressors that can be experienced during childhood and adolescence. The National Child Traumatic Stress Network (NCTSN) uses a broad definition of trauma that encompasses a wide range of traumatic events. NCTSN defines traumatic stressors as, "A frightening, dangerous, or violent event that poses a threat to a child's life or bodily integrity." (The National Child Traumatic Stress Network, n/d). Traumatic stressors include experiences ranging from abuse and neglect to surviving a natural disaster, and can be categorized as interpersonal and non-interpersonal (Dvir, Ford, Hill, & Frazier, 2014). Interpersonal traumatic stressors are those that an individual experiences as the result of actions

by another person, such as abuse and neglect. Some of these interpersonal traumatic stressors have also been conceptualized as adverse childhood experiences (ACEs), polyvictimization, and complex trauma in the research literature; their conceptualizations vary based on whether they incorporate repeated exposure to one trauma (i.e. complex trauma; van der Kolk, 2005), exposure to multiple types of interpersonal traumas (i.e. polyvictimization; Finkelhor, Ormrod, & Turner, 2007), or fall into the broad categories of abuse, neglect, or household challenges (i.e. ACEs; Felitti et al., 1998). Table 1 includes a list of interpersonal trauma types. Non-interpersonal traumas are traumatic stressors that do not occur as a result of actions by another person, such as disasters or life-threatening accidents (Dvir et al., 2014; Alisic et al., 2014).

Table 1. Interpersonal Trauma Types

Trauma Type	Definition	Traumas Included	Citations
Adverse Childhood Experiences (ACEs)	10 different types of childhood trauma that fall into 3 broad categories of abuse, neglect, and household challenges.	Physical, emotion, and sexual abuse, emotional and physical neglect, having a parent with a mental illness, a mother treated violently, divorce, substance abuse, or an incarcerated relative.	Felitti et al., 1998
Polyvictimization	Exposure to multiple types of interpersonal traumatic stressors, such as violence or abuse.	Includes a wider range of interpersonal traumatic stressors, than ACEs, including bullying, school or community violence, and robbery	Finkelhor, Ormrod, & Turner, 2007; Richmond et al., 2009
Complex Trauma	A sub-type of interpersonal traumatic stressors that includes violence, abuse, exploitation, and neglect and happens repeatedly as opposed to a single-incident event. Complex trauma can be summarized with the 4 I's: *intentional* acts by another person (*interpersonal*), that are *inescapable*, and create a sense of fundamental	While it can overlap with ACEs and polyvictimization, it differs in its chronic nature and that it occurs within the caregiving system.	Ford, 2017; Cook et al., 2005; Spinazzola et al., 2005; van der Kolk, 2005

	insecurity Additionally, it occurs early in the child's life and occurs within the child's caregiving system		

Impact of childhood trauma.

The Centers for Disease Control and Prevention (CDC, 2010) approximates that 60% of the United States population has a history of childhood trauma. Childhood trauma is associated with many negative outcomes throughout the lifespan. Children who have trauma histories have poorer performance on attention, immediate verbal recall, and working memory tests, and worse behavior problems compared to children without trauma histories (Bücker et al., 2012; van der Kolk, 2003). Adolescents who report a history of trauma report higher rates of anxiety and depression, aggression, suicidality, Post-Traumatic Stress Disorder (PTSD), criminal activity, and an earlier initiation of substance use compared to peers who do not have a history of trauma (Dube et al., 2006; Greeson et al., 2014). Adults who have a history of childhood trauma have many negative physical and psychological outcomes, including depression, alcoholism, illicit drug use, heart disease, suicide attempts, lung disease, and obesity (Felitti et al., 1998; Anda et al., 2005).

Childhood trauma also has a significant economic impact. In the United States, it is estimated that the cost associated with childhood trauma and trauma-related services, including mental health care, hospitalization, medical healthcare, criminal justice services, and child welfare services, is $103.8 billion dollars per year (Wang & Holton, 2007). Similarly, the CDC estimates that the lifetime costs associated with one year of child maltreatment cases (physical abuse, sexual abuse, psychological abuse, and neglect) is $124 billion dollars (Fang et al., 2012). It is imperative to identify how trauma contributes to these negative outcomes. One way trauma

may contribute towards negative outcomes is through interpersonal problems. However, more research is needed to determine the role interpersonal problems play in the relationship between trauma and negative outcomes.

Interpersonal problems during adolescence.

Interpersonal relationships during adolescence are important for healthy development. In adolescence, positive relationships with peers can provide a sense of belonging and feelings of closeness, as they become increasingly independent and develop their own identity; this is linked to resilience (Graber, Turner, & Hill, 2016). However, positive relationships with parents are still critical as parents help to shape adolescents' moral and social values and their broader world views (Jellinek, Patel, & Froehle, 2002; Barber et al., 2005). Additionally, positive interpersonal relationships are associated with lower depression rates (Lakey & Cronin, 2008), competency, self-esteem (Cast & Burke, 2002), and happiness (Jellinek et al., 2002). While positive interpersonal relationships during adolescence are important for healthy development, difficulties with interpersonal relationships can contribute to negative outcomes.

Interpersonal problems, also referred to as poor social functioning, low social competence, interpersonal difficulties, or poor peer and family relationships, are defined as problematic interpersonal relationships and difficulties relating to others, including with peers and family, that create a negative impact on one's ability to form healthy and rewarding relationships (Hoermann, Zupanick, & Dombeck, 2013; Horowitz, Rosenberg, & Bartholomew, 1993; Rose-Krasnow & Brock, 1997). This can also include the inability to achieve personal goals in social interactions (Rubin and Krasnor, 1992). In adolescents, interpersonal problems are identified through one's problematic relationships and interactions, for instance by examining whether one is lonely, clings to adults, gets teased, is not liked, or is aggressive (Achenbach,

1991; Card, Stucky, Sawalani, & Little, 2008). Adolescents who exhibit interpersonal problems are at risk for the development of health problems, including higher levels of stress (Segrin, 2001; Shahar, Joiner, Zuroff, & Blatt, 2004), generalized anxiety disorder (Borkovec, Newman, Pincus, & Lytle, 2002; Eng & Heimberg, 2006), and depression (Petty, Sachs-Ericsson, & Joiner, 2004; Vittengl, Clark, & Jarrett, 2003).

Childhood trauma and interpersonal problems.

Interpersonal trauma during childhood is associated with interpersonal problems (Elliott, Cunningham, Linder, Colangelo, & Gross, 2005; Kim & Cicchetti, 2004; Perlman, Kalish, & Pollak, 2008; Burack et al., 2006; DePrince, Chu, & Combs, 2008). Kim and Cicchetti (2010) found in a sample of 6 to 12-year-old children that those who had experienced maltreatment, neglect, physical abuse, or sexual abuse were rejected more and accepted less among peers compared to their non-maltreated peers. Similarly, Elliot et al., (2005) found that experiencing childhood physical abuse predicted social isolation in adolescence. In a longitudinal study, Katz and colleagues (2011) found that having a mother with depression or a history of depression (i.e., an adverse childhood experience) was associated with interpersonal problems in adolescents. In a sample of overweight 7 to 12-year-old children who had interpersonal problems, Goldschmidt and colleagues (2010) similarly found that parent psychopathology (i.e. having parents who had mental health problems, another adverse childhood experience), was positively associated with interpersonal problems. In a recent study, Poole and colleagues (2018) examined the association between adverse childhood experiences (i.e., 10 types of ACEs encompassing abuse, neglect, and household challenges) and interpersonal problems in a sample of adults. They found that each adverse childhood experienced was individually associated with interpersonal problems in adulthood (Poole, Dobson, & Pusch, 2018). Additionally, Poole and colleagues (2018) saw a

cumulative effect, as the number of ACEs one experienced increased, so did interpersonal problems.

In summary, there is a positive relationship between interpersonal traumas and interpersonal problems in adolescence and adulthood. However, to date, this research is limited to the interpersonal traumas of abuse, neglect, and the other ACEs. In adolescents specifically, it is limited to abuse, neglect, and having a parent with a mental illness. No studies have examined how other interpersonal traumas, such as witnessing community violence or domestic abuse, impact interpersonal problems. Examining the impact of other interpersonal traumas besides abuse and neglect on interpersonal problems has not been examined previously in adolescents and could inform treatment for those who experienced an interpersonal trauma.

To date, there is no empirical evidence to support a direct relationship between non-interpersonal traumas and interpersonal problems. Studies that have examined the relationship between non-interpersonal traumas and interpersonal problems, have also included PTSD (i.e., examining how PTSD is associated with interpersonal problems), which limits knowledge on if non-interpersonal traumas are directly related to interpersonal problems. For example, in a sample of adolescents who survived a sinking ship, Bolton and colleagues (2004) found that PTSD symptoms were associated with impairments in friendship and social functioning. Although previous research supports a relationship between interpersonal trauma and interpersonal problems, it is not known if there is a direct relationship between non-interpersonal traumas and interpersonal problems. It is possible that non-interpersonal traumas may not be related to interpersonal problems given the differing nature of the traumas and that non-interpersonal traumas are not caused by someone else. Interpersonal traumas are often stigmatizing, are often chronic, are likely to elicit negative responses within one's social

network, and can violate one's fundamental principles of beneficence, dignity, autonomy, and justice (Charuvastra & Cloitre, 2008; Punamaki et al., 2005; Ford, 2017), compared to non-interpersonal traumas. Given the differing nature of interpersonal and non-interpersonal traumas, it conceptually makes sense that interpersonal traumas influence interpersonal problems more than non-interpersonal traumas. Thus, the nature of the trauma may vastly impact interpersonal problems. In turn, interpersonal problems could further explain the resulting negative outcomes that occur, as interpersonal problems are risk factors for the development of mental health problems (Segrin, 2001; Shahar, Joiner, Zuroff, & Blatt, 2004; Borkovec, Newman, Pincus, & Lytle, 2002; Eng & Heimberg, 2006; Petty, Sachs-Ericsson, & Joiner, 2004; Vittengl, Clark, & Jarrett, 2003). Further research is needed to explore the role interpersonal problems play in the relationship between trauma and negative outcomes.

Trauma and Post-Traumatic Stress Disorder (PTSD).

Although all types of trauma are associated with a variety of negative outcomes (e.g. anxiety, depression), one specific and important negative outcome resulting from trauma is Post-Traumatic Stress Disorder (PTSD). PTSD is a mental health disorder that results from experiencing trauma that consists of the symptoms of re-experiencing, avoidance, negative beliefs and feelings, and hyperarousal (American Psychiatric Association, 2013). Re-experiencing involves the persistent re-experiencing of the trauma through thoughts or perceptions, images, dreams, illusions, or intense psychological distress to cues that symbolize some aspect of the event. The avoidance cluster involves avoidance of stimuli that are associated with the trauma, such as avoidance of people or places that trigger recollections of the event. The third symptom cluster, negative beliefs and feelings, involves negative alterations in thought and mood as characterized by symptoms like an inability to remember an important aspect of the

event, persistent negative emotional state, and shame and blame. Finally, the fourth symptom cluster, arousal, involves alteration in arousal and reactivity, such as by irritable behavior and angry outbursts (American Psychiatric Association, 2013).

PTSD can result from experiencing both interpersonal and non-interpersonal traumas (Alisic et al., 2014; Kar & Bastia, 2006), but experiencing an interpersonal trauma may put one at greater risk for developing PTSD compared to experiencing a non-interpersonal trauma (Alisic et al., 2014; Kerig et al., 2009; Charuvastra & Cloitre, 2008). In a sample of adolescents, Kerig et al., (2009) found that PTSD had a positive association with experiencing an interpersonal trauma, but was not associated with experiencing a non-interpersonal trauma. Similarly, in a meta-analysis that aimed to determine the incidence of PTSD in trauma-exposed children and adolescents, Alisic and colleagues (2014) found that youth exposed to interpersonal trauma had the highest incidence of PTSD, whereas youth exposed to non-interpersonal trauma had the lowest incidence of PTSD. In their study, approximately 1 in 10 youth developed PTSD after experiencing a non-interpersonal trauma, whereas approximately 1 in 4 youth developed PTSD after experiencing an interpersonal trauma. Similarly, Frans and colleagues (2005) found that interpersonal traumas more strongly contributed to a PTSD diagnosis, and of all the traumas they examined (i.e. robbery, physical assault, sexual assault, tragic death, war, and traffic accident), only traffic accidents did not independently contribute to PTSD. It is also important to note that females tend to have higher rates of PTSD than males (Pineles, Hall, & Rasmusson, 2017; Walker, Mohr, Stein, & Seedat, 2002), although there is no definitive explanation for why that is (Olff, 2017; Tolin & Foa, 2006). In summary, interpersonal traumas have a greater impact on PTSD than non-interpersonal traumas. However, these studies did not specifically examine the

specific mechanism through which trauma may lead to PTSD, or how this mechanism may differ based on trauma type.

Untreated, PTSD is associated with other negative outcomes, including depression and anxiety (Kerig et al., 2008), alcohol and drug use (Kerig et al., 2008; Crow, Cross, Powers, & Bradley, 2014), suicidal ideation (Mazza, 2000), and non-suicidal self-injurious behavior (Weierich & Nock, 2008). Given the cumulative burden of negative symptoms and outcomes, it is important to examine PTSD in youth who experienced trauma, although examining the specific impact of PTSD on other negative outcomes is outside the scope of this study. Additionally, examining factors that help to explain the onset of PTSD is important for future treatment. For example, interpersonal problems may explain the onset of PTSD, and the differing PTSD rates in those who experienced interpersonal traumas, compared to non-interpersonal traumas.

Trauma, interpersonal problems, and PTSD.

Interpersonal problems could play a role in the development of PTSD after experiencing a trauma. Researchers have found associations between interpersonal problems and PTSD, albeit limited (Bolton et al., 2004; McLean et al., 2013). For instance, in a sample of adolescents who survived a sinking ship, PTSD symptoms were associated with impairments in friendship and social functioning (Bolton et al., 2004). Similarly, in a sample of adolescents who had a history of childhood sexual abuse, greater PTSD symptom severity was associated with worse social functioning (McLean et al., 2013). PTSD is also associated with problems with trust, closeness, and peer relationships (Beck, Grant, Clapp, & Palyo, 2008; McFarlane & Bookless, 2001; U.S. Department of Veterans Affairs, 2015). These studies support the association between interpersonal problems and PTSD in adolescents who had histories of either interpersonal and non-interpersonal traumas, however, these studies specifically suggest that PTSD leads to

interpersonal problems. Yet, these studies are cross-sectional in nature and do not specifically support a cause and effect relationship whereby the PTSD creates interpersonal problems. Additionally, although some symptoms of PTSD could directly impact interpersonal problems, trauma could also lead to interpersonal problems before one is diagnosed with PTSD. Therefore, although these studies support the association in a specific way they cannot rule out that interpersonal problems can also lead to PTSD. In addition, these studies are limited in the traumas they examined (i.e. only one specific trauma, rather than multiple traumas that fall into the interpersonal or non-interpersonal trauma types). Examining broader types of trauma (i.e. interpersonal or non-interpersonal) in relation to interpersonal problems would advance our knowledge of why PTSD rates may differ based on the type of trauma, which could help for targeting interventions based on the trauma one experienced and for improving current interventions.

The relationship between social support, an aspect of interpersonal relationships, and the development of PTSD has been examined. In adults and adolescents exposed to trauma, social support is negatively associated with PTSD. In adults, having social support is a buffer for the development of PTSD (Hyman, Gold, & Cott, 2003) and having a lack of social support is a risk factor for the development of PTSD (Brewin et al., 2000). Similar to adults, Trickey and colleagues (2012) found that low social support increased the risk for development of PTSD in adolescents exposed to non-interpersonal traumas. However, in a sample of adolescents exposed to adverse childhood experiences (i.e. interpersonal traumas), Pinto and colleagues (2017) found that social support did not reduce PTSD symptoms after controlling for other covariates (i.e. sociodemographic factors, level of exposure, comorbid anxiety, depression, and substance use, and coping strategies). While the studies that examined the influence of social support on PTSD

development support that social support buffers PTSD development in adolescents and adults (Hymna, Gold, & Cott, 2003; Trickey et al., 2012), it appears that social support does not reduce PTSD symptoms (Pinto et al., 2017). Therefore, the social support one has after the trauma occurred, but before one is diagnosed with PTSD, could impact whether or not one is diagnosed with PTSD. Similarly, interpersonal problems may play a role in the sequalae of trauma and PTSD (i.e. interpersonal problems as a risk factor for the development of PTSD). However, more research specifically examining the impact of interpersonal problems on PTSD is needed, as lack of social support does not necessarily equate to interpersonal problems.

Interestingly, researchers have found that negative social support, rather than positive social support, is more strongly related to the severity of PTSD symptoms (Andrews et al., 2003; Borja, Callahan, & Long, 2006; Zoellner et al., 1999). When examining the role of positive support, compared to negative support, in adults who were victims of physical or sexual assault, Andrews and colleagues (2003) found that the negative support was associated with greater PTSD symptoms, but positive support was not associated with less PTSD symptoms. Similarly, Borja and colleagues (2006) examined the impact of positive and negative social support on PTSD symptoms in college students who had experienced sexual assault and found that only negative social support was associated with PTSD symptoms. Additionally, Marra and colleagues (2009) examined the impact of social support and conflictual support (i.e. providers of positive social support broke promises, invaded privacy, took advantage of participant, or provoked conflict) on homeless mothers' parenting practices using longitudinal data, and they found that while social support led to greater improvements in parenting consistency over time, conflict in the support network was associated with worse discipline (i.e. greater chance of using harsh discipline). While this study did not specifically examine PTSD as an outcome, it further

supports that the negative "conflicting" relationships may play a greater role in outcomes than the positive relationships. It is possible that those negative interactions (i.e. interpersonal problems) are more strongly related to the severity of PTSD compared to the positive interactions (i.e. social support). Therefore, clarifying the role of interpersonal problems in the relationship between trauma and PTSD is an important next step.

The idea that negative interactions are more strongly related to the severity of PTSD than positive interactions is also supported by the Conservation of Resources Theory (Hobfoll, 1989). This theory postulates that resource loss is more salient than resource gain and that experiencing trauma can specifically disrupt the resources children and adolescents have. Resources include "objects, personal characteristics, conditions, or energies that are valued by individuals or serve as a means to acquire other resources" (Walter et al., 2008). Although resources can encompass a variety of things, interpersonal relationships within the personal characteristics resource, with impersonal problems constituting a resource loss, may impact one more than a resource gain (i.e. positive social support), leading to stress and PTSD. More evidence is needed to support that interpersonal problems are related to PTSD in adolescents, given the importance and uniqueness of adolescent relationships (Jellinek, Patel, & Froehle, 2002; Barber et al., 2005; Graber, Turner, & Hill, 2016), and since a majority of these studies used samples of adults (Hyman, Gold, & Cott, 2003; Brewin et al., 2000). Additionally, no study has examined the potential mediating role of interpersonal problems in the relationship between trauma and PTSD in adolescents, which could help to explain the varying rates of PTSD and has the potential to inform treatment and improve outcomes.

Trauma type, interpersonal problems, and PTSD.

Given the nature of interpersonal traumas and how they are often stigmatizing, elicit

negative responses within one's social network, and can disrupt one's fundamental principles of justice, autonomy, beneficence, and dignity (Charuvastra & Cloitre, 2008; Punamaki et al., 2005; Ford, 2017), trauma type may further influence interpersonal problems. The varying rates of interpersonal problems could further explain the higher PTSD rates in those who experienced interpersonal traumas compared to non-interpersonal traumas (Alisic et al., 2014; Kerig et al., 2009; Frans et al., 2005; Shalev & Freedman, 2005) To date, research examining this relationship is incomplete. Although research has supported an association between interpersonal and non-interpersonal traumas, interpersonal problems, and PTSD (Bolton et al., 2004; McLean et al., 2013; Beck, Grant, Clapp, & Palyo, 2008), most of that research examined interpersonal traumas (McLean et al., 2013; Beck, Grant, Clapp, & Palyo, 2008), and only one study examined non-interpersonal traumas (Bolton et al., 2004). While this study supported that adolescents, who developed PTSD after surviving a sinking ship accident had impairments in friendship and provides support for the relationship between non-interpersonal traumas and interpersonal problems, Bolton and colleagues (2004) failed to control for any potential interpersonal traumas the adolescents may have also experienced and did not examine multiple non-interpersonal traumas. Thus, more research is needed to determine a) if there even is a direct relationship between non-interpersonal traumas and interpersonal problems, b) to add to the literature that there is a relationship between interpersonal traumas and interpersonal problems, c) to examine what specific role (e.g. mediation) interpersonal problems have in the relationship between trauma and PTSD, and d) if interpersonal problems explain the varying rates of PTSD in those who experienced an interpersonal trauma compared to a non-interpersonal trauma (e.g. mediate the relationship between interpersonal trauma and PTSD, but not the relationship between non-interpersonal trauma and PTSD). To date, researchers have not examined how interpersonal

problems are related to PTSD based on trauma type; no study has used a sample of adolescents who experienced both interpersonal and non-interpersonal traumas.

Gaps in the Literature

First, the specific role interpersonal problems play in the relationship between trauma and PTSD is presently unknown. Specifically, interpersonal problems may mediate the relationship between trauma and PTSD, but to date, this relationship has not been empirically tested. However, in a prospective cohort study of maltreated and non-maltreated children, Sperry and Widom (2013) found that thirty years after experiencing childhood adversity, the maltreated individuals reported significantly lower levels of social support than the matched controls, and that lower social support mediated the relationship between childhood adversity and anxiety and depression. While this study didn't directly measure social support in predicting PTSD, it provides evidence that the social support was predictive of other negative outcomes associated with trauma. Thus, interpersonal problems may also mediate the relationship between trauma and PTSD. Additionally, previous research supports the relationship between trauma, interpersonal problems, and PTSD, but these studies are limited in that they examined the effects of PTSD on interpersonal problems, rather than the effect of interpersonal problems on PTSD (Bolton et al., 2004; McLean et al., 2013; Beck et al., 2008). Previous studies do suggest that the social interactions and relationships one has after a traumatic experience can significantly impact whether or not one develops PTSD (Hyman et al., 2003; Brewin et al., 2000; Trickey et al., 2012). Therefore, further adding to the literature on the relationship between trauma, interpersonal problems, and PTSD in adolescence would improve knowledge on PTSD in youth and inform possible interventions and treatments following trauma. This dissertation study addresses this gap by testing if interpersonal problems mediate the relationship between

childhood trauma and PTSD in a sample of trauma-exposed adolescents. Additionally, this study adds to the literature by examining the relationship between trauma, interpersonal problems, and PTSD, since research to support this relationship is limited, especially in adolescence.

Second, little is known about whether differences exist between interpersonal and non-interpersonal traumas and how they are associated with interpersonal problems and PTSD. Research supports that interpersonal traumas are associated with higher rates of PTSD compared to non-interpersonal traumas (Alisic et al., 2014; Kerig et al., 2009; Frans et al., 2005; Shalev & Freedman, 2005), but it is unclear why that is. Currently, it is known that interpersonal traumas are often stigmatizing and can disrupt one's fundamental principles of justice, autonomy, beneficence, and dignity, and sense of security (Charuvastra & Cloitre, 2008; Punamaki et al., 2005; Ford, 2017). Therefore, interpersonal traumas may be related to worse interpersonal problems than in those who experienced non-interpersonal traumas; however, research has not examined the potential difference in interpersonal problems, and how that relates to PTSD, by trauma type. Although some research has supported an association between interpersonal traumas, interpersonal problems, and PTSD (McLean et al., 2013; Beck, Grant, Clapp, & Palyo, 2008), and non-interpersonal traumas, interpersonal problems, and PTSD (Bolton et al., 2004), no study has specifically examined interpersonal and non-interpersonal traumas together. For instance, after accounting for the impact of interpersonal traumas, non-interpersonal traumas may not be related to interpersonal problems. Further, no study has tested if interpersonal problems mediate the relationship between interpersonal traumas and PTSD and the relationship between non-interpersonal traumas and PTSD. This study addressed this gap by examining the relationship between trauma type, interpersonal problems, and PTSD. Given the importance of interpersonal relationships in adolescents and the unique developmental period, examining these

relationships specifically in adolescents is imperative.

Dissertation Study

This dissertation study addressed the following gaps. First, the nature of the role interpersonal problems has in the relationship between trauma and PTSD in adolescents is unclear. This study filled this gap by testing if interpersonal problems mediated the relationship between trauma and PTSD, and by testing a model that links childhood trauma to PTSD via interpersonal problems. Second, it is not known if differences exist between interpersonal and non-interpersonal trauma, interpersonal problems, and PTSD. This study tested if interpersonal problems mediated the relationship between interpersonal trauma and PTSD, and between non-interpersonal trauma and PTSD.

These gaps were studied by conducting a secondary data analysis using the National Child Traumatic Stress Network (NCTSN) Core Data Set. This data set is ideal for examining these relationships, as it represents over 10,000 children with trauma histories who were seen in hospitals and outpatient clinics throughout the United States. Examining these relationships with a large, clinical sample of adolescents who experienced interpersonal and non-interpersonal traumas, rather than one specific trauma, has not been done, which makes this proposed analysis with this sample unique. Understanding the unique differences in these relationships is important for improving treatments and interventions for youth who experienced trauma and to help specify the best treatment option for youth who experienced trauma. Second, examining the role of interpersonal problems as a potential mediator fills a gap in the literature that has the potential to inform knowledge on the development of PTSD. Additionally, examining if interpersonal problems mediate the relationship between interpersonal trauma history and PTSD and between

non-interpersonal trauma history and PTSD, has the potential to help tailor interventions based on trauma type.

References

Achenbach, T. M. (1994). Child Behavior Checklist and related instruments.

Alisic, E., Zalta, A. K., Van Wesel, F., Larsen, S. E., Hafstad, G. S., Hassanpour, K., & Smid, G. E. (2014). Rates of post-traumatic stress disorder in trauma-exposed children and adolescents: meta-analysis. *The British Journal of Psychiatry*, *204*(5), 335-340.

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Andrews, B., Brewin, C. R., & Rose, S. (2003). Gender, social support, and PTSD in victims of violent crime. *Journal of Traumatic Stress*, *16*(4), 421-427.

Barber, B. K., Stolz, H. E., Olsen, J. A., Collins, W. A., & Burchinal, M. (2005). Parental support, psychological control, and behavioral control: Assessing relevance across time, culture, and method. *Monographs of the Society for Research in Child Development*, 70(4), i-147.

Beck, J. G., Grant, D. M., Clapp, J. D., & Palyo, S. A. (2008). Understanding the interpersonal impact of trauma: Contributions of PTSD and depression. *Journal of Anxiety Disorders*, *23*(4), 443-450.

Borja, S. E., Callahan, J. L., & Long, P. J. (2006). Positive and negative adjustment and social support of sexual assault survivors. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *19*(6), 905-914.

Borkovec, T. D., Newman, M. G., Pincus, A. L., & Lytle, R. (2002). A component analysis of cognitive-behavioral therapy for generalized anxiety disorder and the role of interpersonal problems. *Journal of Consulting and Clinical Psychology*, *70*(2), 288.

Bolton, D., Hill, J., O'ryan, D., Udwin, O., Boyle, S., & Yule, W. (2004). Long-term effects of psychological trauma on psychosocial functioning. *Journal of Child Psychology and Psychiatry*, *45*(5), 1007-1014.

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

Bücker, J., Kapczinski, F., Post, R., Ceresér, K. M., Szobot, C., Yatham, L. N., ... & Kauer-Sant'Anna, M. (2012). Cognitive impairment in school-aged children with early trauma. *Comprehensive Psychiatry*, *53*(6), 758-764.

Burack, J. A., Flanagan, T., Peled, T., Sutton, H. M., Zygmuntowicz, C., & Manly, J. T. (2006). Social perspective-taking skills in maltreated children and adolescents. *Developmental Psychology*, *42*(2), 207.

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development*, *79*(5), 1185-1229.

Cast, A. D., & Burke, P. J. (2002). A theory of self-esteem. *Social Forces*, *80*(3), 1041-1068.

Centers for Disease Control and Prevention (2010). Adverse childhood experiences reported by adults- Five states, 2009. *MMWR Morbidity Mortality Weekly Report,* 59, 1609-1613.

Charuvastra, A., & Cloitre, M. (2008). Social bonds and posttraumatic stress disorder. *Annu. Rev. Psychol.*, *59*, 301-328.

Cook, A., Spinazzola, J., Ford, J., Lanktree, C., Blaustein, M., Cloitre, M., et al. (2005). Complex trauma in children and adolescents. *Psychiatric Annals*, 35, 390–398

Crow, T., Cross, D., Powers, A., & Bradley, B. (2014). Emotion dysregulation as a mediator between childhood emotional abuse and current depression in a low-income African-American sample. *Child Abuse & Neglect*, *38*(10), 1590-1598.

DePrince, A. P., Chu, A. T., & Combs, M. D. (2008). Trauma-related predictors of deontic reasoning: A pilot study in a community sample of children. *Child Abuse & Neglect*, 32, 732–737

Dvir, Y., Ford, J. D., Hill, M., & Frazier, J. A. (2014). Childhood maltreatment, emotional dysregulation, and psychiatric comorbidities. *Harvard Review of Psychiatry*, *22*(3), 149.

Dube, S. R., Miller, J. W., Brown, D. W., Giles, W. H., Felitti, V. J., Dong, M., & Anda, R. F. (2006). Adverse childhood experiences and the association with ever using alcohol and initiating alcohol use during adolescence. *Journal of Adolescent Health*, *38*(4), 444-e1.

Elliott, G. C., Cunningham, S. M., Linder, M., Colangelo, M., & Gross, M. (2005). Child physical abuse and self-perceived social isolation among adolescents. *Journal of Interpersonal Violence*, *20*(12), 1663-1684.

Eng, W., & Heimberg, R. G. (2006). Interpersonal correlates of generalized anxiety disorder: Self versus other perception. *Journal of Anxiety Disorders*, *20*(3), 380-387.

Fang, X., Brown, D. S., Florence, C. S., & Mercy, J. A. (2012). The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse & Neglect*, *36*(2), 156-165.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., ... & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, *14*(4), 245-258.

Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2007). Polyvictimization: A neglected component in child victimization. *Child Abuse and Neglect*, 31, 7–26.

Finkelhor, D., Turner, H. A., Shattuck, A., & Hamby, S. L. (2015). Prevalence of childhood exposure to violence, crime, and abuse: Results from the national survey of children's exposure to violence. *JAMA Pediatrics*, *169*(8), 746-754.

Ford, J. (2017). Complex trauma and complex posttraumatic stress disorder in *APA Handbook of Trauma Psychology: Foundations in Knowledge, Vol. 1.* Chapter 15.

Frans. O., Rimmo, P. A., Aberg, L., Fredrikson, M. (2005). Trauma exposure and post-traumatic stress disorder in the general population. *Acta Psychiatr. Scand.* 111(4):291–99.

Goldschmidt, A. B., Sinton, M. M., Aspen, V. P., Tibbs, T. L., Stein, R. I., Saelens, B. E., ... & Wilfley, D. E. (2010). Psychosocial and familial impairment among overweight youth with social problems. *International Journal of Pediatric Obesity*, *5*(5), 428-435.

Graber, R., Turner, R., & Madill, A. (2016). Best friends and better coping: Facilitating psychological resilience through boys' and girls' closest friendships. *British Journal of Psychology, 107(2), 338–358.*

Greeson, J. K., Briggs, E. C., Layne, C. M., Belcher, H. M., Ostrowski, S. A., Kim, S., ... & Fairbank, J. A. (2014). Traumatic childhood experiences in the 21st century: broadening and building on the ACE studies with data from the National Child Traumatic Stress Network. *Journal of Interpersonal Violence*, *29*(3), 536-556.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*(3), 513.

Hoermann, S., Zupanick, C., & Dombeck, M. (2013). The most significant, defining featured of personality disorders: Interpersonal difficulties. From: https://www.mentalhelp.net/articles/the-most-significant-defining-featured-of-personality-disorders-interpersonal-difficulties/

Horowitz, L. M., Rosenberg, S. E., & Bartholomew, K. (1993). Interpersonal problems, attachment styles, and outcome in brief dynamic psychotherapy. *Journal of Consulting and Clinical Psychology*, *61*(4), 549.

Hyman, S. M., Gold, S. N., & Cott, M. A. (2003). Forms of social support that moderate PTSD in childhood sexual abuse survivors. *Journal of Family Violence*, *18*(5), 295-300.

Jellinek, M., Patel, B. P., & Froehle, M.C. (Eds.). (2002). *Bright Futures in Practice: Mental health—Volume I*. Practice guide. Arlington, VA: National Center for Education in Maternal and Child Health.

Kar, N., & Bastia, B. K. (2006). Post-traumatic stress disorder, depression and generalised anxiety disorder in adolescents after a natural disaster: a study of comorbidity. *Clinical Practice and Epidemiology in Mental Health*, *2*(1), 17.

Katz, S. J., Conway, C. C., Hammen, C. L., Brennan, P. A., & Najman, J. M. (2011). Childhood social withdrawal, interpersonal impairment, and young adult depression: a mediational model. *Journal of Abnormal Child Psychology*, *39*(8), 1227.

Kerig, P. K., Ward, R. M., Vanderzee, K. L., & Moeddel, M. A. (2009). Posttraumatic stress as a mediator of the relationship between trauma and mental health problems among juvenile delinquents. *Journal of Youth and Adolescence*, *38*(9), 1214-1225.

Kim, J., & Cicchetti, D. (2004). A longitudinal study of child maltreatment, mother–child relationship quality and maladjustment: The role of self-esteem and social competence. *Journal of Abnormal Child Psychology*, *32*(4), 341-354.

Kim, J., & Cicchetti, D. (2010). Longitudinal pathways linking child maltreatment, emotion regulation, peer relations, and psychopathology. *Journal of Child Psychology and Psychiatry*, *51*(6), 706-716.

Lakey, B., & Cronin, A. (2008). Low social support and major depression: Research, theory and methodological issues. In *Risk Factors in Depression* (pp. 385-408).

Marra, J. V., Lin, H. J., McCarthy, E., Ford, J., Rodis, E., & Frisman, L. K. (2009). Effects of social support and conflict on parenting among homeless mothers. *American Journal of Orthopsychiatry*, *79*(3), 348-356.

Mazza, J. J. (2000). The Relationship Between Posttraumatic Stress Symptomatology and Suicidal Behavior in School‐Based Adolescents. *Suicide and Life-Threatening Behavior*, *30*(2), 91-103.

McFarlane, A. C., & Bookless, C. (2001). The effect of PTSD on interpersonal relationships: Issues for emergency service workers. *Sexual and Relationship Therapy*, *16*(3), 261-267.

McLean, C. P., Rosenbach, S. B., Capaldi, S., & Foa, E. B. (2013). Social and academic functioning in adolescents with child sexual abuse-related PTSD. *Child Abuse & Neglect*, *37*(9), 675.

Moretti, M. M., Obsuth, I., Odgers, C. L., & Reebye, P. (2006). Exposure to maternal vs. paternal partner violence, PTSD, and aggression in adolescent girls and boys. *Aggressive Behavior*, *32*(4), 385-395.

Perlman, S. B., Kalish, C. W., & Pollak, S. D. (2008). The role of maltreatment experience in children's understanding of the antecedents of emotion. *Cognition & Emotion*, *22*(4), 651-670.

Petty, S. C., Sachs-Ericsson, N., & Joiner Jr, T. E. (2004). Interpersonal functioning deficits: temporary or stable characteristics of depressed individuals? *Journal of Affective Disorders*, *81*(2), 115-122.

Pinto, R. J., Morgado, D., Reis, S., Monteiro, R., Levendosky, A., & Jongenelen, I. (2017). When social support is not enough: trauma and PTSD symptoms in a risk-sample of adolescents. *Child Abuse & Neglect*, *72*, 110-119.

Poole, J. C., Dobson, K. S., & Pusch, D. (2018). Do adverse childhood experiences predict adult interpersonal difficulties? The role of emotion dysregulation. *Child Abuse & Neglect*, *80*, 123-133.

Punamäki, R. L., Komproe, I. H., Qouta, S., Elmasri, M., & de Jong, J. T. (2005). The role of peritraumatic dissociation and gender in the association between trauma and mental health in a Palestinian community sample. *American Journal of Psychiatry*, *162*(3), 545-551.

Richmond, J. M., Elliott, A. N., Pierce, T. W., Aspelmeier, J. E., & Alexander, A. A. (2009). Polyvictimization, childhood victimization, and psychological distress in college women. *Child Maltreatment*, *14*(2), 127-147.

Rose-Krasnor, L. (1997). The nature of social competence: A theoretical review. *Social Development*, *6*(1), 111-135.

Rubin, K. H., & Rose-Krasnor, L. (1992). Interpersonal problem solving and social competence in children. In *Handbook of Social Development* (pp. 283-323). Springer, Boston, MA.

Segrin, C. (2001). *Interpersonal Processes in Psychological Problems*. Guilford Press.

Shahar, G., Joiner Jr, T. E., Zuroff, D. C., & Blatt, S. J. (2004). Personality, interpersonal behavior, and depression: Co-existence of stress-specific moderating and mediating effects. *Personality and Individual Differences*, *36*(7), 1583-1596.

Shalev A., & Freedman S. (2005). PTSD following terrorist attacks: a prospective evaluation. *Am. J. Psychiatry* 162(6):1188–91

Sperry, D. M., & Widom, C. S. (2013). Child abuse and neglect, social support, and psychopathology in adulthood: A prospective investigation. *Child Abuse & Neglect*, *37*(6), 415-425.

Spinazzola, J., Ford, J. D., Zucker, M., van der Kolk, B. A., Silva, S., Smith, S. F., et al. (2005). Survey evaluates complex trauma exposure, outcome, and intervention among children and adolescents. *Psychiatric Annals*, 35, 433–439.

The National Child Traumatic Stress Network (n/d). About Child Trauma. Retrieved from: https://www.nctsn.org/what-is-child-trauma/about-child-trauma

Trickey, D., Siddaway, A. P., Meiser-Stedman, R., Serpell, L., & Field, A. P. (2012). A meta-analysis of risk factors for post-traumatic stress disorder in children and adolescents. *Clinical Psychology Review*, *32*(2), 122-138.

U.S. Department of Veterans Affairs (2015). PTSD: National Center for PTSD. *Relationships and PTSD*. Found from: https://www.ptsd.va.gov/public/family/ptsd-and-relationships.asp.

van der Kolk, B. A. (2003). The neurobiology of childhood trauma and abuse. *Child and Adolescent Psychiatric Clinics of North America*, *12*(2), 293-318.

van der Kolk, B. A. (2005). Developmental trauma disorder. Psychiatric Annals, 35, 401–408.

Vittengl, J. R., Clark, L. A., & Jarrett, R. B. (2003). Interpersonal problems, personality pathology, and social adjustment after cognitive therapy for depression. *Psychological Assessment*, *15*(1), 29.

Walter K., Hall B., & Hobfoll S. (2008) Conservation of resources theory. In G Reyes, Encyclopedia of psychological trauma. John Wiley & Sons, Hoboken, New Jersey:157–159.

Wang, C. T., & Holton, J. (2007). *Total estimated cost of child abuse and neglect in the United States* (pp. 1-5). Chicago, IL: Prevent Child Abuse America.

Weierich, M. R., & Nock, M. K. (2008). Posttraumatic stress symptoms mediate the relation between childhood sexual abuse and nonsuicidal self-injury. *Journal of Consulting and Clinical Psychology*, *76*(1), 39.

Zoellner, L. A., Foa, E. B., & Brigidi, B. D. (1999). Interpersonal friction and PTSD in female victims of sexual and nonsexual assault. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *12*(4), 689-700.

Chapter III

Methods

Purpose

This study, a secondary data analysis of cross-sectional data from the National Child Traumatic Stress Network Core Data Set, examined the relationship between trauma, interpersonal problem behaviors, and PTSD symptom severity, and further between trauma type, interpersonal problem behaviors, and PTSD symptom severity in adolescents exposed to trauma. This chapter will include a discussion of the specific aims for this study, information on the Core Data Set, study variables and measurement, and the analysis plan for this study.

Specific Aims and Hypotheses

In a clinical sample of 12-18-year-old adolescents who have a history of at least one trauma, the specific aims are as follows:

Aim 1: To examine the relationship between childhood trauma, interpersonal problems, and PTSD, and to test a model that links childhood trauma with PTSD via interpersonal problems.

Hypothesis: Experiencing a greater number of traumas will lead to greater interpersonal problems. Greater interpersonal problems will lead to greater PTSD symptom severity. Interpersonal problems will mediate the relationship between childhood trauma and PTSD.

Aim 2: To explore the relationship between childhood trauma type (interpersonal and non-interpersonal), interpersonal problems, and PTSD, and to test models that link childhood

trauma type with PTSD via interpersonal problems. Hypothesis: Experiencing a greater number of interpersonal traumas will lead to greater interpersonal problems. Greater interpersonal problems will lead to greater PTSD symptom severity. Experiencing a greater number of non-interpersonal traumas will not lead to greater interpersonal problems. Interpersonal problems will mediate the relationship between interpersonal childhood trauma and PTSD. Interpersonal problems will not mediate the relationship between non-interpersonal childhood trauma and PTSD.

In a literature review that will be conducted in addition to the proposed secondary analyses:

Aim 3: To examine the content, efficacy, and generalizability of interventions that, at least in part, focus on improving interpersonal problems in those who have experienced trauma.

Sample

The data for the analyses for Aims 1 and 2 were collected as part of a large clinical, multi-site dataset, the National Child Traumatic Stress Network (NCTSN) Core Data Set (CDS). The dataset consists of children with trauma histories who were seen in hospitals and outpatient clinics from 56 NCTSN sites throughout the United States from 2004 to 2010. The NCTSN Core Dataset is part of a quality improvement effort by NCTSN. It systematically measures demographics, trauma exposure, service utilization, client functioning, and evidence-based treatment for trauma affected youth and families. The clinical-seeking trauma-exposed sample makes it fitting for this study. De-identified data for the present study were obtained and analyzed at the UCLA-Duke University National Center for Child Traumatic Stress (NCCTS). IRB approval from the University of Michigan Health Sciences and Behavioral Sciences

Institutional Review Board was obtained. A data use agreement with the NCCTS was also executed.

A subset of the NCTSN Core Data Set was used for the present study. Inclusion criteria included adolescents: 1) between the ages of 12 and 18, 2) who have baseline trauma data available, and 3) who have a history of at least one trauma.

Measures

The following section describes the variables and measures that were used in the analyses. These are also summarized in Table 2. A substruction model with the theoretical and operational system for this study is depicted in Appendix A.

Childhood trauma.

Childhood trauma is defined as "A frightening, dangerous, or violent event that poses a threat to a child's life or bodily integrity." (The National Child Traumatic Stress Network, n/d). To measure childhood trauma, questions from the General Trauma Information Form from the Core Data Set were used that assess for twenty different trauma types someone may have experienced. Trauma types measured include sexual maltreatment/abuse, sexual assault/rape, physical maltreatment/abuse, physical assault, emotional abuse/psychological maltreatment, neglect, witnessing domestic violence in the home, having an impaired caregiver, extreme interpersonal violence, kidnapping, exposure to war/terrorism/political violence in the U.S.A., exposure to war/terrorism/political violence outside the U.S.A., illness/medical trauma, serious injury/accident that was unintentional, natural disaster, traumatic loss or bereavement, forced displacement, community violence, school violence, and other trauma not reported. Each trauma includes a definition on the form. Answers are reported as "Yes", "No", "Suspected", or "Unknown". Only answers reported as "Yes" were included for analysis. For analysis, a

summary score was created to consider the number of traumas one may have experienced and to provide more information on the relationships being examined (i.e. greater trauma exposure is associated with greater interpersonal problems).

Interpersonal trauma.

Interpersonal trauma is defined as "Trauma that occurs as a result of actions by other people" (Dvir, Ford, Hill, & Frazier, 2014). Items from the General Trauma Information Form from the Core Data Set were used. Interpersonal traumas included sexual maltreatment/ abuse, sexual assault/ rape, physical maltreatment/ abuse, physical assault, emotional abuse/ psychological maltreatment, neglect, domestic violence, war/terrorism/ political violence inside the U.S., war/terrorism/political violence outside the U.S., kidnapping, forced displacement, impaired caregiver, extreme interpersonal violence (not reported elsewhere), community violence (not reported elsewhere), school violence (not reported elsewhere). This categorization is in accordance with previous studies that have looked at interpersonal and non-interpersonal traumas (e.g. Alisic et al., 2014). For analysis, a summary score was created so that the number of interpersonal traumas one experienced could be examined (e.g. a score of 4 indicated exposure to 4 different interpersonal traumas). The score ranged from one to fifteen.

Non-interpersonal trauma.

Non-interpersonal trauma is defined as trauma that does not occur as a result of actions by other people (Dvir, Ford, Hill, & Frazier, 2014). Items from the General Trauma Information Form from the Core Data Set were used. Non-interpersonal traumas included illness/ medical trauma, serious injury/ accident, natural disaster, and traumatic loss or bereavement. This categorization is in accordance with previous studies that have looked at interpersonal and non-interpersonal traumas (Alisic et al., 2014). For analysis, a summary score was created so that the

number of non-interpersonal traumas one experienced could be examined (e.g. a score of 2 indicated exposure to 2 different non-interpersonal traumas). The score ranged from one to four.

Interpersonal problems.

Interpersonal problems are defined as problematic interpersonal relationships and difficulties relating to others, including with peers and family, that create a negative impact on one's ability to form healthy and rewarding relationships (Hoermann, Zupanick, & Dombeck, 2013; Horowitz, Rosenberg, & Bartholomew, 1993). In adolescents, interpersonal problems are identified through one's problematic relationships and interactions with peers and families. Interpersonal problems can be measured by examining problematic interpersonal behaviors. Two subscales from the Child Behavior Checklist (CBCL) that measure interpersonal problem behaviors were used to operationalize interpersonal problems: social problem behaviors and aggressive behaviors. It is important to note that specific to this study, interpersonal problems will directly be used as a term to encompass social problem behaviors and aggressive behaviors. The CBCL is completed by the parent/ caretaker that spends the most time with the child. Response options include ("0- not true (as far as you know)", "1-somewhat or sometimes true", and "2-very true or often true for the child".

Social problem behaviors are conceptualized as immature, dependent, and socially incompetent behaviors with peers and adults and are not positive or healthy relationships. The 11-item social problems subscale from the Child Behavior Checklist was used to capture social problem behaviors (Cronbach's alpha = 0.82; test-retest reliability= .90; Achenbach & Rescorla, 2001). A sample item is, "For each item that describes your child *now or within the past 6 months*… Doesn't get along with other kids". For analysis, a continuous t-score was used to determine clinical significance. A t-score less than 67 is considered normal, t-scores ranging

from 67-70 are considered borderline clinical, and t-scores greater than 70 are considered to be in the clinical range (Achenbach & Rescorla, 2001). Subscale items are reported in Appendix B.

Aggressive behaviors are conceptualized as aggressive behaviors that create problematic and poor relationships. The 18-item aggressive behavior subscale of the Child Behavior Checklist was used to capture aggressive behaviors (Cronbach's alpha = .94; test-retest reliability=.90; Achenbach & Rescorla, 2001). A sample item is, "For each item that describes your child *now or within the past 6 months*…Argues a lot". A continuous t-score was used for analysis to determine clinical significance. Subscale items are reported in Appendix B.

Post-Traumatic Stress Disorder (PTSD).

PTSD is a mental health disorder from experiencing trauma that consists of re-experiencing, avoidance, negative beliefs and feelings, and hyperarousal (American Psychiatric Association, 2013). PTSD was measured using the UCLA PTSD Reaction Index (RI) for DSM-IV, a 48-item semi-structured interview measure to assess frequency of PTSD symptoms during the past month. Although the clinician conducts the interview, symptoms are child reported. The items correlate with DSM-IV intrusion, avoidance, and arousal criteria, while also measuring fear of recurrence and trauma-related guilt. Answers are reported on a Likert scale ranging from "0-None" to "4-Most". The scale has been validated with a diverse, national sample of 6,291 children from the NCTSN Core Data Set (Cronbach's alpha= .88; Steinberg et al., 2013). Higher scores are associated with higher odds of behavioral and functional problems. For the current analyses, PTSD symptoms were treated as a continuous variable, with higher scores indicating greater PTSD symptom severity. Research on adolescent PTSD is best served by continuous ratings of PTSD symptomatology rather than diagnostic status alone (Kerig, Ward, Vanderzee, &

Moeddel, 2009), as youth frequently do not meet criteria for a full diagnosis of PTSD but still have severe symptoms that can interfere with functioning (Newman, 2002).

Socio-demographic information.

The following socio-demographic characteristics were considered for inclusion in the analyses: race (Black/ African American, White, "Other"), ethnicity (Hispanic/ Latino, Not Hispanic/ Latino, Unknown), gender (Male, Female, Other, Unknown), and public insurance status (Yes, No), an indicator of SES.

Table 2. Measures Table

Construct	Definition	Measure	# of items	Scores	Sample Item
Childhood Trauma	"A frightening, dangerous, or violent event that poses a threat to a child's life or bodily integrity." (The National Child Traumatic Stress Network, n/d).	General Trauma Information Form	20	Categorical- Yes, No, Suspected, Unknown	Has the child experienced this trauma? Impaired caregiver (History of exposure to caretaker depression, other medical illness, or alcohol/drug abuse)
Interpersonal Trauma	Trauma that occurs as a result of actions by other people (Dvir, Ford, Hill, & Frazier, 2014)	General Trauma Information Form	15	Categorical- Yes, No, Suspected, Unknown	Has the child experienced this trauma? Neglect (Physical, medical, or education neglect)
Non-interpersonal Trauma	Trauma that does not occur as a result of actions by other people (Dvir, Ford, Hill, & Frazier, 2014)	General Trauma Information Form	4	Categorical- Yes, No, Suspected, Unknown	Has the child experienced this trauma? Natural disaster (Major accident or disaster that is the result of a natural event)
Interpersonal Problems	Problematic interpersonal relationships and difficulties relating to others, including with peers and family, that create a negative impact on one's ability to form healthy and rewarding relationships (Hoermann, Zupanick, & Dombeck, 2013; Horowitz, Rosenberg, & Bartholomew, 1993)	Child Behavior Checklist- Social Problems Subscale	11	Likert Scale: 0- Not True (as far as you know), 1- Somewhat or Sometimes True, 2- Very True of Often True	"For each item that describes your child in the *now or within the past 6 months*… Doesn't get along with other kids"
		Child Behavior Checklist- Aggression Subscale	18		"For each item that describes your child in the *now or within the past 6 months*… Argues a lot"
PTSD	Posttraumatic stress disorder, a mental health problem from experiencing trauma that consists of re-experiencing, avoidance, and hyperarousal.	UCLA PTSD Index for DSM-IV	48	Likert scale: 0- None, 1- Little, 2-Some, 3-Much, 4- Most	"How much of the time during the past month"… "I have trouble feeling sadness or anger"

Analyses

All data analyses were performed using SAS 9.4 (SAS Institute Inc., 2015). See Appendix C for a detailed data analysis plan. See Appendix D for the Core Data Set variable names.

Descriptive analyses.

First, descriptive analyses were performed on the data. For the continuous variables (i.e. trauma summary score, social problems, aggressive behaviors, PTSD symptom severity, and age), the mean of the variables were determined. For the categorical variables (i.e. PTSD cutoff, public insurance, gender, race, frequency of trauma experienced), the frequencies of the variables were determined. Although for analyses a continuous score for PTSD was used, the frequency of PTSD was still determined to provide more information on the data. After determining the variable means and frequencies, correlation analyses were performed between the key variables and the demographic variables for each model. Significant correlations were considered for inclusion in the models as control variables if they aligned conceptually and with previous literature to support that relationship.

Aim 1.

The goal of aim 1 was to examine the relationship between childhood trauma, interpersonal problems and PTSD, and to test a model that links childhood trauma with PTSD via interpersonal problems (Figure 1). Path analysis was performed to test if interpersonal problems mediates the relationship between trauma and PTSD in adolescents. Path analysis is an extension of multiple regression that provides estimates of the magnitude and significance of relationships between sets of variables (Streiner, 2005). Robust Maximum Likelihood (MLR) was used for estimation.

Overall fit of the model was evaluated using Adjusted Goodness of Fit (AGFI), Root Mean Square Error of Approximation (RMSEA), and the Comparative Fit Index (CFI). Adjusted Goodness of Fit is the proportion of variance accounted for by the estimated population covariance. Values greater than .90 indicate good fit. RMSEA takes the square root of the

average or mean of the covariance residuals- the difference between corresponding elements of the observed and predicted covariance matrix. RMSEA less than .05 indicates good fit and less than .08 indicates adequate fit. CFI compares the model of interest with some alternative. CFI above .95 indicates good fit, and between .90 and .95 indicates adequate fit (Hooper, 2008). Models were re-run with different control variables to improve model fit. The model with the best fit statistics was chosen as the final model and is reported in the results section. Standardized parameter estimates and associated p values ($p < .05$) were used to determine significance of direct associations. Indirect associations were also assessed using standardized parameter estimates and associated p-values ($p<.05$). Mediation was determined by examining the direct and indirect associations (i.e. if there was a significant indirect association, but no significant direct association, full mediation was supported).

Aim 2.

The goal of aim 2 was to explore the relationship between childhood trauma type (interpersonal and non-interpersonal), interpersonal problems, and PTSD, and to test models that link childhood trauma type with PTSD via interpersonal problems. Path analyses were performed to test the relationship between trauma type, interpersonal problems, and PTSD. Multiple models were tested for this aim to create a better understanding of the differences by trauma type. First, a subset of youth who just experienced an interpersonal trauma (Figure 2) was created to examine relationships specific to youth who experienced at least one interpersonal trauma, and no non-interpersonal traumas. Next, a subset of youth who just experienced a non-interpersonal trauma (Figure 3) was created to examine relationships specific to youth who experienced at least one non-interpersonal trauma, and no interpersonal traumas. Third, a sample of youth who

experienced any interpersonal trauma, non-interpersonal trauma, or both (Figure 4) was used to compare both trauma types in one model.

Similar to Aim 1, path analyses were used for each model. Model fit was also evaluated using the AGFI, RMSEA, and CFI as in Aim 1. Models were re-run with different control variables to improve model fit. In addition to improving model fit with control variables in the model, the models were also compared to each other by evaluating model fit. For each model, the model with the best fit statists was chosen as the final model and is reported in the results section. Standardized parameter estimates and associated p-values ($p<.05$) were used to determine significant direct and indirect associations. Mediation was determined by examining direct and indirect associations similar to Aim 1.

Power analysis.

Based on the aims and results, the most complex model was Model 4 (Aim 2, Figure 4-Model 4), which included fourteen variables. In order to determine the sample size needed to achieve a certain power, the degrees of freedom is needed:

# of variances & covariances= $[p*(p+1)]/2= [14*(14+1)]/2= 105$ variances & covariances

# of parameters= $[k^2-k]/2= [14^2-14]/2= 91$ parameters

df= (# of variances and co-variances) – (# of parameters) = 105-91= 14 df

This model had fourteen degrees of freedom. For fourteen degrees of freedom, the minimum sample size needed to achieve a power of .80 for a good fitting model (RMSEA $\leq .05$) is 598 participants (MacCallum, Browne, & Sugawara, 1996). Statistical power is the probability of rejecting the null hypothesis when it is false (i.e. not making a type II error; Cohen, 1988). It is estimated that there are over 2,500 participants for this model, which provides adequate power for the analysis.

Figure 1. Model 1

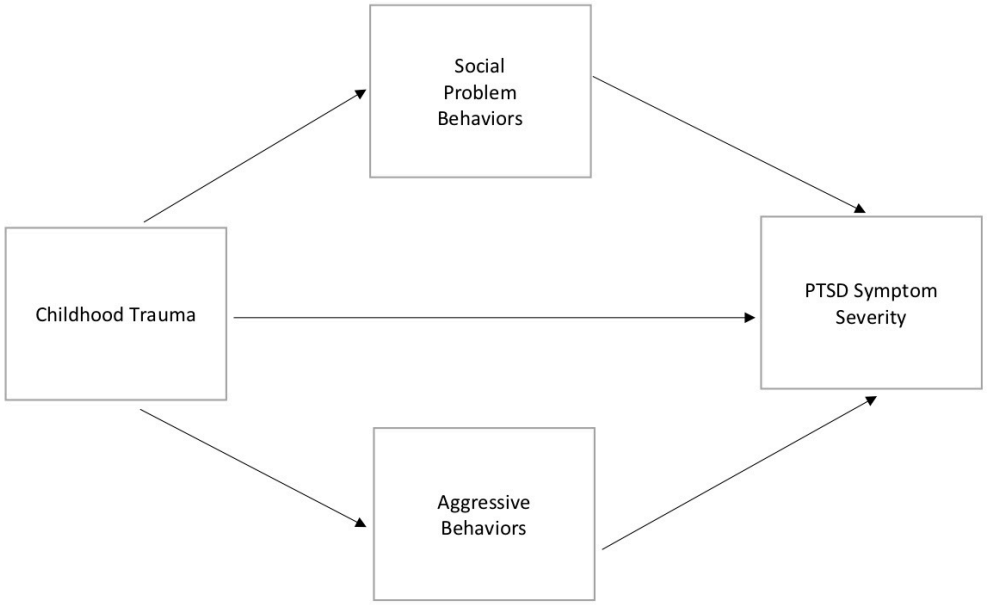


Figure 2. Model 1

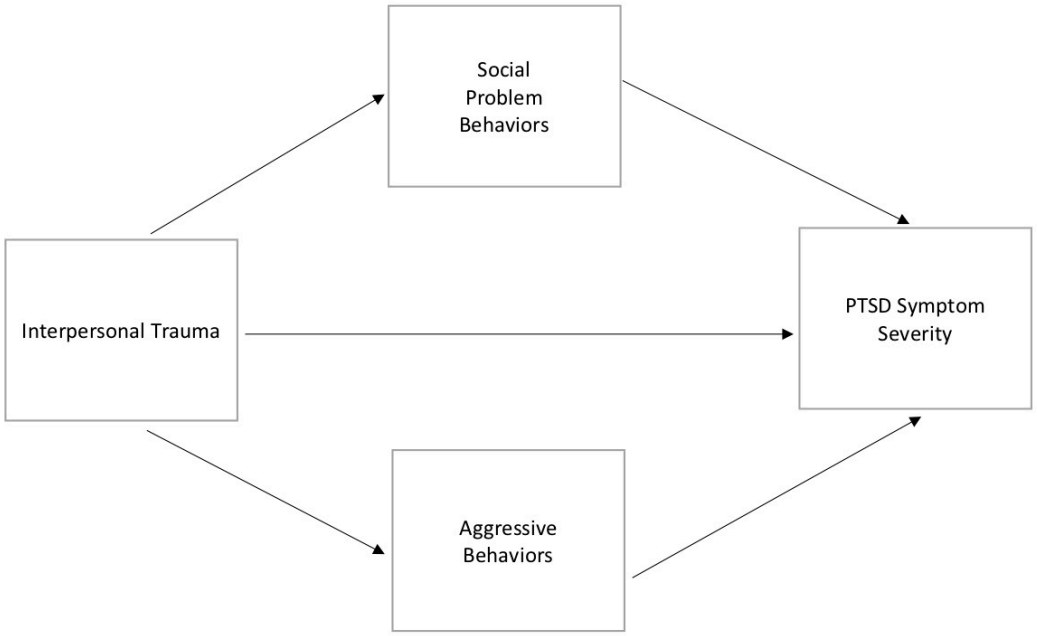


Figure 3. Model 3

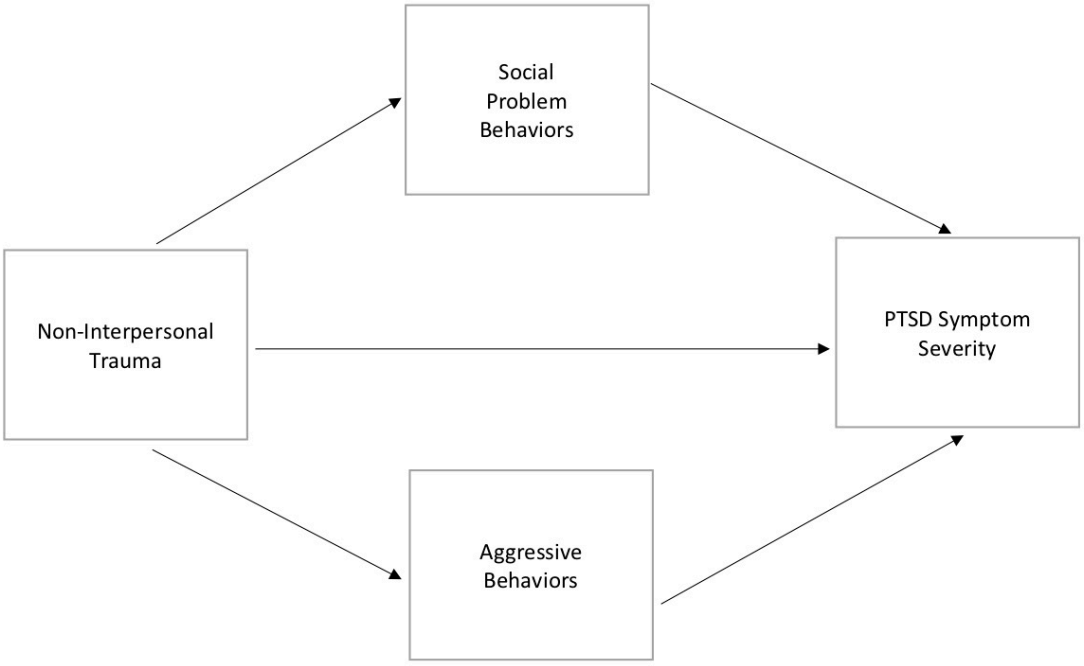
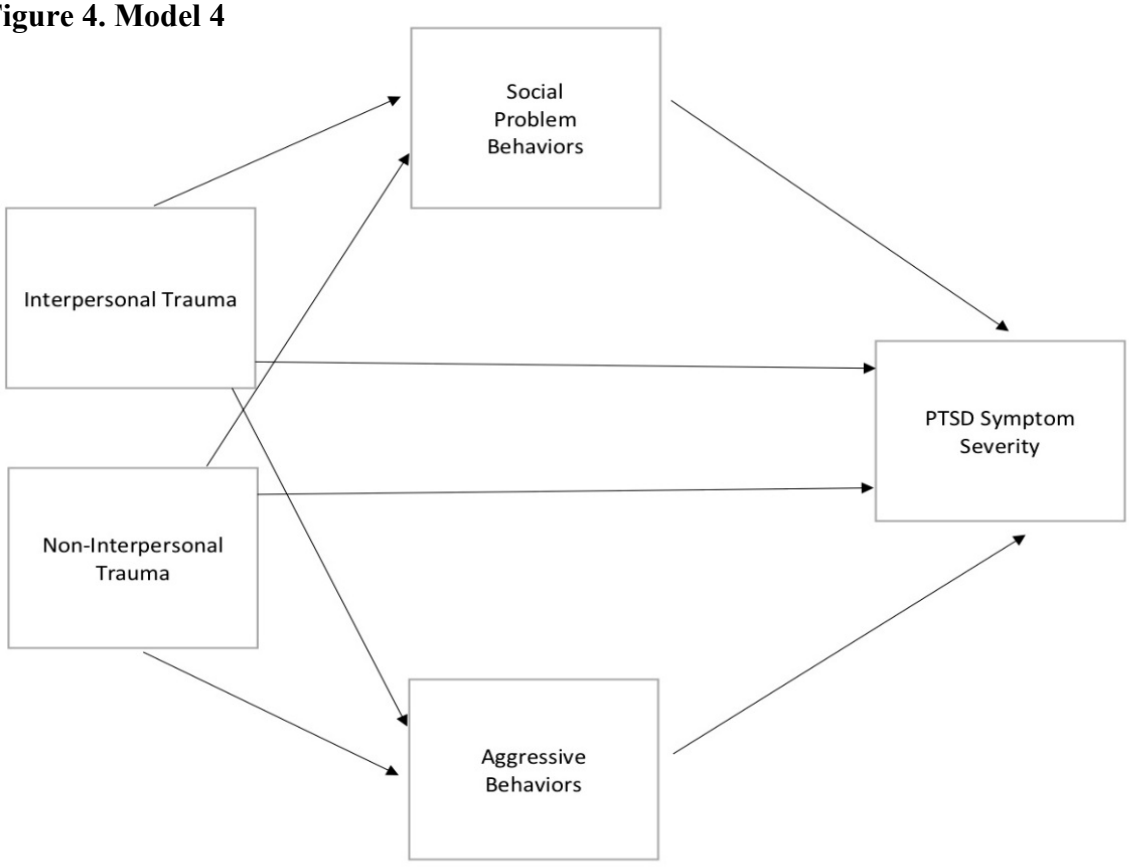


Figure 4. Model 4



Aim 3.

The goal of aim 3 is to examine the content, efficacy, and generalizability of interventions that, at least in part, focus on improving interpersonal problems in those who have experienced trauma. To address this aim, a scoping review was conducted. Chapter 5 provides more information on the search strategy and results.

Summary

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist is reviewed below to summarize the methodological component of this study (von Elm, Altman, Egger, Pocock, Gøtzsche, & Vandenbroucke**,** 2008). Although the STROBE is a tool designed to improve the quality of results reported for observational studies and not for conducting research, it can aid investigators in how studies will be reported while in the design phase. Considering this, each of the elements of the STROBE checklist, excluding abstract, results, and conclusions, are discussed in Tables 3, 4, and 5 below.

Table 3. STROBE Statement

	Item No	Recommendation	How project addresses STROBE checklist
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Chapter 2 reviews relevant background literature on childhood trauma, interpersonal and non-interpersonal trauma, interpersonal problems, and PTSD. It also reviews gaps in the literature and why this study is important for future research.
Objectives	3	State specific objectives, including any prespecified hypotheses	The purpose of the study and specific aims are stated.
Methods			
Study design	4	Present key elements of study design early in the paper	The methods and analysis section discuss the study design.

Table 4: STROBE Statement Continued

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	The analysis plan discusses how the variables will be used in each path analysis. Table 1 displays how each variable is measured and how scoring will be used in the analysis.
Participants	6	(a) Cohort study—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up Case-control study—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants	The inclusion criteria are specified in the methods section (1) children must be between the ages of 12 and 18, 2) have baseline trauma data available, 3) have a history of at least one trauma). Those that meet these criteria from the NCTSN Core Data Set will be included in the study.
		(b) Cohort study—For matched studies, give matching criteria and number of exposed and unexposed Case-control study—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	The measures section identifies all variables that will be used. Each path model illustrates the predictor/ outcome variables for each aim. The diagnostic criteria used are the *DSM-IV* criteria for PTSD.
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Table 1 identifies all measures and the conceptual meaning of each variable.
Bias	9	Describe any efforts to address potential sources of bias	A large, clinical dataset will be used. Multiple imputation will be used if need be (>10% missing data) to reduce bias with missing data.

Table 5: STROBE Statement Continued

Study size	10	Explain how the study size was arrived at	Power analysis was used to identify the greatest possible sample needed to meet power. The sample size is much larger than this number (estimated sample size > 2,500).
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	The analysis plan discusses how the variables will be used in each path analysis. Table 1 displays how each variable is measured and how scoring will be used in the analysis.
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	The statistical methods for each aim are described in the analysis section.
		(b) Describe any methods used to examine subgroups and interactions	Different subgroups will be used for analyzing the second aim and is discussed in the analyses section.
		(c) Explain how missing data were addressed	N/A
		(d) Cohort study—If applicable, explain how loss to follow-up was addressed Case-control study—If applicable, explain how matching of cases and controls was addressed Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	N/A
		(e) Describe any sensitivity analyses	This study will not have sensitivity analyses.

References

Achenbach, T. M., & Rescorla, L. (2001). ASEBA school-age forms & profiles.

Alisic, E., Zalta, A. K., Van Wesel, F., Larsen, S. E., Hafstad, G. S., Hassanpour, K., & Smid, G. E. (2014). Rates of post-traumatic stress disorder in trauma-exposed children and adolescents: meta-analysis. *The British Journal of Psychiatry*, *204*(5), 335-340.

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Cohen J. Statistical power analysis for the behavioral sciences. Hillsdale, NJ: Erlbaum; 1988.

Dvir, Y., Ford, J. D., Hill, M., & Frazier, J. A. (2014). Childhood maltreatment, emotional dysregulation, and psychiatric comorbidities. *Harvard Review of Psychiatry*, *22*(3), 149.

Hoermann, S., Zupanick, C., & Dombeck, M. (2013). The most significant, defining featured of personality disorders: Interpersonal difficulties. From: https://www.mentalhelp.net/articles/the-most-significant-defining-featured-of-personality-disorders-interpersonal-difficulties/

Horowitz, L. M., Rosenberg, S. E., & Bartholomew, K. (1993). Interpersonal problems, attachment styles, and outcome in brief dynamic psychotherapy. *Journal of Consulting and Clinical Psychology*, *61*(4), 549.

Hooper, D., Coughlan, J., Mullen, M. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. Electronic Journal of Business Research Methods, 6(1), 53-60.

Kerig, P. K., Ward, R. M., Vanderzee, K. L., & Moeddel, M. A. (2009). Posttraumatic stress as a mediator of the relationship between trauma and mental health problems among juvenile delinquents. *Journal of Youth and Adolescence*, *38*(9), 1214-1225.

Klein, R.B. (1998). Principles and Practice of Structural Equation Modeling. New York: Guilford.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, *1*(2), 130.

Newman, E. (2002). Assessment of PTSD and trauma exposure in adolescents. *Journal of Aggression, Maltreatment & Trauma*, *6*(1), 59-77.

SAS Institute Inc. (2015). SAS/STAT® 14.1 User's Guide. Cary, NC: SAS Institute Inc.

Steinberg, A. M., Brymer, M. J., Kim, S., Briggs, E. C., Ippen, C. G., Ostrowski, S. A., ... & Pynoos, R. S. (2013). Psychometric properties of the UCLA PTSD reaction index: part I. *Journal of Traumatic Stress*, *26*(1), 1-9.

Streiner, D. (2005). Finding our way: An introduction to path analysis. *Canadian Journal Psychiatry.*

The National Child Traumatic Stress Network (n/d). About Child Trauma. Retrieved from: https://www.nctsn.org/what-is-child-trauma/about-child-trauma

von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P.C., Vandenbroucke, J.P. (2008); STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Journal Clinical Epidemiology*:344-9. PMID: 1831355.

Chapter IV

Statistical Results

Overview

The purpose of Chapter IV is to present the results of the statistical analyses corresponding to study aims 1 and 2. The specific aims of this study were to:

1) To examine the relationship between childhood trauma, interpersonal problems, and PTSD, and to test a model that links childhood trauma with PTSD via interpersonal problems.

2) To explore the relationship between childhood trauma type (interpersonal and non-interpersonal), interpersonal problems, and PTSD, and to test models that link childhood trauma type with PTSD via interpersonal problems.

This chapter begins with a description of demographic characteristics of the sample used for the analyses, prevalence of trauma types in the sample, and frequencies of the variables measured. Results of the model examining the relationship between childhood trauma, interpersonal problems, and PTSD are presented (Aim 1). Results of the models examining the relationship between trauma type (interpersonal and non-interpersonal), interpersonal problems, and PTSD are presented (Aim 2).

Descriptive Results

Socio-demographic characteristics.

The socio-demographic characteristics of the study sample are reported in Table 6. Based on the inclusion criteria, all youth included in the sample experienced at least one trauma (M=

4.1, SD= 2.6), and were between 12 and 18 years old (M= 14.8, SD= 1.7). Over half (60.4%) of the sample was female. The sample was racially/ ethnically diverse (34.7% White, 24.7% Black, 34.5% Hispanic, and 6.1% "Other"). The majority of the sample used public insurance, an indicator of low socio-economic status (59.6%).

Table 6. Sample Socio-Demographic Characteristics

	Total N=4,621
Age, M (SD)	14.8 (1.7)
Female	2,789 (60.4%)
Male	1,832 (39.6%)
Race/Ethnicity	
White	1,546 (34.7%)
Black	1,100 (24.7%)
Hispanic or Latino	1,533 (34.5%)
"Other" race	271 (6.1%)
Insurance	
Private	552 (11.9%)
Public	2752 (59.6%)
Both	62 (1.3%)
None Reported	1,255 (27.2%)
Number of Trauma Types, M (SD)	4.1 (2.6)

Trauma type prevalence.

The prevalence of different trauma types experienced by the sample is reported in Table 7. Traumatic loss or bereavement was the most frequently reported trauma overall (54.8%), and the most frequently reported non-interpersonal trauma. The most frequently reported

interpersonal trauma was witnessing domestic violence (46.9%). The trauma type that was reported least frequently was war, terrorism, or political violence inside the United States (1.4%).

Table 7. Prevalence of Trauma Types

Total N= 4,621		
Interpersonal Traumas*	N	%
Domestic Violence	2168	(46.9%)
Emotional abuse/ Psychological Maltreatment	1919	(41.5%)
Impaired Caregiver	1860	(40.3%)
Physical maltreatment/abuse	1514	(32.8%)
Neglect	1252	(27.1%)
Sexual maltreatment/abuse	1154	(25%)
Community Violence	1104	(23.9%)
Sexual assault/rape	1000	(21.6%)
School Violence	857	(18.5%)
Physical assault	741	(16%)
Extreme Interpersonal Violence	375	(8.1%)
Kidnapping	114	(2.5%)
Forced Displacement	97	(2.1%)
War/Terrorism/PV outside U.S.	77	(1.7%)
War/Terrorism/PV inside the U.S.	63	(1.4%)
Non-Interpersonal Traumas*		
Traumatic Loss or Bereavement	2531	(54.8%)
Serious Injury/Accident	657	(14.2%)
Illness/Medical	514	(11.1%)
Natural Disaster	315	(6.8%)

Note. Items are not mutually exclusive

PTSD symptoms.

Post-Traumatic Stress Disorder symptoms based on the UCLA PTSD-RI are presented in Table 8. A majority of the sample met criteria for the re-experiencing/ intrusion symptom cluster

(74.6%), about half of the sample met criteria for the avoidance symptom cluster (52.3%), and a majority of the sample met criteria for the hyperarousal symptom cluster (75.9%). About one quarter of the sample met full PTSD diagnostic criteria (24.3%).

Table 8. Frequencies of UCLA PTSD-RI Subscales and Total

Total N= 3,829				
UCLA PTSD-RI Subscales	Raw Scores M, SD		Criteria Met N, %	
Re-experiencing/Intrusion	7.34	0.09	2,856	(74.6%)
Avoidance	9.76	0.11	2,004	(52.3%)
Hyperarousal	9.19	0.08	2,907	(75.9%)
Total Scale Score	26.04	0.24	973	(24.3%)

Model Results

Aim 1: Trauma, interpersonal problems, and PTSD.

Model 1: The first model examined the relationship between general trauma, interpersonal problems, and PTSD symptom severity for the full sample (n= 2,771). It is important to note that the sample for this model is less than the sample for the overall demographic characteristics due to limitations in reported CBCL and PTSD data, and missing data. Descriptive statistics and correlations are depicted in Table 9. Trauma was associated with higher interpersonal problem behaviors and higher PTSD symptom severity. The average aggressive behavior t- score was in the normal range (M= 63.23, SD= 10.8). The average social problems t-score was in the normal range (M= 61.37, SD= 9.05). For this sample, the average number of trauma types observed was 4.08 traumas.

The model is depicted in Figure 5. The model included demographic characteristics that were significantly correlated with study variables. The model fit the data well (RMSEA= .0222, CFI= .9944, AGF=.9915). Estimates, standard error, and significance of the paths for direct and indirect effects are listed in Table 10. Experiencing a greater number of traumas was associated

with higher social problem behaviors, higher aggressive behaviors, and higher PTSD symptom severity. Higher social problem behaviors were associated with greater PTSD symptom severity scores. Trauma contributed directly to PTSD symptom severity and indirectly to PTSD symptom severity through social problem behaviors ($p < .05$; i.e. partial mediation). Aggressive behaviors were not associated with PTSD symptom severity.

Females had higher PTSD symptom severity than males (b= .23). Youth on public insurance had higher social problem behaviors (b= .04). Youth who were Black had fewer social problem behaviors (b= -.06). Youth who were Hispanic had lower aggressive behavior problems (b= -.02). Youth on public insurance had higher aggressive behavior problems (b= .04). Females experienced a higher number of traumas than males (b= .11). Youth who were "Other" race were exposed to a higher number of traumas (b= .04). Youth on public insurance were exposed to a higher number of traumas (b= .22). Youth who were Black were exposed to less trauma (b= -.11).

Table 9. Descriptive Statistics and Correlation Table for Variables in Model 1.
Means and standard deviations are reported for continuous variables. Frequencies are reported for categorical variables. Correlations are reported for all variables. N= 2771.

	M	SD	Frequency	1	2	3	4	5	6	7	8	9
1. PTSD	26.04	15.01	-	-								
2. Aggressive Behavior t-score	63.23	10.8	-	**.13****	-							
3. Social Problems t-score	61.37	9.05	-	**.20****	**.63****	-						
4. Trauma Summary Score	4.08	2.63	-	**.22****	**.15****	**.17****	-					
5. Female	-	-	60%	**.24****	-.03	.02	**.11****	-				
6. Black	-	-	24%	-.02	-.001	**-.06****	**-.09****	-.02	-			
7. Hispanic	-	-	33%	-.01	**-.06****	-.02	-.02	-.02	**-.39****	-		
8. “Other” race	-	-	6%	.01	.01	-.01	.07**	.02	**-.14****	**-.18****	-	
9. Public insurance	-	-	60%	-.004	**.07****	**.07****	**.07****	-.10	**.08****	-.03	-.006	-

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

Figure 5. Model 1- General Trauma Summary Score Model
(i.e. summary score of individuals who experienced all trauma types; n=2771). Standardized results (i.e. betas) are included. Solid lines represent significant direct pathways; dotted lines represent non-significant pathways.

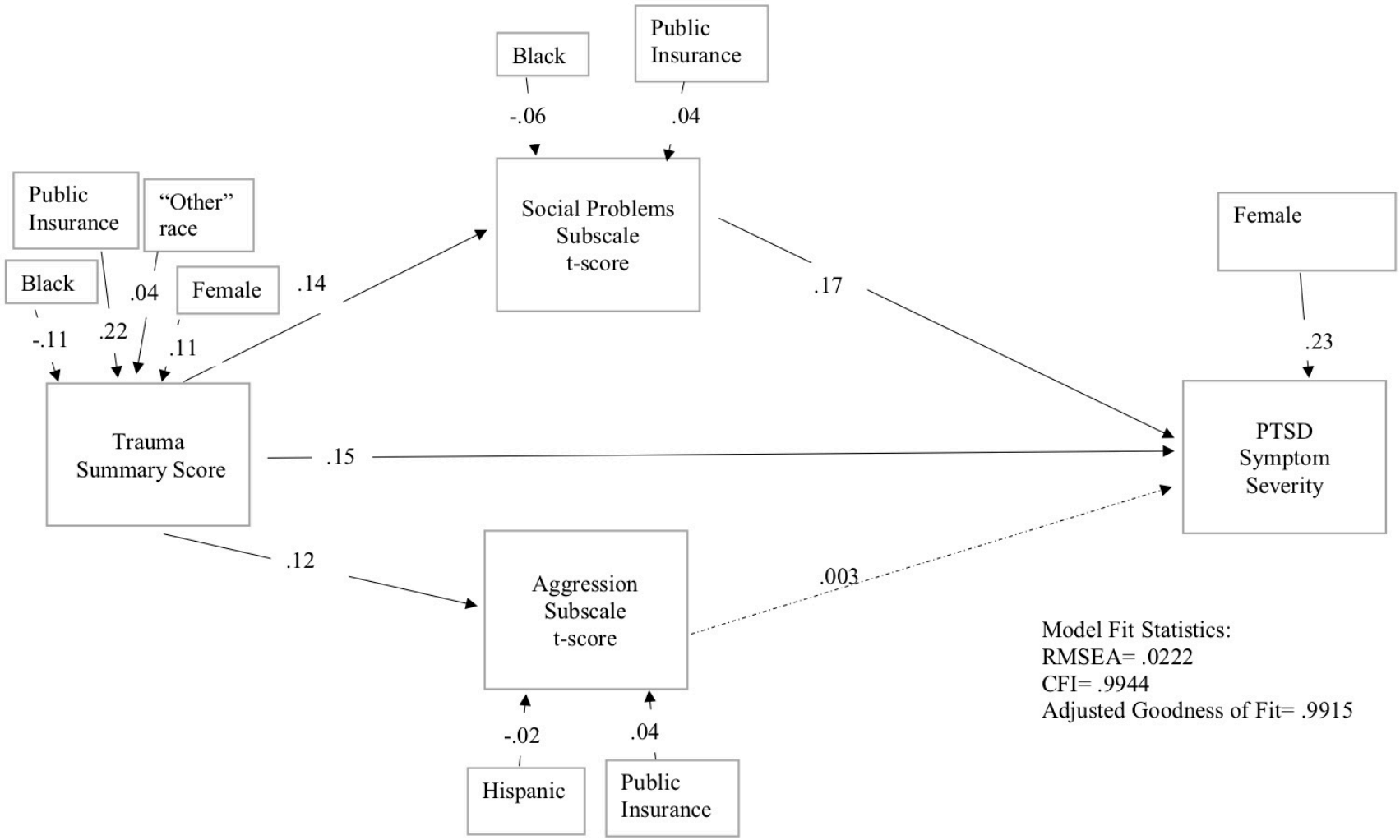


Table 10. Results of General Trauma Summary Score Model

Total N=2,771		
Direct effects	b (SE)	Standardized results Estimate (SE)
Social problems →PTSD	**.28 (.04)****	**.17 (.02)****
Aggression → PTSD	.005 (.03)	.003 (.02)
Trauma → PTSD	**.84 (.10)****	**.15 (.02)****
Trauma → social problems	**.49 (.07)****	**.14 (.02)****
Trauma → aggression	**.49 (.08)****	**.12 (.02)****
Total direct effects on PTSD	**.84 (.10)****	**.15 (.02)****
Control variables		
Female → PTSD	**7.09 (.55)****	**.23 (.02)****
Black → social problems	**-1.28 (.32)***	**-.06 (.02)***
Public insurance → social problems	**.67 (.35)***	**.04 (.02)***
Public insurance → aggression	**.86 (.42)***	**.04 (.02)***
Hispanic → aggression	**-.36 (.36)***	**-. 02 (.02)***
Female → trauma	**.60 (.09)****	**.11 (.02)****
Black → trauma	**-.68 (.11)****	**-.11 (.02)****
"Other" race → trauma	**.52 (.22)***	**.04 (.02)***
Public insurance → trauma	**1.18 (.10)****	**.22 (.02)****
Indirect effects		
Total indirect effects Trauma on PTSD	**.14 (.02)***	**.03 (.004)***

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

Aim 2: Trauma type, interpersonal problems, and PTSD.

Model 2: The second model examined the relationship between interpersonal trauma, interpersonal problems, and PTSD. This model included a subset of youth who only experienced one or more interpersonal traumas (n = 926). Descriptive statistics and correlations are depicted in Table 11. Interpersonal trauma was associated with higher interpersonal problem behaviors. For this subsample, the average number of interpersonal trauma types reported was 2.84 traumas. The average aggressive behavior t-score was in the normal range (M= 62.86, SD= 10.74). The average social problems t-score was in the normal range (M= 60.83, SD= 9.20).

The model is depicted in Figure 6. The model included demographic characteristics that were significantly correlated with study variables. The model fit the data well (RMSEA= .0248, CFI=.9849, AGF= .9943). Estimates, standard error, and significance of the paths for direct and indirect effects are listed in Table 13. Experiencing a greater number of interpersonal traumas was associated with higher social problem behaviors and aggressive behaviors. Higher social problem behaviors were associated with higher PTSD symptom severity. Interpersonal trauma was not directly associated with PTSD symptom severity, but did contribute indirectly to PTSD symptom severity through social problem behaviors ($p<.05$; i.e. full mediation).

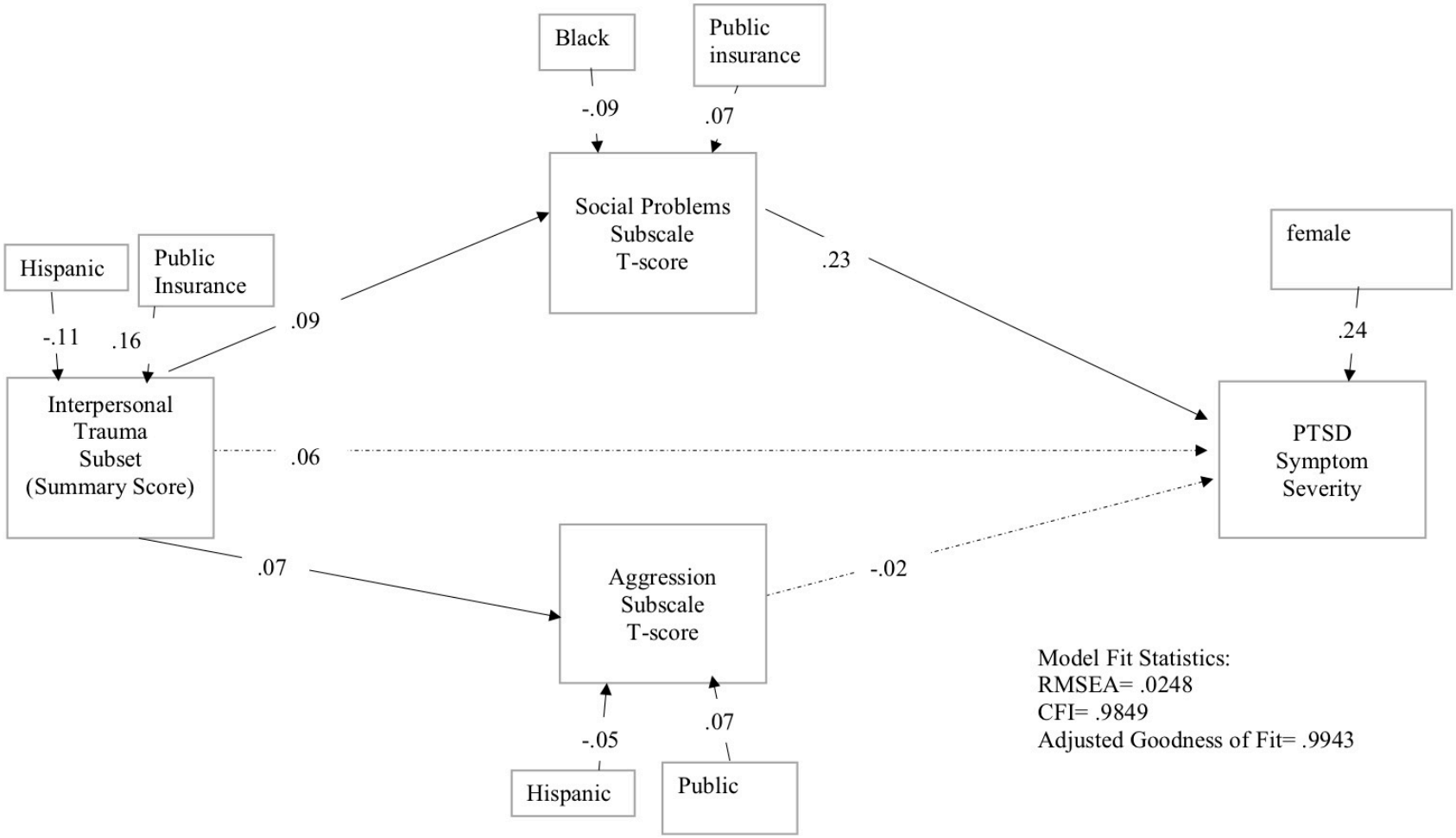
Females had higher PTSD symptom severity than males (b= .24). Youth on public insurance had higher social problem behaviors (b= .07). Youth who were Black had fewer social problem behaviors (b= -.09). Youth who were Hispanic had fewer aggressive behaviors (b= -.05). Youth on public insurance had higher aggressive behaviors (b= .07). Youth on public insurance were exposed to a higher number of interpersonal traumas (b= .16). Youth who were Hispanic were exposed to less interpersonal traumas (b= -.11).

Table 11. Descriptive Statistics and Correlation Table for Variables in Model 2.
Means and standard deviations are reported for continuous variables. Frequencies are reported for categorical variables. Correlations are reported for all variables. N= 926.

	M	SD	Frequency	1	2	3	4	5	6	7	8	9
1. PTSD	25.36	15.23	-	-								
2. Aggressive Behavior t-score	63.91	10.78	-	**.13****	-							
3. Social Problems t-score	60.84	9.18	-	**.23****	**.64****	-						
4.Interpersonal trauma	2.86	1.85	-	**.15****	**.11****	**.11****	-					
5. Female	-	-	62%	**.23****	-.03	.04	**.06***	-				
6. Black	-	-	24%	-.02	-.02	**-.11****	.007	-.01	-			
7. Hispanic	-	-	34%	-.04	**-.09****	-.02	**-.11****	.005	**-.40****	-		
8. “Other” race	-	-	6%	-.008	-.006	.03	.03	.007	**-.13****	**-.18****	-	
9. Public insurance	-	-	55%	-.02	**.09****	**.08***	**.17****	-.02	**.11****	-.04	-.01	-

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

Figure 6. Model 2- Interpersonal Trauma Subset Model
(i.e., only individuals who reported interpersonal trauma included in the model; n= 926). Standardized results (i.e. betas) are included. Solid lines represent significant direct pathways; dotted lines represent non-significant pathways.



Model 3: The third model examined the relationship between non-interpersonal trauma, interpersonal problems, and PTSD. This model includes a subset of the sample of youth who only experienced one or more non- interpersonal traumas (n= 233). Descriptive statistics and correlations are depicted in Table 12. For this subsample, the average number of non-interpersonal trauma types observed was 1.25 traumas. The average aggressive behavior t-score was in the normal range (M= 61.73, SD= 10.44). The average social problems t-score was in the normal range (M= 59.82, SD= 8.61).

The model is depicted in Figure 7. The model included demographic characteristics that were significantly correlated with study variables. The model fit the data well (RMSEA=.0485, CFI= .9839, AGF=.9542). Estimates, standard error, and significance of the paths for direct and indirect effects are listed in Table 13. There were no significant associations, direct or indirect, between non-interpersonal trauma, social problem behaviors, aggressive behaviors, and PTSD symptom severity for individuals who reported only experiencing non-interpersonal traumas (i.e. no mediation). Females had higher PTSD symptom severity than males (b= .22).

Table 12. Descriptive Statistics and Correlation Table for Variables in Model 3.
Means and standard deviations are reported for continuous variables. Frequencies are reported for categorical variables. Correlations are reported for all variables. N= 233.

	M	SD	Frequency	1	2	3	4	5	6	7	8	9
1. PTSD	21.33	13.95	-	-								
2. Aggressive Behavior t-score	59.57	8.72	-	**.19****	-							
3. Social Problems t-score	59.57	8.72	-	**.14****	**.60****	-						
4.Non-interpersonal trauma	1.18	.45	-	-.03	-.05	.03	-					
5. Female	-	-	43%	**.22****	-.002	.007	.04	-				
6. Black	-	-	33%	.02	.05	.05	.04	.03	-			
7. Hispanic	-	-	26%	-.06	-.05	-.04	.009	.008	**-.43****	-		
8. "Other" race	-	-	5%	-.08	-.09	-.02	-.06	.05	**-.15****	**-.13***	-	
9. Public insurance	-	-	50%	-.03	.09	**.17****	.03	-.01	**.22****	.04	**-.12***	-

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

Figure 7. Model 3- Non-Interpersonal Trauma Subset Model
(i.e., only individuals who reported non-interpersonal trauma included in the model; n=233). Standardized results (i.e. betas) are included. Solid lines represent significant direct pathways; dotted lines represent non-significant pathways.

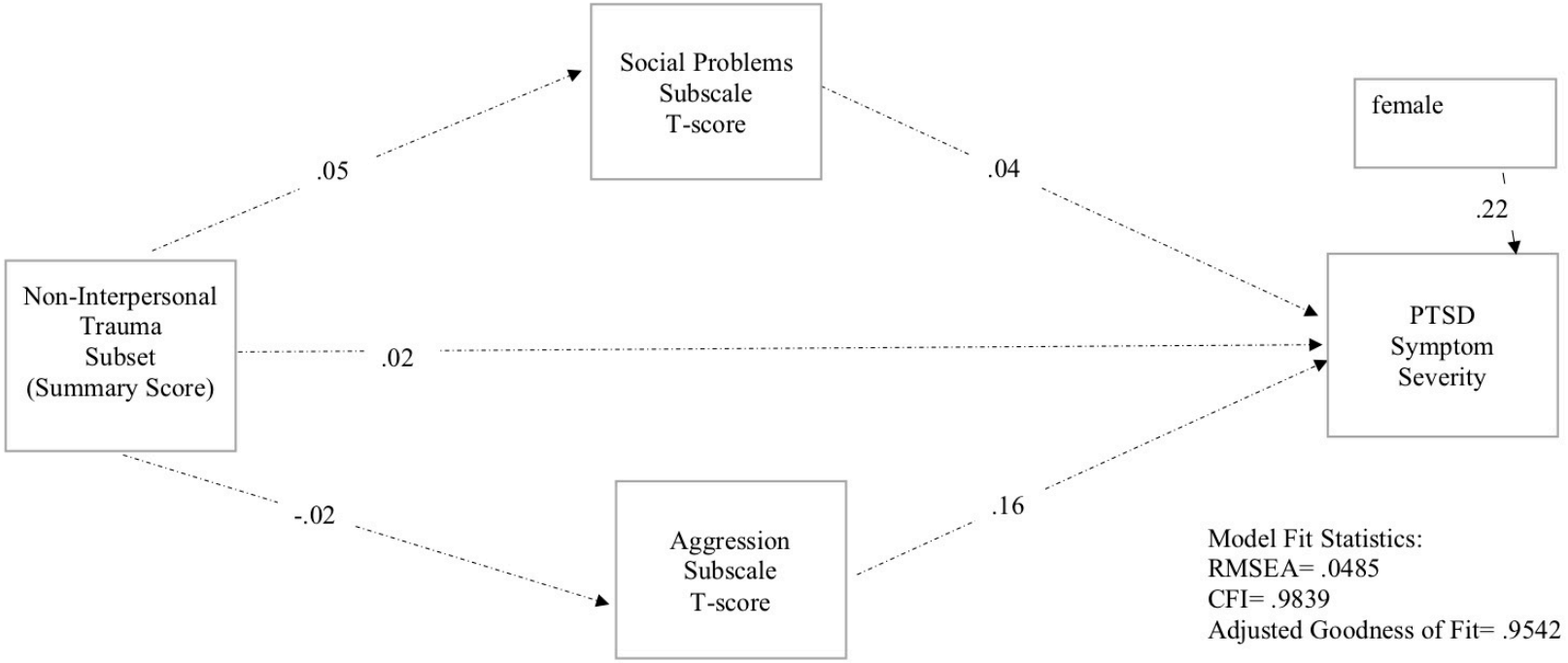


Table 13. Results of the Interpersonal and Non-Interpersonal Trauma Subset Models

Interpersonal Trauma only (n = 926) (See Figure 6)			Non-interpersonal trauma only (n = 233) (See Figure 7)		
Direct effects	b (SE)	Standardized Results Estimate (SE)	**Direct effects**	b (SE)	Standardized Results Estimate (SE)
Social problems → PTSD	**.38 (.07)****	**.23 (.04)****	Social problems → PTSD	.06 (.13)	.04 (.08)
Aggression → PTSD	-.02 (.06)	-.02 (.04)	Aggression → PTSD	.02 (.11)	.16 (.08)
Interpersonal trauma → PTSD	.47 (.26)	.06 (.03)	Non-interpersonal trauma → PTSD	.47 (1.76)	.02 (.06)
Interpersonal trauma → social problems	**.45 (.16)***	**.09 (.03)***	Non-interpersonal trauma → social problems	.88 (1.12)	.05 (.07)
Interpersonal trauma → aggression	**.42 (.19)***	**.07 (.03)***	Non-interpersonal trauma → aggression	-.45 (1.36)	-.02 (.06)
Total direct effects on PTSD	.40 (.27)	.05 (.03)	Total direct effects on PTSD	.47 (1.76)	.02 (.06)
Control variables			*Control variables*		
Female → PTSD	**7.67 (.98)****	**.24 (.03)****	Female → PTSD	**6.27 (1.77)***	**.22 (.06)***
Public insurance → social problems	**1.28 (.61)***	**.07 (.03)***			
Black → social problems	**-1.8 (.54)****	**-.09 (.03)****			
Public insurance → aggression	**1.46 (.71)***	**.07 (.03)***			
Hispanic → aggression	**-1.08 (.58)***	**-.05 (.03)***			
Hispanic → interpersonal trauma	**-.44 (.13)****	**-.11 (.03)****			

Public insurance → interpersonal trauma	**.61 (.12)****	**.16 (5.13)****			
Indirect effects			**Indirect effects**		
Total indirect effects on PTSD	**.16 (.07)***	**.02 (.008)***	Total indirect effects on PTSD	-.05 (.38)	-.0016 (.01)

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

Model 4: The fourth model examined the relationship between interpersonal trauma, interpersonal problems and PTSD, and between non-interpersonal trauma, interpersonal problems and PTSD together in the same model. This model includes youth who experienced any interpersonal or non-interpersonal trauma, or both (n= 2692). Descriptive statistics and correlations are depicted in Table 14. Interpersonal trauma was associated with higher social problem behaviors, higher aggressive behaviors, and higher PTSD symptom severity. For this model, the average number of interpersonal trauma types observed was 3.09 traumas, and the average number of non-interpersonal trauma types observed was .88 traumas. The average aggressive behavior t- score was in the normal range (M= 63.44, SD= 10.99). The average social problems t-score was in the normal range (M= 61.51, SD= 9.18).

The model is depicted in Figure 8. The model included demographic characteristics that were significantly correlated with study variables. The model fit the data well (RMSEA= .0437, CFI= .9713, AGF= .9751). Estimates, standard error, and significance of the paths for direct and indirect effects are listed in Table 15. Experiencing a greater number of interpersonal traumas was associated with higher social problem behaviors, higher aggressive behaviors, and higher PTSD symptom severity. Higher social problem behaviors were associated with higher PTSD symptom severity. Interpersonal trauma contributed directly to PTSD symptom severity and indirectly to PTSD symptom severity through social problem behaviors ($p < .01$; i.e. partial mediation). Aggression was not associated with PTSD symptom severity. There were no significant associations, direct or indirect, between non-interpersonal trauma, social problem behaviors, aggressive behaviors, and PTSD symptom severity.

Females had higher PTSD symptom severity than males (b= .23). Youth on public insurance had higher social problem behaviors (b= .04). Youth who were black had fewer social

problem behaviors (b= -.06). Youth on public insurance had higher aggressive behaviors (b= .04). Youth on public insurance experienced a higher number of interpersonal traumas (b= .19). Youth of "Other" race experienced a higher number of interpersonal traumas (b= .04). Youth who were Black experienced less interpersonal traumas (b= -.13). Females experienced a higher number of interpersonal traumas (b= .14). Youth on public insurance experienced a higher number of non-interpersonal traumas (b= .11).

Table 14. Descriptive Statistics and Correlation Table for Variables in Model 4.
Means and standard deviations are reported for continuous variables. Frequencies are reported for categorical variables. Correlations are reported for all variables. N= 2692.

	M	SD	Frequency	1	2	3	4	5	6	7	8	9	10
1. PTSD	26.02	14.95	-	-									
2. Aggressive Behavior t-score	63.23	10.99	-	**.13***	-								
3. Social Problems t-score	61.37	9.18	-	**.20***	**.63***	-							
4. Interpersonal trauma summary score	3.09	2.32	-	**.23***	**.15***	**.17***	-						
5. Non-interpersonal trauma summary score	.88	.81	-	**.07***	.03	**.06***	**.18***	-					
6. Female	-	-	62%	**.24***	-.03	.02	**.13***	-.01	-				
7. Black	-	-	25%	-.02	-.001	**-.06***	**-.09***	-.03	-.02	-			
8. Hispanic	-	-	33%	-.01	**-.06***	-.02	-.03	.01	-.02	**-.39***	-		
9. "Other" race	-	-	6%	.01	.01	-.01	**.06***	**.04***	.02	**-.14***	**-.18***	-	
10. Public insurance	-	-	60%	-.004	**.07***	.07*	**.16***	**.08***	-.01	**.08***	-.03	-.006	-

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

Figure 8. Model 4- Interpersonal & Non-interpersonal Summary Score Model
(i.e. Individuals who reported either interpersonal or non-interpersonal trauma; n= 2692). Standardized results (i.e. betas) are included. Solid lines represent significant direct pathways; dotted lines represent non-significant pathways.

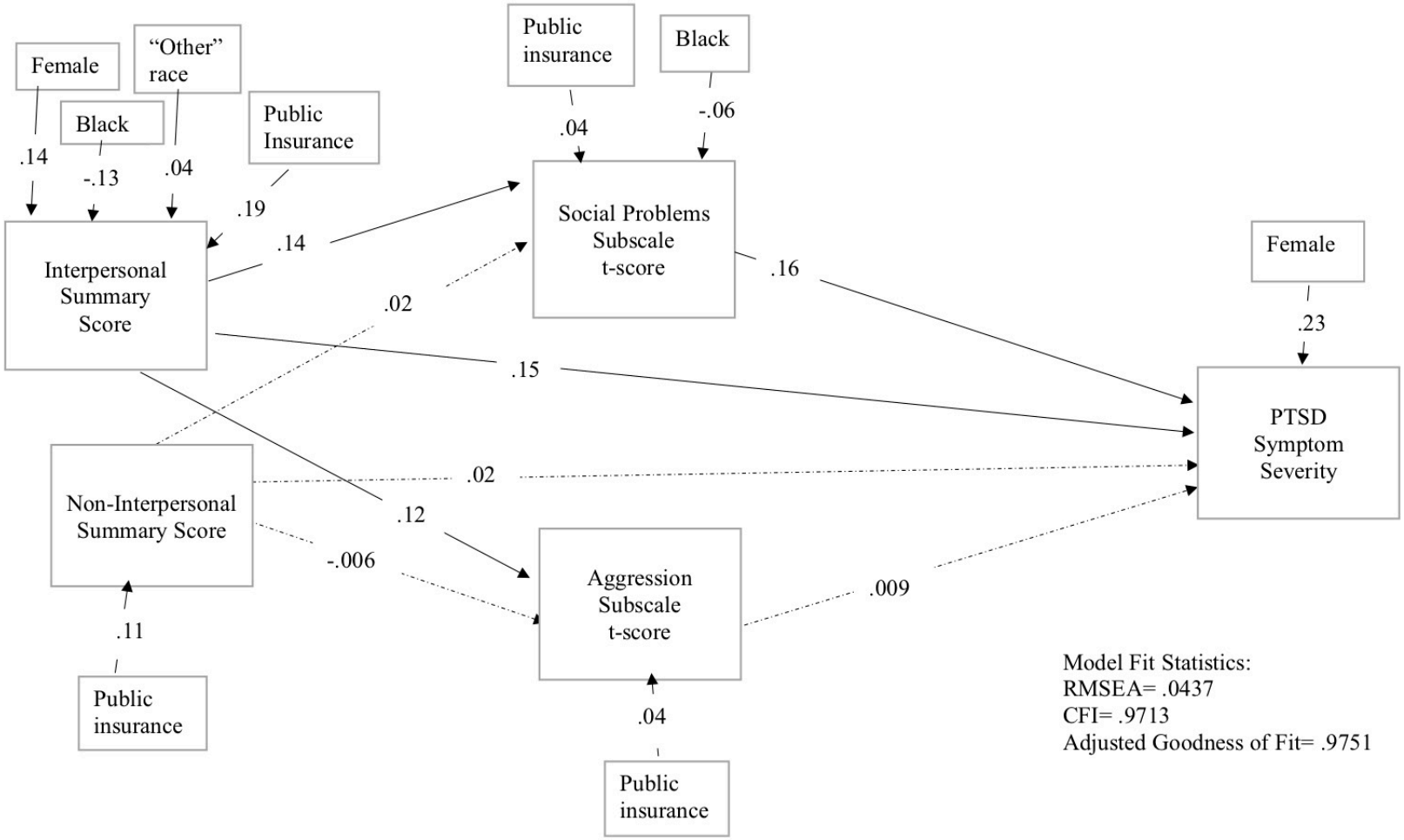


Table 15. Results of the Interpersonal and Non-Interpersonal Summary Score Model

N= 2,692		
Direct effects	b (SE)	Standardized results Estimate (SE)
Social problems→ PTSD	**.26 (.04)****	**.16 (.02)****
Aggression → PTSD	.01 (.03)	.009 (.02)
Interpersonal trauma → PTSD	**.99 (.12)****	**.15 (.02)****
Non-interpersonal trauma → PTSD	.42 (.33)	.02 (.02)
Interpersonal trauma → social problems	**.55 (.08)****	**.14 (.02)****
Non-interpersonal trauma → social problems	.21 (.21)	.02 (.02)
Interpersonal trauma → aggression	**.56 (.09)****	**.12 (.02)****
Non-interpersonal trauma → aggression	-.08 (.25)	-.006 (.02)
Total direct effects of interpersonal trauma on PTSD	**.14 (.12)****	**.15 (.02)****
Total direct effects of non-interpersonal trauma on PTSD	.42 (.33)	.02 (.02)
Control variables		
Female → PTSD	**6.97 (.56)****	**.23 (.02)****
Black → social problems	**-1.35 (.33)****	**-.06 (.02)****
Public insurance → social problems	**.71 (.36)***	**.04 (.02)***
Public insurance → aggression	**.83 (.43)***	**.04 (.02)***
Hispanic → aggression	-.46 (.37)	-. 02 (.02)
Female → Interpersonal trauma	**.66 (.09)****	**.14 (.02)****
Black → Interpersonal trauma	**-.67 (.10)****	**-.13 (.02)****
"Other" race → Interpersonal trauma	**.42 (.19)***	**.04 (.02)***
Public → Interpersonal trauma	**.88 (.09)****	**.19 (.02)****
Public → Non-interpersonal trauma	**.18 (.03)****	**.11 (.02)****
"Other" race → Non-interpersonal trauma	.05 (.07)	.01 (.02)
Indirect effects		
Total indirect effects of interpersonal trauma on PTSD	**.15 (.03)****	**.02 (.004)****
Total indirect effects of non-interpersonal trauma on PTSD	.05 (.06)	.003 (.003)

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

Post-Hoc Analyses and Results

After completing these initial analyses, post-hoc analyses were completed on the interpersonal trauma subset to specifically examine the potential differences by gender. Due to previous research that suggests that females have higher rates of PTSD than males (Pineles, Hall, & Rasmusson, 2017; Walker, Mohr, Stein, & Seedat, 2002), examining these relationships by gender could help identify potential differences as to why females have higher rates of PTSD than males. Model 2, the subset of youth who experienced only interpersonal traumas, was chosen as the model to examine further by gender given the finding of full mediation for social problem behaviors, compared to partial or no mediation for the other models. Therefore, determining if a full mediation relationship existed for both males and females could potentially inform knowledge on why PTSD rates are different by gender, and could inform potential treatment by gender.

Descriptive statistics for females are provided in Table 16. For females, interpersonal trauma was associated with higher social problem behaviors, higher aggressive behaviors, and higher PTSD symptom severity. For females, the average number of interpersonal traumas observed was 2.89 traumas (SD= 1.88). The average aggressive behavior t-score was in the normal range (M=62.65, SD= 10.66). The average social problems t-score was in the normal range (M= 61.04, SD= 9.43). The average PTSD symptom severity score was 28.66 (SD=15.33).

Descriptive statistics for males are provided in Table 16. For males, higher social problem behaviors were associated with higher PTSD symptom severity. For males, the average number of interpersonal traumas observed was 2.75 traumas (SD= 1.79). The average aggressive behavior t-score was in the normal range (M=63.22, SD= 10.89). The average social problems t-

score was in the normal range (M= 60.49, SD= 8.83). The average PTSD symptom severity score was 20.71 (SD=13.89).

Table 16. Descriptive Table for the Female and Male Interpersonal Subset Model
Means and standard deviations are reported for continuous variables. Frequencies are reported for categorical variables.

	Females (n= 581)			Males (n= 345)		
	M	SD	Frequency	M	SD	Frequency
1. PTSD	28.66	15.33	-	20.71	13.89	-
2. Aggressive Behavior t-score	62.65	10.66	-	63.22	10.89	-
3. Social Problems t-score	61.04	9.43	-	60.49	8.83	-
4. Interpersonal trauma summary score	2.89	1.88	-	2.75	1.79	-
5. Black	-	-	24%	-	-	26%
6. Hispanic	-	-	34%	-	-	34%
7. “Other” race	-	-	6%	-	-	6%
8. Public insurance	-	-	54%	-	-	54%

Figure 9 depicts the model for females exposed to only interpersonal traumas. Significant control variables from the interpersonal only model (Model 2) were included in this model to keep the variables consistent between models. The model fit the data well (RMSEA=.0294, CFI= .9933, AGF=.9795). Estimates, standard error, and significance of the paths for direct and indirect effects are listed in Table 17. For females, experiencing a higher number of interpersonal traumas was associated with higher social problem behaviors and higher aggressive behaviors. Higher social problem behaviors were associated with higher PTSD symptom severity. For females, trauma contributed indirectly to PTSD symptom severity through social problem behaviors ($p < .05$; i.e. mediation).

Figure 10 depicts the model for males exposed to only interpersonal traumas. Significant control variables from the interpersonal only model (Model 2) were included in this model to

keep the variables consistent between models. The model fit the data well (RMSEA= .0353, CFI= .9918, AGF=.9670). Estimates, standard error, and significance of the paths for direct and indirect effects are listed in Table 17. For males, there were no significant associations between interpersonal trauma, social problem behaviors, aggressive behaviors, and PTSD symptom severity. Higher social problem behaviors were associated with higher PTSD symptom severity for males ($p < .01$). There were no indirect relationships between interpersonal trauma and PTSD symptom severity for males (i.e. no mediation).

Figure 9. Female Interpersonal Trauma Subset Model
(i.e., only female individuals who reported interpersonal trauma included in the model; n= 581). Standardized results (i.e. betas) are included. Solid lines represent significant direct pathways; dotted lines represent non-significant pathways.

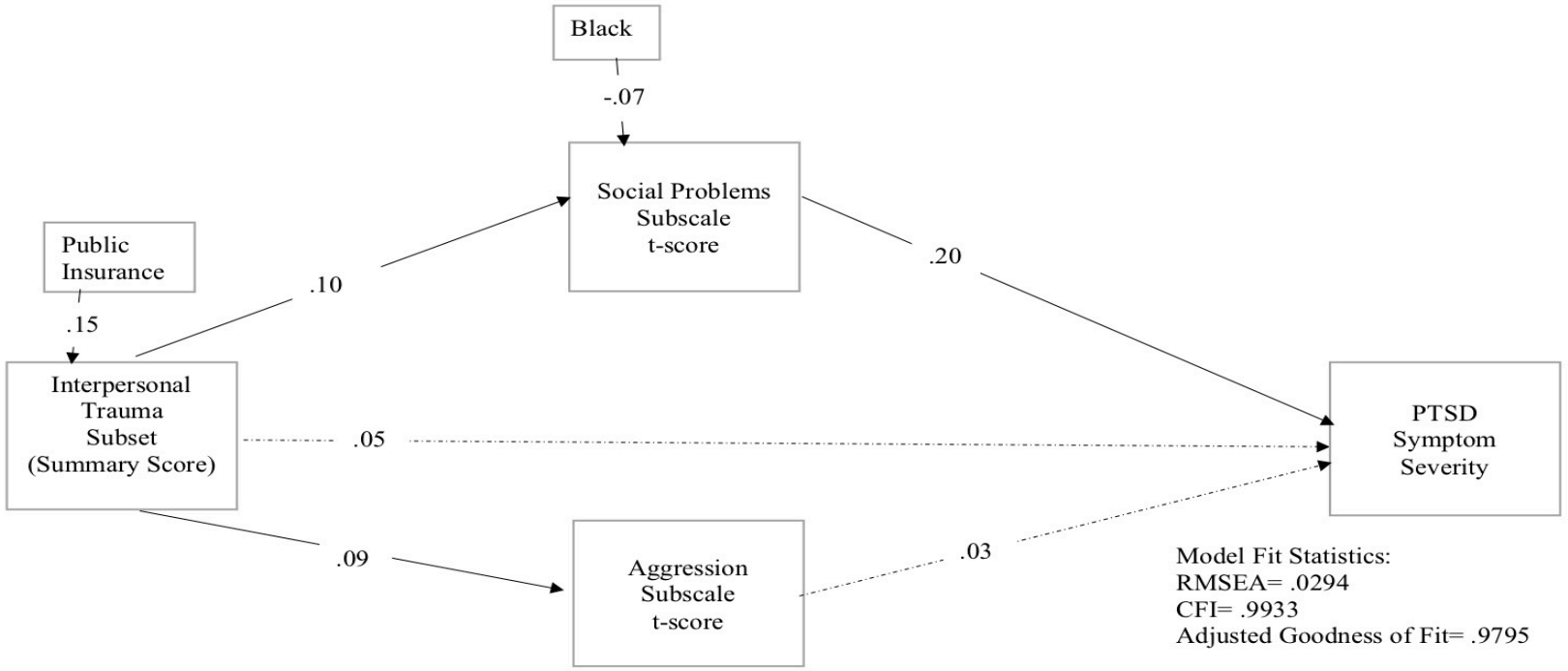


Figure 10. Male Interpersonal Trauma Subset Model
(i.e., only male individuals who reported interpersonal trauma included in the model; n= 345). Standardized results (i.e. betas) are included. Solid lines represent significant direct pathways; dotted lines represent non-significant pathways.

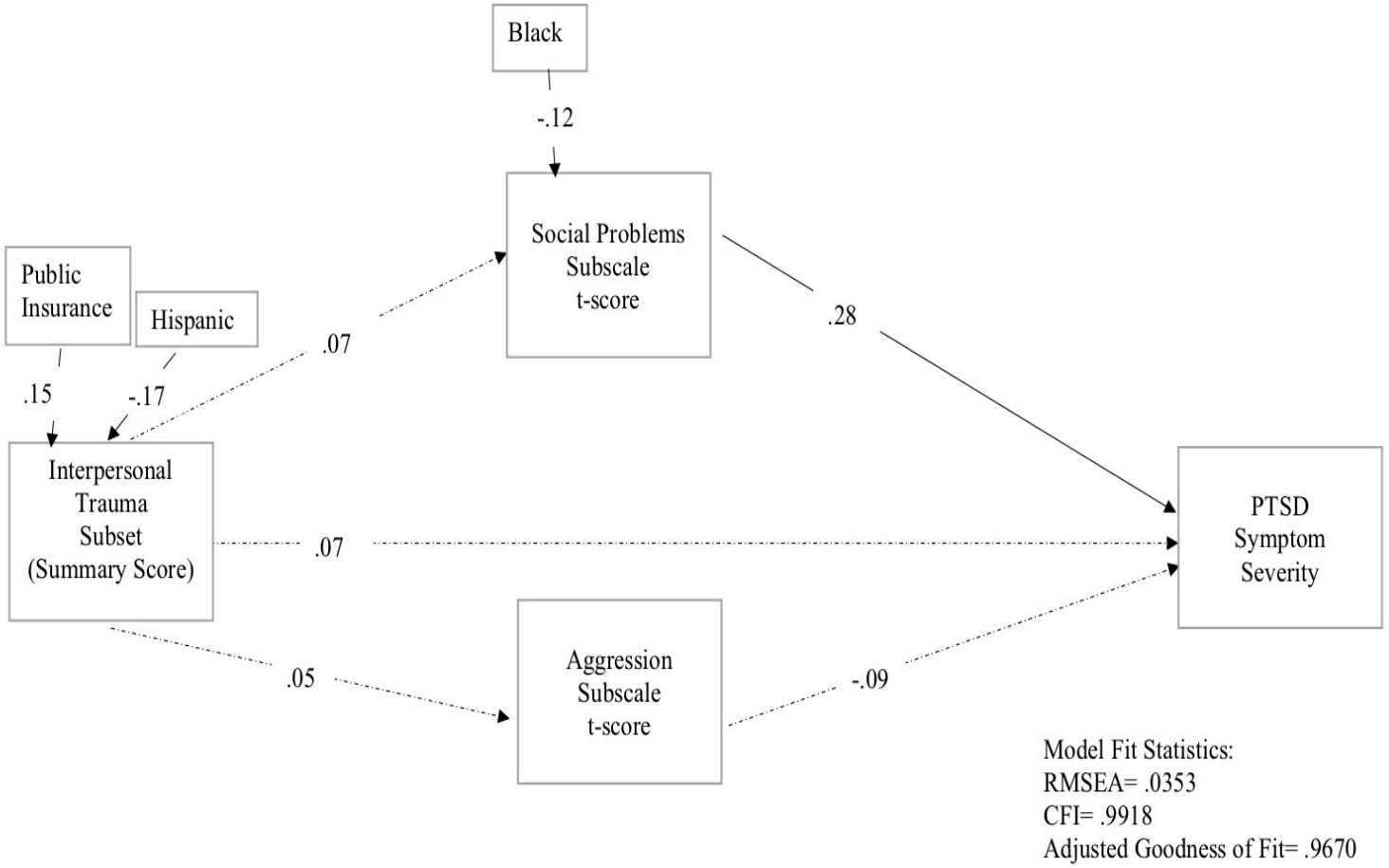


Table 17. Results of the Female and Male Subset Models

Female Interpersonal Trauma only (n = 581) (See Figure 9)			Male Interpersonal Trauma only (n = 345) (See Figure 10)		
Direct effects	b (SE)	Standardized Results Estimate (SE)	**Direct effects**	b (SE)	Standardized Results Estimate (SE)
Social problems → PTSD	**.33 (.09)****	**.20 (.05)****	Social problems → PTSD	**.45 (.11)****	**.28 (.07)****
Aggression → PTSD	.04 (.08)	.03 (.05)	Aggression → PTSD	-.12 (.09)	-.09 (.07)
Interpersonal trauma → PTSD	.41 (.33)	.04 (.03)	Interpersonal trauma → PTSD	.55 (.41)	.07 (.05)
Interpersonal trauma → social problems	**.50 (.21)***	**.10 (.04)***	Interpersonal trauma → social problems	.36 (.27)	.07 (.05)
Interpersonal trauma → aggression	**.50 (.24)***	**.09 (.04)***	Interpersonal trauma → aggression	.30 (.34)	.05 (.06)
Total direct effects on PTSD	.41 (.33)	.05 (.02)	Total direct effects on PTSD	.55 (.41)	.07 (.05)
Control variables			*Control variables*		
Black → social problems	**-1.43 (.71)***	**-.07 (.03)***	Hispanic → interpersonal trauma	**-.64 (.20)****	**-.17 (.05)****
Public insurance → interpersonal trauma	**.58 (.15)****	**.15 (.04) ****	Public insurance → interpersonal trauma	**.71 (.19)****	**.20 (.05)****
			Black → social problems	**-2.4 (.84)****	**-.12 (.04)****
Indirect effects			**Indirect effects**		
Total indirect effects on PTSD	**.18 (.08)***	**.02 (.01)***	Total indirect effects on PTSD	.13 (.10)	.02 (.01)

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

Chapter V

A Scoping Review Identifying Interventions Focused on Interpersonal Problems in Trauma-Exposed Adolescents

Introduction

Childhood trauma, which encompasses a variety of traumatic events that can occur in childhood, including childhood sexual and physical abuse, neglect, and community violence, can cause distress and disrupt a child's physical and psychological development (Felitti et al., 1998; Finkelhor, Turner, Shattuck, & Hamby, 2015; Kalmakis & Chandler, 2014). Childhood trauma is associated with many negative outcomes throughout the lifespan, including worse behavior problems in childhood (Bücker et al., 2012; van der Kolk, 2003), anxiety, depression, suicidality, PTSD, and criminality in adolescence (Dube et al., 2006; Greeson et al., 2014), and heart disease, illicit drug use, and obesity in adulthood (Felitti et al., 1998). Given all these negative outcomes, intervening with youth who experienced trauma is imperative.

Childhood trauma is associated with interpersonal problems (Burack et al., 2006; Elliott, Cunningham, Linder, Colangelo, & Gross, 2005; Kim & Cicchetti, 2004; Perlman, Kalish, & Pollak, 2008; DePrince, Chu, & Combs, 2008), and may be an important avenue for interventions for youth who have experienced trauma. Interpersonal problems are defined as problematic interpersonal relationships and difficulties relating to others, including with peers and family, that create a negative impact on one's ability to form healthy and rewarding

relationships (Hoermann, Zupanick, & Dombeck, 2013; Horowitz, Rosenberg, & Bartholomew,1993).Adolescents who exhibit interpersonal problems are at risk for the development of mental health problems, including higher levels of stress (Segrin, 2001; Shahar, Joiner, Zuroff, & Blatt, 2004), generalized anxiety disorder (Borkovec, Newman, Pincus, & Lytle, 2002; Eng & Heimberg, 2006), depression (Petty, Sachs-Ericsson, & Joiner, 2004; Vittengl, Clark, & Jarrett, 2003), and PTSD (Bolton et al., 2004; McLean, Rosenbach, Capaldi, & Foa, 2013). Identifying gaps in interventions that address interpersonal problems could therefore help improve treatments for adolescents who experienced trauma. This scoping review summarizes research on existing childhood trauma interventions that contain content addressing interpersonal problems, and identifies gaps in content, efficacy, and generalizability of interventions that, at least in part, focus on improving interpersonal problems in youth who have experienced trauma.

Methods

The goal of this scoping review was to identify interventions for trauma-exposed adolescents that include content on interpersonal problems, and of those interventions to summarize the intervention content and efficacy, and identify gaps in intervention generalizability. Specifically, this review focuses on intervention content by examining session activities, efficacy by examining outcomes, and gaps in generalizability by examining intervention location, type of trauma exposure, and facilitators. The research questions "What interventions are there for trauma-exposed adolescents that focus on interpersonal problems? What content do the interventions include? What are differences in content based on trauma type?, and What are gaps in the interventions?" shaped this review. The framework by Arksey & O'Malley (2007) guided this review: 1. Identify the research question, 2. Identify relevant

studies, 3. Study selection, 4. Charting the data, 5. Collating, summarizing, and reporting results, 6. Consultation. After the research question was developed, key word searches were conducted in scholarly databases including psycINFO, PubMed, and CINAHL. Keywords were used in each database search to capture a variety of interventions (see Appendix E for a list of the keywords used in each search). The search was limited to articles published between 1998 and 2018. The year 1998 was chosen as the starting year because that is the year that the original Adverse Childhood Experiences Study linked childhood trauma to poor physical and psychological outcomes in adulthood (Felitti et al., 1998). The author also worked with a health sciences librarian to improve search results and determine the best key words to use.

Titles and abstracts of articles retrieved via the key word search were reviewed for inclusion and exclusion criteria. Once titles and abstracts were screened, full-text reviews were conducted to determine what full-text articles met the inclusion criteria. The following inclusion criteria was used for the title, abstract, and full-text reviews: 1) article written in English, 2) consist of an adolescent sample (12-18-year-old youth), 3) be some sort of intervention study (e.g. RCT, pilot), and 4) the intervention had to target interpersonal problems in some form (e.g. social skills, interpersonal relationships). After articles were reviewed for inclusion criteria, the exclusion criterion was applied to get rid of any other articles that were not applicable. Articles were excluded if they did not report results of the intervention (i.e. just provided intervention protocol). After an article was determined that it fit the inclusion and exclusion criteria, the following information was collected and added to a table: Author/ Title, Sample, Intervention, Interpersonal Problems Content, Interpersonal Problems Measure, Location, and Results. Two other strategies were used to ensure inclusion of all possible interventions. First, the National Child Traumatic Stress Network website was reviewed, since the website lists evidence-based

trauma interventions (National Child Traumatic Stress Network, n/d). Second, the results were reviewed by key informants with knowledge in childhood trauma interventions. These additional screenings were done as a way to verify that all possible interventions were identified.

Results

Figure 11 depicts a diagram reviewing the number of articles included at each stage in the review process. A total of 1,377 articles were identified through the initial review in the databases. Thirty-nine of those articles were duplicates and were thus deleted. After reviewing titles and abstracts, eighty-five articles were included. This was narrowed down to thirteen articles after reviewing the full-text. Articles were excluded because the sample of youth did not have trauma histories or trauma history was not measured, the article was not an intervention, the article only provided study protocol, the intervention did not intervene on interpersonal problems in some way, or the article did not include adolescents. One additional intervention was identified by discussion with a key informant. Table 18 summarizes the interventions included in this review.

Content.

All the thirteen interventions included content that addressed interpersonal problems, but the content varied from intervention to intervention. Additionally, many of the interventions combined multiple activities relating to interpersonal problems. Seven of the interventions included sessions on communication styles and healthy relationships (Auslander et al., 2017; Danielson et al., 2012; DeVilliers & van den Berg, 2012; Donovan et al., 2015; Ford, Steinberg, Hawke, Levine, & Zhang, 2012; Gudino et al., 2015; Rizzo et al., 2018). For instance, Auslander and colleagues (2017) in their Girls Aspiring Toward Independence intervention included sessions where the participants went through scenarios to practice healthy communication styles

and relationships. In their Risk Reduction intervention, Danielson and colleagues (2012) included a session on family communication to practice communicating needs with family and reducing family conflict. The Skills Training in Affective and Interpersonal Regulation for Adolescents (STAIR-A) by Gudino and colleagues (2015) included teaching on learning to communicate needs and using role-playing activities to master skills in hypothetical situations.

Eight of the interventions included content on positive social support (Carter et al., 2003; D'Andrea et al., 2013; Gudino et al., 2015; Habib, Labruna, & Newman, 2013; Powell & Bui, 2016; Rivard, Bloom, McCorkle, & Abramovitz, 2005; Rizzo et al., 2018). In a sports base themed intervention, D'Andrea and colleagues (2013) included content on supporting one another. In the Structured Psychotherapy for Adolescents Responding to Chronic Stress (SPARCS) intervention, Habib, Labruna, and Newman (2013) focus on strengthening social support and connecting with others to address alienation. In the Sanctuary Model intervention, one session focuses on the importance of social safety and the importance of trusting other people and feeling safe (Rivard et al., 2005).

There was some other content relating to interpersonal problems in some of the interventions. Rivard and colleagues (2005) included a session on boundaries, where youth are taught the difference between emotional and physical boundaries, how to set their own boundaries, and how to recognize others' boundaries. Donovan and colleagues (2015) included a session on listening skills and how one has to be an effective listener in order to be an effective communicator. Finally, DeVilliers and van der Berg (2012) included content regarding tolerance with regards to diversity. In this session, they focused on reciprocal acceptance and tolerance of differences. It is also important to point out that all of these interventions included activities relating to other skills, such as setting future goals or regulating emotions.

Trauma exposure.

A variety of interpersonal trauma types were addressed in the interventions. Interpersonal traumas youth were exposed to included child maltreatment (Auslander et al., 2017), domestic violence (Carter et al., 2003), complex trauma (D'Andrea et al., 2013), childhood sexual abuse (Danielson et al., 2012), violence (DeVilliers & van der Berg, 2012), historical trauma (Donovan et al., 2015), chronic trauma (Gudino et al., 2015), and interpersonal trauma (Habib, Labruna, & Newman, 2013), abuse, neglect, or violence exposure (Rivard et al., 2005), and dating violence (Rizzo et al., 2018). One study did not specify what types of trauma youth were exposed to, as the inclusion criteria only stated that the youth had a history of childhood trauma (Muela et al., 2017). One study included youth exposed to interpersonal and non-interpersonal traumas (Ford et al., 2012). However, only one intervention included youth who were specifically exposed to a non-interpersonal trauma. Powell and Bui's (2016) intervention included youth exposed to a tornado in Oklahoma. Although their inclusion criteria were youth exposed to the tornado, they did not measure potential interpersonal traumas youth were exposed to, so this sample still could have had interpersonal trauma exposure.

Efficacy.

There were only five randomized controlled trials included (Ford et al., 2012; Danielson et al., 2012; Rizzo et al., 2018; Auslander et al., 2017; DeVilliers & van der berg, 2012). This limits the ability to determine the efficacy of the interventions, and the ability to determine what intervention content is the most effective at improving outcomes. Since the studies that were not randomized did not have strong internal validity, even if the results of the study showed improvements in outcomes, it is difficult to determine if the improvement was due to the intervention itself or due to some other cause (e.g. outside treatment, forming a relationship).

Overall, eight studies showed improvements in interpersonal problems in some way (D'Andrea et al., 2013; Danielson et al., 2012; Gudino et al., 2015; Habib, Labruna, & Newman, 2013; Muela, Balluerka, Amiano, Caldenty, & Alira, 2017; Powell & Bui, 2016; Rivard et al., 2015). For instance, Muela and colleagues (2017) found an improvement in the participant's ability to interact with peers and family from their Animal Assisted Therapy Intervention. None of these studies that showed an improvement in interpersonal problems had an active control group, however half of these studies had a waitlist control group. So although the waitlist control group provides a comparison group that improves internal consistency, it's not as strong as an active control group. It is also important to note that Ford, Steinberg, Hawke, Levine, & Zhang (2012) found improvements in post-traumatic cognitions as a whole in their Enhanced Treatment as Usual intervention compared to Trauma Affect Regulation: Guide for Education and Therapy, and although this was not a measure of interpersonal problems, certain items relate to interpersonal problems (e.g. I feel isolated and set apart from others; people can't be trusted).

Aside from interpersonal problems, studies also commonly examined mental health outcomes (e.g. anxiety, depression). Interestingly, of the randomized controlled trials, similar effect size changes were found between the intervention and control groups. The control groups in the studies were a treatment as usual group or knowledge only group. One study examined a different intervention that the authors compared to a relational support treatment intervention (Ford et al., 2017). This indicates that the interventions were not necessarily better than other treatments the youth were receiving.

Setting & facilitators.

Interventions were delivered in a variety of locations. Five interventions were implemented in the school setting (DeVilliers & van der Berg, 2012; Donovan et al., 2015;

Gudino et al., 2015; Powell & Bui, 2016; Rizzo et al., 2018). Four interventions took place in a residential treatment center (D'Andrea et al., 2013; Habib, Labruna, & Newman, 2013; Muela et al., 2017; Rivard et al., 2005). Other interventions took place in outpatient clinics and community mental health agencies (Auslander et al., 2017; Carter et al., 2003; Danielson et al., 2012; Ford et al., 2012). All but one intervention was performed by psychologists, social workers, or graduate students in these fields. The Do the Good sports-based intervention (D'Andrea et al., 2013) trained coaches who did not have prior mental health training.

Discussion

Although a variety of interventions were effective and showed improvements in interpersonal problems, many of the interventions that were effective included activities or role-playing games on practicing interactions (Donovan et al., 2015; Gudino et al., 2015; Habib, Labruna, & Newman, 2013; Powell & Bui, 2016). An exception is the intervention Carter and colleagues (2003) created. Carter and colleagues (2003) taught children conflict resolution skills and parent-child relationship skills, but did not have children practice these skills; they did not find an improvement in social skills following treatment. This suggests that interventions that do not include time to practice the skills may not be as effective. Therefore, role-playing activities and practicing the skills may be more beneficial than solely teaching adolescents the skills. It is important to note that two of the interventions did not measure interpersonal problems, Holding up Our Youth (Donovan et al., 205) and Project Date SMART (Rizzo et al., 2018), so it is difficult to determine if the intervention content was effective. Additionally, while a majority of the studies found an improvement in outcomes, it is difficult to compare effects across interventions given that each study used a different measure of interpersonal problems.

Interestingly, all of the interventions included content not relating to interpersonal problems. For instance, in the Enhanced Treatment as Usual Intervention by Ford and colleagues (2012), besides healthy relationships content, activities also included focusing on strengths, managing stressors, and achieving personal goals. For the Sanctuary Model intervention, content also included planning for one's future, identifying feelings, and managing trauma responses (Rivard et al., 2005). Given the many negative post-trauma symptoms youth can experience following a traumatic event (Ford, 2017), these interventions that combine multiple skills could benefit youth the most by allowing them to learn a variety of skills.

The interventions identified in this review had samples of youth exposed to a range of trauma types. Few studies focused on youth exposed to non-interpersonal traumas. The Journey of Hope intervention, which included youth exposed to a tornado in Oklahoma, was the only intervention that specifically just included youth exposed to a non-interpersonal trauma (Powell & Bui, 2016). Interestingly, Powell and Bui focused on identifying social support networks, rather than learning communication skills or healthy boundaries. Given that interpersonal traumas can disrupt one's sense of justice, autonomy, beneficence, and dignity (Charuvastra & Cloitre, 2008; Ford, 2017; Punamaki et al., 2005), compared to non-interpersonal traumas, it makes sense that exposure to different trauma types would influence what interpersonal problems content to include. Therefore, interventions may differ based on the trauma type youth experienced. Youth who experienced a non-interpersonal trauma may benefit from interventions focused on building support. Youth who experienced an interpersonal trauma may benefit from interventions that teach and practice interpersonal skills.

The remaining twelve interventions included youth exposed to a variety of trauma types (D'Andrea et al., 2013; Ford et al., 2012; Gudino et al., 2015; Muela et al., 2017), at least one

interpersonal trauma (Habib, Labruna, & Newman, 2012), historical trauma (Donovan et al., 2015), dating violence (Rizzo et al., 2018), or traumas that fall under the broad categories of abuse and neglect (Auslander et al., 2017; Carter et al., 2003; Danielson et al., 2012; De Villiers & van den Berg, 2012; Rivard et al., 2005). While the range of trauma types the interventions addressed is far-reaching and inclusive of potential traumatic events, there was a gap in interventions that reported the average trauma score participants had. There is a dose-response relationship between the number of types of trauma one experiences and negative outcomes, meaning the more trauma types one has experienced, the more negative outcomes they are likely to experience (Centers for Disease Control and Prevention, 2010; Felitti et al., 1998). Better understanding the range of traumatic events participants had experienced could shed light on the interventions that were the most beneficial for participants. For instance, if an intervention was effective in a sample of youth exposed to abuse, neglect, and community violence, compared to an intervention that was effective in a sample of youth exposed to abuse, the content in the first intervention may be more beneficial to improve outcomes; however, since not all of the interventions examined all previous trauma exposure, instead of focusing on exposure to a specific trauma type, it is difficult to compare results in this way.

A strength of the interventions was that a variety of settings were used that could improve access to care, including school and outpatient settings, but there were still gaps in settings that were used, specifically in inpatient and juvenile justice settings. While interventions in inpatient settings may be more difficult to implement due to time constraints, implementing an intervention in the in-patient setting could benefit trauma-exposed youth suffering acutely. Up to 96% of psychiatric inpatients have a trauma history (Gudino et al., 2014), so it is imperative to implement trauma interventions in the inpatient setting. Teaching and practicing effective

communication skills and healthy boundaries in a group therapy format in the inpatient setting could be beneficial. Another gap in settings was interventions that took place in juvenile justice settings. Although Ford, Steinberg, Hawke, Levine, & Zhang's (2012) Enhanced Treatment as Usual intervention included delinquent girls, no other intervention included youth in the juvenile justice system. Up to 90% of youth involved in the juvenile justice system have experienced trauma (Abram et al., 2004; Ford, Hartman, Hawke, & Chapman, 2008), so implementing more interventions in this setting could help more adolescents.

Psychologists and social workers facilitated most of the interventions. Significantly absent as facilitators were nurses. Considering that nurses are the largest healthcare occupation in the United States (Bureau of Labor Statistics, 2015), it is a limitation that none of the interventions utilized nurses. Additionally, nurses can practice in a variety of settings, such as in schools, hospitals, and community clinics. Therefore, utilizing nurses more often could also improve the availability of interventions in different settings.

There were some limitations to this review. First, there was only one reviewer, so results may be biased. A more systematic approach may have occurred with more than one reviewer. Second, intervention effects cannot be compared across studies since a meta-analysis was not conducted and the authors did not use the same measures. However, given these limitations, there are strengths to this study. A health sciences librarian was consulted to improve search term accuracy. Results were reviewed with a content expert and compared to an evidence-based list of trauma interventions to verify that all possible interventions were identified.

Conclusion

There are a variety of interventions for adolescents who experienced trauma that target interpersonal problems. Given the importance of interpersonal problems in relation to other

mental health problems (e.g. depression, stress, anxiety, PTSD), utilizing these interventions more often could be beneficial for trauma-exposed youth. The results support that there are existing interventions that improve interpersonal problems in adolescents exposed to trauma. However, there are gaps for these interventions, including the trauma types addressed, settings used, and facilitators. Future interventions may benefit from addressing these gaps to improve access to treatment for trauma-exposed youth.

Figure 11. Article Results

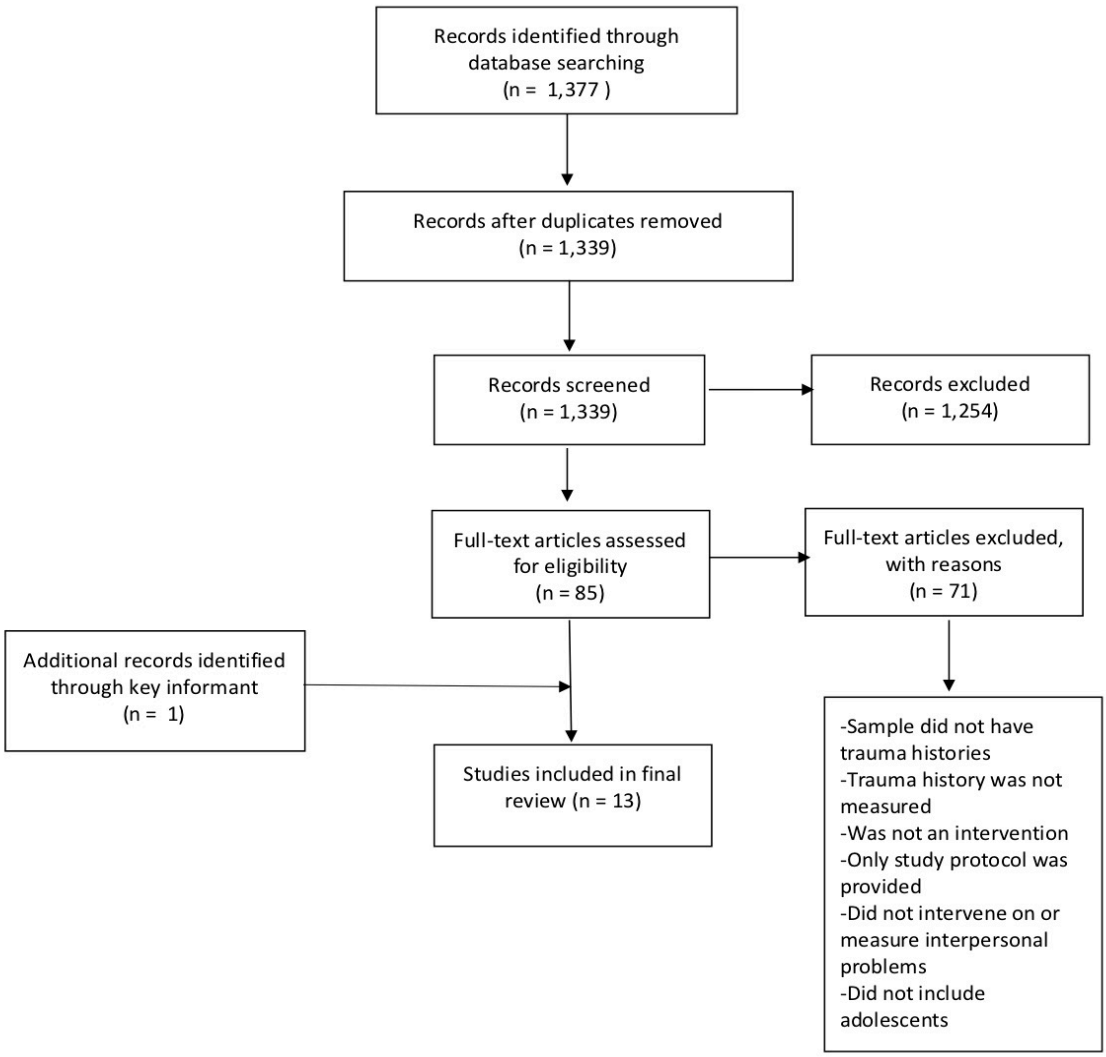


Table 18. Interventions

Author/ Title	Sample	Intervention	Interpersonal Problems Content	Interpersonal Problems Measure	Location	Results
Auslander et al., 2017: Adaptation and implementation of a trauma-focused cognitive behavioral intervention for girls in child welfare	Girls 12-18 years old in the child welfare system with a history of maltreatment	Girls Aspiring toward Independence (GAIN)	Focus on group support; address communication styles and healthy relationships; discuss social problem-solving	Social Problem-Solving Inventory-Revised: Short Form (measures the cognitive behavioral processes used by individuals to adapt, cope, and resolve everyday problems; D'Zurilla et al., 2002)	Community- based mental health agency	Modest increase in social-problem solving skills
Carter et al., 2003: Treating Children Exposed to Domestic Violence	Children 4-18 years old exposed to domestic violence	Group therapy focused on building safety planning skills, self-esteem, developmentally appropriate ways of expressing feelings, prosocial skills, conflict resolution skills, parent-child	Developing pro-social skills, conflict resolution skills and to identify and strengthen support systems	Social Skills Rating System (SSRS; Gresham & Elliott, 1990- assesses behaviors relating to social competence)	Licensed therapists ran the intervention in state-run agencies	No significant changes in social skills following treatment

		relationship skills, and to identify and strengthen support system				
D'Andrea et al., 2013: Play to the Whistle: A Pilot Investigation of a Sports-Based Intervention for Traumatized Girls in Residential Treatment	Adolescents aged 12-21 in a residential treatment center who had complex trauma histories	Do the Good- a sports-based intervention	Developing leadership skills, responsibility-taking, providing support for one another, and framing things in terms of successes	Did examine player behaviors (i.e. engaged in conflict; resolved conflict; helped other players; communicated with teammates) Also measured overall CBCL score	Coaches were trained in the course, but did not have previous mental health training. Intervention took place in residential treatment center.	Improvement in total CBCL symptoms; Improvement in how much one helped other players; slight improvement in encouraged teammates
Danielson et al., 2012- Reducing Substance Use Risk and Mental Health Problems Among Sexually Assaulted Adolescents: A Pilot Randomized Controlled Trial	CSA victims seeking treatment (13-17 years old) with caregivers.	Risk Reduction through Family Therapy	Has a session focused on Family Communication	Cohesion and Conflict subscales of the Family Environment Scale (FES; Moos & Moos, 1994)	Therapy was delivered in an outpatient clinic by clinical psychology graduate students	Improvement in cohesion and decrease in conflict with family

De Villiers & van den Berg., 2012: The implementation and evaluation of a resiliency programme for children	11-12-year-old adolescents from South Africa exposed to violence and poverty	Resilience program focused on interpersonal competencies and interpersonal skills	basic communication skills, conflict management and assertiveness; tolerance with regard to diversity	Measured interpersonal skills by assessing interpersonal strength, family involvement, sense of relatedness, family appraisal and general social support	School	Not significant increase in interpersonal skills
Donovan et al., 2015: Healing of the canoe: Preliminary results of a culturally grounded intervention to prevent substance abuse and promote tribal identity for Native youth in two Pacific northwest tribes	Native youth in a Pacific Northwest Tribe in High School-exposed to historical trauma	Holding Up Our Youth-to prevent substance use and teach tools for youth to navigate through life's journey	Teach listening skills and effective communication skills (i.e. how to disagree respectfully, refusal and assertiveness skills, practice positive ways to resolve conflict	Did not measure interpersonal skills	School	N/A

Ford, Steinberg, Hawke, Levine, & Zhang (2012): Randomized Trial Comparison of Emotion Regulation and Relational Psychotherapies for PTSD with Girls Involved in Delinquency	Adolescent girls ages 13-17 involved in delinquency with trauma histories	Enhanced Treatment as Usual (ETAU) - A manualized relational therapy used for a control group	Provides client-centered therapy on strengths, focusing on solutions, how to manage stressors, achieve personal goals, and develop healthy relationships	No specific interpersonal problems measure, although did use the Post-traumatic cognitions inventory (Foa et al., 1999), which has some items related to interpersonal problems (e.g. I feel isolated and set apart from others; people can't be trusted)	Therapists with doctoral degrees or master's degrees performed the therapy.	Small effect size gains on PTCI
Gudino et al., 2015: STAIR-A for girls: A pilot study of a skills-based group for traumatized youth in an Urban school setting	Girls 11-16 years old in Manhattan of ethnic/ racial minorities exposed to chronic trauma	Skills Training in Affective and Interpersonal Regulation for Adolescents (STAIR-A)	Build interpersonal skills and social resources that support functioning and protect against stress (girls learned skills to identify and communicate their needs to others in ways that	Interpersonal Relations subscale of the Behavior Assessment System for Children, Self-Report of Personality (Reynolds & Kamphaus, 1992); Also used	School	Significant improvement in social stress; slight improvement ($p < .10$) in interpersonal relations

			would be more likely to be effective. Subsequent sessions focused on using role-playing activities to master effective interpersonal skills in a wide range of hypothetical situations (e.g., saying no or making requests of others)	the social stress subscale to assess stress in personal relationships		
Habib, Labruna, & Newman, 2013: Complex Histories and Complex Implementation of a Manually-Guided Group Treatment for Traumatized Adolescents	Adolescents aged 14-21 years old with history of at least one interpersonal trauma in residential treatment	SPARCS: Structured Psychotherapy for Adolescents Responding to Chronic Stress	Has a component on connecting with others to address problems of alienation, trust, and social support and learning skills to manage interpersonal interactions	Youth Outcome Questionnaire- Self Report (Wells et al., 1999) has an interpersonal relations and social problems subscale	Treatment occurred in residential treatment centers and was performed by psychologists or social workers	Significant improvement in interpersonal relationships ($p<.01$), almost significant improvement in social problems (.06)

Muela et al., 2017: Animal-assisted psychotherapy for young people with behavioural problems in residential care	12 to 17-year-old adolescents in residential care exposed to trauma with mental health problems	Animal Assisted Therapy	Included content on interpersonal relationships	No direct scale used to measure interpersonal problems, but did measure ability to interact satisfactorily with peers and adults	Residential Treatment Center	Improvement in social skills by ability to interact with peers and adults
Powell & Bui, 2016: Supporting social and emotional skills after a disaster: Findings from a mixed methods study	Middle school adolescents exposed to a tornado in Oklahoma	Journey of Hope	Content included on identifying social support networks and cooperative games	No direct scale to measure interpersonal problems, but did use qualitative data to examine peer relationships	School	Participants experienced enhanced peer support (e.g. talking to persons they had never talked to before, making new friends, and comfort sharing within the group)
Rivard et al., 2005: Preliminary results of a study examining the implementation and effects of a trauma recovery framework for youths in	Youth in residential treatment (12-20 years old) with histories of abuse, neglect, or violence exposure	The Sanctuary Model	Content on boundaries and supporting others	Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987); Social Problem Solving Questionnaire (Sewell, Paikoff, &	Residential unit	Verbal aggression subscale of the Social Problem Solving Questionnaire decreased slightly over time.

residential treatment				McKay, 1996)		
Rizzo et al., 2018: Project date smart: A dating violence (dv) and sexual risk prevention program for adolescent girls with prior dv exposure	Youth (ages 14-17) with prior exposure to dating violence	Project Date SMART	Content on healthy vs. unhealthy relationships, evaluating relationships/ partner, communication skills, social support, and relationship values	No interpersonal problem measure	School	N/A

References

Abram, K. M., Teplin, L. A., Charles, D. R., Longworth, S. L., McClelland, G. M., & Dulcan, M. K. (2004). Posttraumatic stress disorder and trauma in youth in juvenile detention. *Archives of General Psychiatry*, 61, 403–410.

Arksey, K., & O'Malley, L. (2007). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32.

Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, *16*(5), 427-454.

Auslander, W., McGinnis, H., Tlapek, S., Smith, P., Foster, A., Edmond, T., & Dunn, J. (2017). Adaptation and implementation of a trauma-focused cognitive behavioral intervention for girls in child welfare. *American Journal of Orthopsychiatry*, *87*(3), 206.

Bücker, J., Kapczinski, F., Post, R., Ceresér, K. M., Szobot, C., Yatham, L. N., ... & Kauer-Sant'Anna, M. (2012). Cognitive impairment in school-aged children with early trauma. *Comprehensive Psychiatry*, *53*(6), 758-764.

Bolton, D., Hill, J., O'ryan, D., Udwin, O., Boyle, S., & Yule, W. (2004). Long-term effects of psychological trauma on psychosocial functioning. *Journal of Child Psychology and Psychiatry*, *45*(5), 1007-1014.

Borkovec, T. D., Newman, M. G., Pincus, A. L., & Lytle, R. (2002). A component analysis of cognitive-behavioral therapy for generalized anxiety disorder and the role of interpersonal problems. *Journal of Consulting and Clinical Psychology*, *70*(2), 288.

Burack, J. A., Flanagan, T., Peled, T., Sutton, H. M., Zygmuntowicz, C., & Manly, J. T. (2006). Social perspective-taking skills in maltreated children and adolescents. *Developmental Psychology*, *42*(2), 207.

Bureau of Labor Statistics (2015). U.S. Department of Labor, *The Economics Daily*, Registered nurses have highest employment in healthcare occupations; anesthesiologists earn the most. Retrieved from: https://www.bls.gov/opub/ted/2015/registered-nurses-have-highest-employment-in-healthcare-occupations-anesthesiologists-earn-the-most.htm

Carter, L., Kay, S. J., George, J. L., & King, P. (2003). Treating children exposed to domestic violence. *Journal of Emotional Abuse*, *3*(3-4), 183-202.

Centers for Disease Control and Prevention (2010). Adverse childhood experiences reported by adults- Five states, 2009. *MMWR Morbidity Mortality Weekly Report,* 59, 1609-1613.

Charuvastra, A., & Cloitre, M. (2008). Social bonds and posttraumatic stress disorder. *Annu. Rev. Psychol.*, *59*, 301-328.

D'Andrea, W., Bergholz, L., Fortunato, A., & Spinazzola, J. (2013). Play to the whistle: A pilot investigation of a sports-based intervention for traumatized girls in residential treatment. *Journal of Family Violence*, *28*(7), 739-749.

Danielson, C. K., McCart, M. R., Walsh, K., de Arellano, M. A., White, D., & Resnick, H. S. (2012). Reducing substance use risk and mental health problems among sexually assaulted adolescents: A pilot randomized controlled trial. *Journal of Family Psychology*, *26*(4), 628.

DePrince, A. P., Chu, A. T., & Combs, M. D. (2008). Trauma-related predictors of deontic reasoning: A pilot study in a community sample of children. *Child Abuse & Neglect*, 32, 732–737.

De Villiers, M., & Van den Berg, H. (2012). The implementation and evaluation of a resiliency programme for children. *South African Journal of Psychology*, *42*(1), 93-102.

Donovan, D. M., Thomas, L. R., Sigo, R. L. W., Price, L., Lonczak, H., Lawrence, N., ... & Purser, A. (2015). Healing of the canoe: preliminary results of a culturally grounded intervention to prevent substance abuse and promote tribal identity for native youth in two Pacific northwest tribe. *American Indian and Alaska Native Mental Health Research (Online)*, *22*(1), 42.

Dube, S. R., Miller, J. W., Brown, D. W., Giles, W. H., Felitti, V. J., Dong, M., & Anda, R. F. (2006). Adverse childhood experiences and the association with ever using alcohol and initiating alcohol use during adolescence. *Journal of Adolescent Health*, *38*(4), 444-e1.

D'Zurilla T. J., Nezu A. M., Maydeu-Olivares, A. (2002). A Social Problem-Solving Inventory-Revised: Technical Manual. North Tonawanda, NY: Multi-Health Systems.

Elliott, G. C., Cunningham, S. M., Linder, M., Colangelo, M., & Gross, M. (2005). Child physical abuse and self-perceived social isolation among adolescents. *Journal of Interpersonal Violence*, *20*(12), 1663-1684.

Eng, W., & Heimberg, R. G. (2006). Interpersonal correlates of generalized anxiety disorder: Self versus other perception. *Journal of Anxiety Disorders*, *20*(3), 380-387.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many

of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, *14*(4), 245-258.

Finkelhor, D., Turner, H. A., Shattuck, A., & Hamby, S. L. (2015). Prevalence of childhood exposure to violence, crime, and abuse: Results from the national survey of children's exposure to violence. *JAMA Pediatrics*, *169*(8), 746-754.

Foa, E. B., Ehlers, A., Clark, D. M., Tolin, D. F., & Orsillo, S. M. (1999). The posttraumatic cognitions inventory (PTCI): Development and validation. *Psychological Assessment*, *11*(3), 303.

Ford, J. D., Hartman, J. K., Hawke, J., & Chapman, J. (2008). Traumatic victimization, posttraumatic stress disorder, suicidal ideation, and substance abuse risk among juvenile justice-involved youths. *Journal of Child and Adolescent Trauma*, 1, 75–92.

Ford, J. D., Steinberg, K. L., Hawke, J., Levine, J., & Zhang, W. (2012). Randomized trial comparison of emotion regulation and relational psychotherapies for PTSD with girls involved in delinquency. *Journal of Clinical Child & Adolescent Psychology*, *41*(1), 27-37.

Ford, J. (2017). Complex trauma and complex posttraumatic stress disorder in *APA handbook of trauma psychology: Foundations in Knowledge, Vol. 1*. Chapter 15.

Greeson, J. K., Briggs, E. C., Layne, C. M., Belcher, H. M., Ostrowski, S. A., Kim, S., ... & Fairbank, J. A. (2014). Traumatic childhood experiences in the 21st century: broadening and building on the ACE studies with data from the National Child Traumatic Stress Network. *Journal of Interpersonal Violence*, *29*(3), 536-556.

Gresham, F. M., & Elliott, S. N. (1990). *Social skills rating system: Manual*. American Guidance Service.

Gudiño, O. G., Weis, J. R., Havens, J. F., Biggs, E. A., Diamond, U. N., Marr, M., ... & Cloitre, M. (2015). Group Trauma-Informed Treatment for Adolescent Psychiatric Inpatients: A Preliminary Uncontrolled Trial. *Journal of Traumatic Stress*, *27*(4), 496-500.

Gudiño, O. G., Leonard, S., & Cloitre, M. (2016). STAIR-A for girls: a pilot study of a skills-based group for traumatized youth in an urban school setting. *Journal of Child & Adolescent Trauma*, *9*(1), 67-79.

Habib, M., Labruna, V., & Newman, J. (2013). Complex histories and complex presentations: Implementation of a manually-guided group treatment for traumatized adolescents. *Journal of Family Violence*, *28*(7), 717-728.

Hoermann, S., Zupanick, C., & Dombeck, M. (2013). The most significant, defining featured of personality disorders: Interpersonal difficulties. From: https://www.mentalhelp.net/articles/the-most-significant-defining-featured-of-personality-disorders-interpersonal-difficulties/

Horowitz, L. M., Rosenberg, S. E., & Bartholomew, K. (1993). Interpersonal problems, attachment styles, and outcome in brief dynamic psychotherapy. *Journal of Consulting and Clinical Psychology*, *61*(4), 549.

Kalmakis, K. A., & Chandler, G. E. (2014). Adverse childhood experiences: towards a clear conceptual meaning. *Journal of Advanced Nursing*, *70*(7), 1489-1501.

Kim, J., & Cicchetti, D. (2004). A longitudinal study of child maltreatment, mother–child relationship quality and maladjustment: The role of self-esteem and social competence. *Journal of Abnormal Child Psychology*, *32*(4), 341-354.

McLean, C. P., Rosenbach, S. B., Capaldi, S., & Foa, E. B. (2013). Social and academic functioning in adolescents with child sexual abuse-related PTSD. *Child Abuse & Neglect*, *37*(9), 675.

Moos, R. & Moos, B. (1994). *Family Environment Scale Manual: Development, Applications, Research - Third Edition*. Palo Alto, CA: Consulting Psychologist Press.

Muela, A., Balluerka, N., Amiano, N., Caldentey, M. A., & Aliri, J. (2017). Animal-assisted psychotherapy for young people with behavioural problems in residential care. *Clinical Psychology & Psychotherapy*, *24*(6), O1485-O1494.

National Child Traumatic Stress Network (n/d). Interventions. From: https://www.nctsn.org/treatments-and-practices/trauma-treatments/interventions

Perlman, S. B., Kalish, C. W., & Pollak, S. D. (2008). The role of maltreatment experience in children's understanding of the antecedents of emotion. *Cognition & Emotion*, *22*(4), 651-670.

Petty, S. C., Sachs-Ericsson, N., & Joiner Jr, T. E. (2004). Interpersonal functioning deficits: temporary or stable characteristics of depressed individuals?. *Journal of Affective Disorders*, *81*(2), 115-122.

Powell, T. M., & Bui, T. (2016). Supporting social and emotional skills after a disaster: Findings from a mixed methods study. *School Mental Health*, *8*(1), 106-119.

Punamäki, R. L., Komproe, I. H., Qouta, S., Elmasri, M., & de Jong, J. T. (2005). The role of peritraumatic dissociation and gender in the association between trauma and mental health in a Palestinian community sample. *American Journal of Psychiatry*, *162*(3), 545-551.

Reynolds, C. R., & Kamphaus, R. W. (1992). Behavior Assessment System for Children: Manual. Circle Pines, MN: American Guidance Service.

Rivard, J. C., Bloom, S. L., McCorkle, D., & Abramovitz, R. (2005). Preliminary results of a study examining the implementation and effects of a trauma recovery framework for youths in residential treatment. *Therapeutic Community: The International Journal for Therapeutic and Supportive Organizations*, *26*(1), 83-96.

Rizzo, C. J., Joppa, M., Barker, D., Collibee, C., Zlotnick, C., & Brown, L. K. (2018). Project Date SMART: a dating violence (DV) and sexual risk prevention program for adolescent girls with prior DV exposure. *Prevention Science*, 1-11.

Segrin, C. (2001). *Interpersonal Processes in Psychological Problems*. Guilford Press.

Shahar, G., Joiner Jr, T. E., Zuroff, D. C., & Blatt, S. J. (2004). Personality, interpersonal behavior, and depression: Co-existence of stress-specific moderating and mediating effects. *Personality and Individual Differences*, *36*(7), 1583-1596.

Turner, H. A., Finkelhor, D., Shattuck, A., & Hamby, S. (2012). Recent victimization exposure and suicidal ideation in adolescents. *Archives of Pediatrics & Adolescent Medicine*, *166*(12), 1149-1154.

van der Kolk, B. A. (2003). The neurobiology of childhood trauma and abuse. *Child and Adolescent Psychiatric Clinics of North America*, *12*(2), 293-318.

Vittengl, J. R., Clark, L. A., & Jarrett, R. B. (2003). Interpersonal problems, personality pathology, and social adjustment after cognitive therapy for depression. *Psychological Assessment*, *15*(1), 29.

Chapter VI

Discussion

Overview

The purpose of this study was to examine the relationship between trauma, interpersonal problems, and PTSD in trauma-exposed adolescents. This study had two aims for the secondary data analysis portion: 1) To examine the relationship between childhood trauma, interpersonal problems, and PTSD, and to test a model that links childhood trauma with PTSD via interpersonal problem, and 2) To explore the relationship between childhood trauma type (interpersonal and non-interpersonal), interpersonal problems, and PTSD, and to test models that link childhood trauma type with PTSD via interpersonal problems. Additionally, in a scoping literature review: 3) To examine the content, efficacy, and generalizability of interventions that, at least in part, focus on improving interpersonal problems in those who have experienced trauma. This chapter will summarize the findings and discuss the results. The secondary analyses results will be discussed by aim. The scoping review results will be incorporated into the nursing practice implications section. At the end of this chapter, the limitations and implications of these findings will also be discussed.

Aim 1 and 2 used data from the National Child Traumatic Stress Network (NCTSN) Core Data Set (CDS). The CDS consists of over 10,000 children and adolescents seeking treatment in hospitals, residential treatment facilities, and outpatient clinics for their trauma. The data were collected from 56 sites throughout the United States from 2004 to 2010. The CDS is part of a

quality improvement effort by the NCTSN and is designed to improve care for trauma-exposed children and adolescents. The CDS systematically measured demographics, trauma exposure, service utilization, client functioning, and evidence-based treatment for trauma affected youth. Given that the data were collected from sites throughout the United States, the data has the potential to be generalizable to a national sample. About one quarter of the sample met full PTSD criteria (24.3%), but a much higher number of the sample experienced PTSD symptoms (74.6% for re-experiencing/ intrusion, 53.2% for avoidance, and 75.9% for hyperarousal). Although the number of adolescents who met full PTSD criteria was low, the rate is similar to other studies that have examined PTSD rates in youth. Adolescents frequently do not meet criteria for a full PTSD diagnosis, but still have severe symptoms that can interfere with functioning (Newman, 2002). Therefore, examining relationships that explain the relationship between trauma and PTSD severity is insightful given the high rates of PTSD symptoms in this sample.

Aim 1

The focus of Aim 1 was to examine the relationship between childhood trauma, interpersonal problems, and PTSD, and to test a model that links childhood trauma with PTSD via interpersonal problems. Although previous research supports a relationship between trauma and interpersonal problems (Elliott, Cunningham, Linder, Colangelo, & Gross, 2005; Kim & Cicchetti, 2004; Perlman, Kalish, & Pollak, 2008; Burack et al., 2006; DePrince, Chu, & Combs, 2008), and between interpersonal problems and PTSD (Hyman et al., 2003; Brewin et al., 2000; Trickey et al., 2012), this study was unique as it examined for the potential mediating role of interpersonal problems in the relationship between trauma and PTSD. The findings support that

interpersonal problems, in the form of social problem behaviors, partially mediated the relationship between childhood trauma and PTSD symptom severity.

Surprisingly, although aggressive behaviors were associated with trauma, they did not mediate the relationship trauma and PTSD symptom severity. Aggressive behaviors were not significant in explaining PTSD symptom severity after accounting for the association of social problem behaviors on PTSD symptom severity. Aggression is often associated with poor peer relationships (Card, Stucky, Sawalani, & Little, 2008; Leary, Twenge, & Quinlivan, 2006; Laible et al., 2000), so was used in this study as a way to capture interpersonal problem behaviors. Previous research has found an association between aggression and PTSD (Marsee, 2008; Silvern & Griese, 2012), but these studies did not also account for social problem behaviors. Therefore, social problem behaviors could be more important than aggressive behaviors in explaining PTSD symptom severity.

Another possible explanation for the differing mediation relationships that were found (i.e. partial mediation for social problem behaviors, no mediation for aggressive behaviors) could be related to items included in the social problem behaviors subscale. Certain items of the social problem behaviors subscale appear to capture peer rejection (e.g. “complains of loneliness”, “gets teased a lot”, “not liked by other kids”). Although the aggressive behavior items reflect interpersonal problems, they appear to capture behaviors toward others (e.g. “cruelty, bullying, or meanness to others”, “physically attacks people”, “threatens people”; Achenbach & Rescorla, 2001). Previous research has found that social acceptance can buffer the negative impact of aggressive behavior on anxiety and depression (Bierman & Wargo, 1995; Prinstein & La Greca, 2004). Similarly, social acceptance could buffer the negative impact of aggressive behaviors on PTSD. Youth who are able to maintain positive relationships even with their aggressive

behaviors may be at less risk for developing PTSD. Whereas youth who are rejected by peers may be at greater risk for PTSD. Since this study did not directly measure peer rejection and its relation to aggression and PTSD, future research would benefit from examining if this hypothesized relationship is true.

Aim 2

The focus of Aim 2 was to explore the relationship between childhood trauma type (interpersonal and non-interpersonal), interpersonal problems, and PTSD, and to test models that link childhood trauma type with PTSD via interpersonal problems. Three models were completed for this aim. Overall, the models support that interpersonal traumas have a greater impact on PTSD symptoms through social problem behaviors, compared to non-interpersonal traumas. Given that interpersonal traumas occur as the result of actions by another person, can disrupt one's principles of justice, autonomy, beneficence, and dignity, and can be stigmatizing (Punamaki et al., 2005; Ford, 2017), compared to non-interpersonal traumas that do not occur as a result of actions by another person, are not chronic, and do not lead to maladaptive cognitions like interpersonal traumas do (Tolin & Foa, 2006; Alisic et al., 2014), it makes sense that interpersonal traumas have a greater impact on PTSD symptoms than non-interpersonal traumas. Previous research supports that interpersonal traumas are associated with higher rates of PTSD than non-interpersonal traumas (Alisic et al., 2014; Kerig et al., 2009; Frans et al., 2005; Shalev & Freedman, 2005), and this study found similar results, since PTSD symptom scores in the interpersonal trauma model were higher than PTSD symptom scores in the non-interpersonal trauma model.

Depending on the model, interpersonal problems, in the form of social problem behaviors, partially or fully mediated the relationship between interpersonal traumas and PTSD

symptom severity. While previous research supports an association between interpersonal trauma, interpersonal problems, and PTSD (McLean et al., 2013; Beck, Grant, Clapp, & Palyo, 2008), none of these previous studies examined if interpersonal problems act as a mediator between interpersonal trauma and PTSD. Therefore, this study uniquely examined if interpersonal problems act as a mediator between interpersonal trauma and PTSD. The models also provide evidence for differences between interpersonal and non-interpersonal trauma and the role of interpersonal problems as mediators. Interpersonal problems did not mediate the relationship between non-interpersonal trauma and PTSD symptom severity in any of the models. In fact, there were no significant relationships between non-interpersonal trauma, interpersonal problems, and PTSD symptom severity. This contradicts a previous study by Bolton and colleagues (2004), who found an association between interpersonal problems and PTSD in adolescents who survived a sinking ship, a non-interpersonal trauma.

Interestingly, when comparing the three models that examined the relationship between trauma type, interpersonal problems, and PTSD symptom severity, the model that only included youth exposed to an interpersonal trauma supported a full mediation role for social problem behaviors, whereas the model that included youth exposed to interpersonal and non-interpersonal traumas supported a partial mediation role for social problem behaviors. Although both models support the importance of interpersonal problems in the relationship between interpersonal trauma and PTSD symptom severity, further clarifying why the different mediation effects were found could also inform interventions. One possible explanation for this could be that youth who experienced both types of trauma experienced more positive support after experiencing the non-interpersonal trauma, since non-interpersonal traumas are less stigmatizing than interpersonal traumas (Punamaki et al., 2005; Ford, 2017), that then reduced social problem behaviors and

acted as a protective factor for PTSD. However, this study did not measure social support, so this explanation cannot be tested with the data. Future research would benefit from examining the relationship between social problem behaviors and social support (i.e. are social problem behaviors negatively associated with social support?), and how both are related to PTSD symptom severity to help advance knowledge.

Post-Hoc Analyses

In all the models, females had higher rates of PTSD than males. Therefore, a post hoc analysis was completed to examine potential differences in the interpersonal trauma only model (Model 2) by gender, this model was selected because in this model social problem behaviors fully mediated the relationship between interpersonal trauma and PTSD symptom severity. For the female only model, social problem behaviors fully mediated the relationship between interpersonal trauma and PTSD symptom severity. For males, the relationship between interpersonal trauma and PTSD symptom severity was not mediated by either social problem behaviors or aggressive behaviors. In fact, few of the direct pathways were even significant in the males-only model. The only significant relationship in the males-only model was an association between social problem behaviors and PTSD symptom severity; such that higher social problem behaviors were associated with higher PTSD symptom severity. This pathway was also significant in the females-only model.

Although there is not a clear explanation for these gender differences, a possible explanation relates to friendship differences between males and females. Adolescent girls tend to report more close friends and greater intimacy among friends than adolescent boys (Hall, 2011; Urberg, Degirmencioglu, Tolson, & Halliday-Scher, 1995). Thus, a disruption in friendship and positive peer relationships could impact females more than males. Interestingly, high social

problem behaviors were associated with PTSD symptom severity for males, indicating that males with high social problem behaviors may be at greater risk of developing PTSD symptoms. While the model results provide knowledge that social problem behaviors would be helpful to intervene on for females exposed to interpersonal traumas, these findings also highlight the need to further examine why there is an association between interpersonal trauma and social problem behaviors in females exposed to interpersonal traumas, but not in males exposed to interpersonal trauma.

Socio-Demographic Differences

All socio-demographic variables were included in the model because of their significant correlations with the variables and based on previous literature. This section will discuss the variables and previous literature that supports the relationships to provide evidence for the inclusion of the variable.

Race/ Ethnicity. Each model, except for Model 3, had differences in trauma exposure based on race. In Model 1 and Model 4, Black youth had lower rates of trauma, and interpersonal trauma, respectively. Similarly, in Model 3, Hispanic youth had lower rates of interpersonal trauma. This is similar to other studies that have used the Core Data Set. Greeson and colleagues (2014) found that youth who had complex trauma histories were more likely to be White. In Model 1 and 4, youth of "Other" race had higher exposure to trauma and interpersonal trauma, respectively. Prior research supports that youth of "Other" race have higher exposure to certain types of traumatic events, such as physical assault or being threatened with a weapon (McLaughlin et al., 2013).

In all the models, except the non-interpersonal trauma only model (Model 3), youth who were Black had lower social problem behaviors. This could be related to cultural differences. African Americans may place a greater value on interdependence and kinship networks than

Whites (Jones, 2007). Additionally, community cohesion is negatively associated with PTSD symptoms in African Americans (Gapen et al., 2011). Given this, the Black youth in this sample could have had high community cohesion and kinship networks, which could explain the lower rates of social problem behaviors in this sample. In Models 1 and 2, Hispanic youth had lower aggressive behavior scores. This could be due to Hispanic's cultural beliefs, specifically, the emphasis on family and other moral norms could be a protective factor for violence (Mercado-Crespo & Mbah, 2013; Galanti, 2003).

Public insurance/ low SES. Youth on public insurance had higher exposure to trauma across models, except for the non-interpersonal trauma only model (Model 3). Public insurance was used as a proxy for low socioeconomic status. Prior literature supports that those of low socioeconomic status have higher trauma exposure (Hussey, Chang, & Kotch, 2006). Although in Model 4, public insurance was associated with higher rates of non-interpersonal trauma, this was not found in the model that only examined non-interpersonal trauma (Model 3). This could be explained by the traumas these youth experienced. Since Model 3 only included youth who experienced a non-interpersonal trauma, it makes sense that low socioeconomic status would not impact certain traumatic events, such as if one is hit with a natural disaster. However, youth with exposure to traumatic loss or separation, a non-interpersonal trauma, could explain why youth on public insurance had exposure to more non-interpersonal traumas. Low-income communities have higher rates of traumatic loss than middle and upper-income communities, due to the high rates of violence, homicide, and increased risk of illness (McCart et al., 2007; Stein et al., 2003; Hooyman & Kramer, 2008). Low income communities also have higher rates of trauma (Hussey, Chang, & Kotch, 2006), which could result in higher traumatic separation (e.g. children placed in foster care). Therefore, although traumatic loss or bereavement was included as a non-

interpersonal trauma, in accordance with previous research, if the loss or separation resulted from another interpersonal trauma (e.g. abuse, community violence), this could explain why youth on public insurance had higher non-interpersonal trauma exposure in Model 4. Similarly, if the traumatic loss or separation was due to an interpersonal trauma, this would have excluded youth from the non-interpersonal trauma subset and could explain why youth on public insurance in Model 3 did not have higher non-interpersonal trauma exposure.

In all the models except for the third model, youth on public insurance had higher social problem scores, which is supported by previous research (Winer & Thompson, 2013). This could be related to high levels of mistrust that can occur in disadvantaged neighborhoods (Ross, Mirowsky, & Pribesh, 2001). Similarly, in all of the models except for the third model, youth on public insurance had higher scores on the aggressive behavior subscale than youth on private insurance. Previous research supports that poverty predicts violence, possibly due to feelings of frustration and injustice (Valois, MacDonald, Bretous, Fischer, & Drane, 2002).

Strengths and Limitations

This study had several strengths. First, the sample used in this study is a large, clinical sample of adolescents seeking assessment and treatment services for their trauma from 56 sites throughout the United States. Therefore, the findings are likely generalizable to a variety of youth who have experienced trauma. It also makes the findings clinically relevant, with the ability to impact clinical practice. This data set is specific to youth who have trauma histories, making it fitting for these analyses. Second, the measures used in this study demonstrate good reliability and validity. Finally, this study is unique in the number of traumatic events the youth have been exposed to; as twenty different types of trauma are reported. Few studies have included such a comprehensive list (e.g. the ACE's study only includes 10 traumatic events).

As with all studies, there are limitations to this study that are important to keep in mind when interpreting study findings. First, the data were cross-sectional, so a cause and effect relationship cannot be determined. Since the data were all collected at one point in time, it is unclear of the order the events occurred in. Although the PTSD, by its definition, results after the trauma occurs, it is impossible to know if the interpersonal problems occurred after the trauma and before the PTSD. Previous longitudinal research, however, supports the hypothesis that interpersonal relationships can impact PTSD development (Brewin et al., 2000; Hyman, Gold, Cott, 2003; Trickey et al., 2012). Thus, it is quite plausible that the interpersonal problems occurred before PTSD, but it cannot be proven in this analysis. Second, this was a secondary data analysis, so the variables used were limited to those used in the Core Data Set. Specifically, the measure for PTSD, the UCLA PTSD-RI, measures DSM-IV PTSD rather than DSM-V. The findings are still insightful, however, given that the symptom clusters of re-experiencing, avoidance, and hyperarousal are part of both DSM-IV and DSM-V. Future research would benefit from examining the same relationships using DSM-V criteria for PTSD. Finally, there is a limitation in the sample that was used. While the sample consists of a large sample of youth seeking treatment for trauma from 56 sites throughout the United States, it does not encompass youth who are not seeking treatment. While this provides a strong clinical sample with several clinical implications, it is limited in the ability to infer about community samples of youth who may not be getting needed treatment or may not have access to treatment.

Implications

Findings from this study have implications for future research and for nursing clinical practice.

Research implications.

The findings have implications for future research in a number of ways. First, the study findings should be replicated in different samples to verify the relationships with different samples of youth. Although this study used a large clinical sample of youth from a variety of races and ethnicities who were exposed to a range of trauma types, it only included youth who were seeking treatment. Therefore, examining the relationship in youth who may not have access to treatment would be beneficial. Additionally, examining other potential confounding variables and constructs that were not included in these analyses may be beneficial (e.g. culture, religion, community cohesion, social support, peer rejection).

This study examined a model whereby it was purported that interpersonal problems occurred before PTSD, given research that supports that poor peer relationships contribute to a PTSD diagnosis; however, it could be that PTSD actually contributes to the interpersonal problems. For instance, in a sample of adolescents who survived a sinking ship, PTSD symptoms were associated with impairments in friendship and social functioning (Bolton et al., 2004). In a different sample of youth with childhood sexual abuse histories, greater PTSD symptom severity was associated with worse social functioning (McLean et al., 2013). Research also supports an association between PTSD and problems with trust, closeness, and peer relationships (Beck, Grant, Clapp, & Palyo, 2008; McFarlane & Bookless, 2001). Given the cross-sectional nature of the data, future research would benefit from examining the relationships longitudinally to verify directionality, where trauma leads to interpersonal problems, and then the interpersonal problems lead to PTSD symptom severity.

Previous research supports that negative, conflicting relationships have more of an impact on PTSD than positive support (Andrews et al., 2003; Borja, Callahan, & Long, 2006; Zoellner, Foa, & Brigidi, 1999) however, it could be that both interpersonal problems and social

support play a role in PTSD symptom severity. For example, social support may still act as a protective factor on PTSD symptom severity. Future research would benefit from examining how interpersonal problems and social support are related to each other (e.g. do people with interpersonal problems have poor social support?) and how each contribute to PTSD symptom severity when both are included in a model.

This study categorized traumatic loss and bereavement as a non-interpersonal trauma, in accordance with previous research that has examined interpersonal and non-interpersonal trauma subsets (Alisic et al., 2014). However, it is important to note that the traumatic loss or bereavement category also included youth separated from parents (e.g. placed in foster care). Youth who were separated from parents, or youth who experienced a traumatic loss that occurred because of an interpersonal trauma (e.g. homicide), may still have interpersonal problems. Although this study did not examine the reason for the traumatic loss, future reason may benefit from examining if youth who experienced loss due to an interpersonal trauma still experience interpersonal problems.

Future research would benefit from examining if there are any developmental differences in the models. Since this sample specifically included adolescents, examining the impact of interpersonal problems in children has the potential to improve future treatments. Further, examining if there are any differences in the models between early and late adolescence could inform further knowledge and the potential need to differ treatments based on age. Additionally, given research that traumatic events that occur in childhood are associated with higher rates of PTSD than traumatic events that occur in adolescence (McCutcheon et al., 2010), examining these models for differences based on the age of trauma occurrence and if that plays a role in outcomes would be interesting.

Performing qualitative analyses could also add insight to the findings. Although cross-sectional data were examined in this study and the findings highlight the importance of social problem behaviors in explaining the association between trauma and PTSD symptom severity, running focus groups with youth who have experienced trauma could also add to the findings. For instance asking youth questions about their relationships after a traumatic experience, their interpersonal problems, and PTSD symptoms (e.g. how did the traumatic even impact your relationships? Was social support important?) could add further knowledge into adolescent relationships and how they are important in the association between trauma and PTSD symptom severity.

Finally, when examining the intervention studies from the scoping review, none of the studies used the same measure to examine outcomes specific to interpersonal problems. This makes it difficult to compare outcomes between interventions and identify which intervention worked the best. Future research may benefit from comparing the different measures used and identifying which measures seem to capture the concept of interpersonal problems the most accurately. Comparing the validity and reliability of the measures, specifically in adolescents of various races and ethnicities and from different settings, could inform what measure to use in future research.

Nursing practice implications.

Despite the aforementioned limitations, the findings underscore the need to target interpersonal problems in adolescents exposed to interpersonal traumas. The findings also further emphasize the need to target interventions based on trauma type. As identified in the scoping review, interventions do exist that address interpersonal problems in trauma-exposed adolescents. The content of these interventions varied based on trauma type. The intervention

that included youth exposed to a non-interpersonal trauma included content on building support networks (Powell & Bui, 2016). The interventions that included youth exposed to an interpersonal trauma included content that could address interpersonal problems, such as learning communication skills, conflict resolution skills, healthy boundaries, and providing support and connecting with others.

Since the results of this dissertation suggest that social problem behaviors mediated or partially mediated the relationship between interpersonal trauma and PTSD symptom severity, content on improving social problem behaviors could be the most useful in interventions for youth exposed to interpersonal traumas. For instance, teaching and practicing communication skills and connecting with peers could be the most helpful for youth exposed to an interpersonal trauma, since this has the potential to improve social problem behaviors. Youth exposed to trauma can have dysregulation and limited use of the prefrontal cortex (Cook et al., 2017; Bremner, 2006), so while relationship skills, such as boundaries and communication skills, could be beneficial for improving social problem behaviors, establishing trusting relationships and connections is also important. Because of the impairment in abstract thinking, youth who have experienced trauma also need regulation skills in order to use the skills they learned; if they are dysregulated they will not be able to use skills that require the prefrontal cortex. Therefore, while teaching skills that improve social problem behaviors is important given these findings, it is imperative that trauma-exposed youth who are experiencing dysregulation still get trauma treatments that will improve the regulation skills. Since social problem behaviors did not mediate the relationship between non-interpersonal trauma and PTSD symptom severity, content on improving social problem behaviors might not benefit these adolescents. Additionally, none of the interventions differed content based on gender. Given the findings of this study that social

problem behaviors fully mediated the relationship between interpersonal trauma and PTSD symptom severity in females, interventions that target social problem behaviors may be the most beneficial for females. However, males with high rates of social problem behaviors may still benefit from these interventions.

Of the interventions identified in the scoping review, none of the interventions were performed by nurses, which is a significant limitation. Nurses are the largest healthcare occupation in the United States (Bureau of Labor Statistics, 2015), and as such should be utilized more in mental health interventions given their range of expertise and capacity. The American Nurses Association defines nursing as "the protection, promotion, and optimization of health and abilities; prevention of illness and injury; facilitation of healing; alleviation of suffering through the diagnosis and treatment of human response; and advocacy in the care of individuals, families, groups, communities, and populations" (American Nurses Association, 2015). Additionally, in *The Essentials of Baccalaureate Education for Professional Nursing Practice* (2008), the American Association of Colleges of Nursing emphasizes a focus on individual and population-focused interventions as a necessary skill for baccalaureate prepared nurses. Given this, nurses, especially psychiatric-mental health nurses, would be a great resource to help with interventions for trauma-exposed youth.

Nurses can also practice in a variety of settings, including schools, hospitals, and outpatient clinics, and therefore have access to youth in a variety of locations. Given the need to help youth who may not have access to care, nurses could help to bridge that gap. For instance, community health nurses could help run interventions for youth in at-risk communities who may not otherwise have access to care. It is important to note that although nurses could be utilized more in interventions for trauma-exposed youth to help treat more youth, working in a team with

other healthcare professionals is still important, given the variety of skills and expertise of different healthcare disciplines. Interprofessional collaboration is associated with improved patient outcomes (Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013). Therefore, utilizing the full healthcare team would be beneficial to help traumatized youth. Also, one identified gap in location was the lack of interventions that took place in inpatient hospital settings. Although youth admitted to an inpatient unit typically have a shorter stay, it may not be ideal for all interventions. However, creating an intervention for the inpatient setting that is shorter in length could possibly be beneficial to help the large number of trauma-exposed youth admitted to hospital settings.

Conclusion

This study contributes to our understanding of the role interpersonal problems play in the relationship between trauma and PTSD symptom severity in youth exposed to a range of traumas. Using path analyses, this study found four models that described these relationships and fit the data well. The first model found that social problem behaviors partially mediated the relationship between general trauma history and PTSD symptom severity. The second model examined a subsample of youth who just experienced interpersonal traumas. In this model, social problem behaviors fully mediated the relationship between interpersonal trauma and PTSD symptom severity. In the third model, which consisted of a subsample of youth who just experienced non-interpersonal traumas, there were no significant mediating relationships. Finally, the fourth model, which examined the relationships using both interpersonal and non-interpersonal traumas as the exogenous variables, found that social problem behaviors partially mediated the relationship between interpersonal trauma and PTSD symptom severity, but not the relationship between non-interpersonal trauma and PTSD symptom severity.

This was the first study, to my knowledge, that examined the role interpersonal problems have in the relationship between trauma and PTSD symptom severity in adolescents, and further explored potential differences in that relationship based on trauma type. Although further research is needed, the findings support that interpersonal problems, specifically social problem behaviors, do play a role in PTSD symptom severity for trauma-exposed youth. Additionally, interpersonal traumas appear to impact social problem behaviors, but non-interpersonal traumas do not appear to impact social problem behaviors. The findings inform the potential need for interventions that target social problem behaviors in traumatized youth, especially in youth exposed to interpersonal traumas.

References

Achenbach, T. M., & Rescorla, L. (2001). ASEBA school-age forms & profiles.

Alisic, E., Zalta, A. K., Van Wesel, F., Larsen, S. E., Hafstad, G. S., Hassanpour, K., & Smid, G. E. (2014). Rates of post-traumatic stress disorder in trauma-exposed children and adolescents: Meta-analysis. *The British Journal of Psychiatry*, *204*(5), 335-340.

American Association of Colleges of Nursing (2008). The essentials of baccalaureate education for professional nursing practice. Washington, DC. Received from: http://www.aacn.nche.edu/education-resources/BaccEssentials08.pdf

American Nurses Association (2018). Scope of Practice. Received from: https://www.nursingworld.org/practice-policy/scope-of-practice/

Andrews, B., Brewin, C. R., & Rose, S. (2003). Gender, social support, and PTSD in victims of violent crime. *Journal of Traumatic Stress*, *16*(4), 421-427.

Beck, J. G., Grant, D. M., Clapp, J. D., & Palyo, S. A. (2008). Understanding the interpersonal impact of trauma: Contributions of PTSD and depression. *Journal of Anxiety Disorders*, *23*(4), 443-450.

Bierman, K. L., & Wargo, J. B. (1995). Predicting the longitudinal course associated with aggressive-rejected, aggressive (nonrejected), and rejected (nonaggressive) status. *Development and Psychopathology*, *7*(4), 669-682.

Borja, S. E., Callahan, J. L., & Long, P. J. (2006). Positive and negative adjustment and social support of sexual assault survivors. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *19*(6), 905-914.

Bremner, J. D. (2006). Traumatic stress: effects on the brain. *Dialogues in Clinical Neuroscience*, *8*(4), 445.

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

Bolton, D., Hill, J., O'ryan, D., Udwin, O., Boyle, S., & Yule, W. (2004). Long-term effects of psychological trauma on psychosocial functioning. *Journal of Child Psychology and Psychiatry*, *45*(5), 1007-1014.

Burack, J. A., Flanagan, T., Peled, T., Sutton, H. M., Zygmuntowicz, C., & Manly, J. T. (2006). Social perspective-taking skills in maltreated children and adolescents. *Developmental Psychology*, *42*(2), 207.

Bureau of Labor Statistics (2015). U.S. Department of Labor, *The Economics Daily*, Registered nurses have highest employment in healthcare occupations; anesthesiologists earn the most. Retrieved from: https://www.bls.gov/opub/ted/2015/registered-nurses-have-highest-employment-in-healthcare-occupations-anesthesiologists-earn-the-most.htm

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development*, *79*(5), 1185-1229.

Cook, A., Spinazzola, J., Ford, J., Lanktree, C., Blaustein, M., Cloitre, M., ... & Mallah, K. (2017). Complex trauma in children and adolescents. *Psychiatric Annals*, *35*(5), 390-398.

DePrince, A. P., Chu, A. T., & Combs, M. D. (2008). Trauma-related predictors of deontic reasoning: A pilot study in a community sample of children. *Child Abuse & Neglect*, 32, 732–737.

Elliott, G. C., Cunningham, S. M., Linder, M., Colangelo, M., & Gross, M. (2005). Child physical abuse and self-perceived social isolation among adolescents. *Journal of Interpersonal Violence*, *20*(12), 1663-1684.

Frans, O., Rimmo, P. A., Aberg, L., Fredrikson, M. (2005). Trauma exposure and post-traumatic stress disorder in the general population. *Acta Psychiatr. Scand*. 111(4):291–99.

Ford, J. (2017). Complex trauma and complex posttraumatic stress disorder in *APA Handbook of Trauma Psychology: Foundations in Knowledge, Vol. 1*. Chapter 15.

Galanti, G. A. (2003). The Hispanic family and male-female relationships: An overview. *Journal of Transcultural Nursing*, *14*(3), 180-185.

Gapen, M., Cross, D., Ortigo, K., Graham, A., Johnson, E., Evces, M., ... & Bradley, B. (2011). Perceived neighborhood disorder, community cohesion, and PTSD symptoms among low-income African Americans in an urban health setting. *American Journal of Orthopsychiatry*, *81*(1), 31.

Greeson, J. K., Briggs, E. C., Layne, C. M., Belcher, H. M., Ostrowski, S. A., Kim, S., ... & Fairbank, J. A. (2014). Traumatic childhood experiences in the 21st century: Broadening and building on the ACE studies with data from the National Child Traumatic Stress Network. *Journal of Interpersonal Violence*, *29*(3), 536-556.

Hall, J. A. (2011). Sex differences in friendship expectations: A meta-analysis. *Journal of Social and Personal Relationships,* 28(6), 723-747. https://doi.org/10.1177/0265407510386192

Hooyman, N. R., & Kramer, B. J. (2008). *Living Through Loss: Interventions Across the Lifespan*. Columbia University Press.

Hussey, J. M., Chang, J. J., & Kotch, J. B. (2006). Child maltreatment in the United States: prevalence, risk factors, and adolescent health consequences. *Pediatrics*, *118*(3), 933-942.

Hyman, S. M., Gold, S. N., & Cott, M. A. (2003). Forms of social support that moderate PTSD in childhood sexual abuse survivors. *Journal of Family Violence*, *18*(5), 295-300.

Jones, J. M. (2007). Exposure to chronic community violence: Resilience in African American children. *Journal of Black Psychology*, *33*(2), 125-149.

Kerig, P. K., Ward, R. M., Vanderzee, K. L., & Moeddel, M. A. (2009). Posttraumatic stress as a mediator of the relationship between trauma and mental health problems among juvenile delinquents. *Journal of Youth and Adolescence*, *38*(9), 1214-1225.

Kim, J., & Cicchetti, D. (2004). A longitudinal study of child maltreatment, mother–child relationship quality and maladjustment: The role of self-esteem and social competence. *Journal of Abnormal Child Psychology*, *32*(4), 341-354.

Laible, D. J., Carlo, G., & Raffaelli, M. (2000). The differential relations of parent and peer attachment to adolescent adjustment. *Journal of Youth and Adolescence*, *29*(1), 45-59.

Leary, M. R., Twenge, J. M., & Quinlivan, E. (2006). Interpersonal rejection as a determinant of anger and aggression. *Personality and Social Psychology Review*, *10*(2), 111-132.

Marsee, M. A. (2008). Reactive aggression and posttraumatic stress in adolescents affected by Hurricane Katrina. *Journal of Clinical Child & Adolescent Psychology*, *37*(3), 519-529.

McCart, M. R., Smith, D. W., Saunders, B. E., Kilpatrick, D. G., Resnick, H., & Ruggiero, K. J. (2007). Do urban adolescents become desensitized to community violence? Data from a national survey. *American Journal of Orthopsychiatry*, *77*(3), 434-442.

McCutcheon, V. V., Sartor, C. E., Pommer, N. E., Bucholz, K. K., Nelson, E. C., Madden, P. A., & Heath, A. C. (2010). Age at trauma exposure and PTSD risk in young adult women. *Journal of Traumatic Stress*, *23*(6), 811-814.

McLaughlin, K. A., Koenen, K. C., Hill, E. D., Petukhova, M., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2013). Trauma exposure and posttraumatic stress disorder in a national sample of adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *52*(8), 815-830.

McLean, C. P., Rosenbach, S. B., Capaldi, S., & Foa, E. B. (2013). Social and academic functioning in adolescents with child sexual abuse-related PTSD. *Child Abuse & Neglect*, *37*(9), 675.

Mercado-Crespo, M. C., & Mbah, A. K. (2013). Race and ethnicity, substance use, and physical aggression among US high school students. *Journal of Interpersonal Violence*, *28*(7), 1367-1384.

Newman, E. (2002). Assessment of PTSD and trauma exposure in adolescents. *Journal of Aggression, Maltreatment & Trauma*, *6*(1), 59-77.

Norris, F. H., Perilla, J. L., Ibañez, G. E., & Murphy, A. D. (2001). Sex differences in symptoms of posttraumatic stress: Does culture play a role? *Journal of Traumatic Stress*, *14*(1), 7-28.

Olff, M. (2017). Sex and gender differences in post-traumatic stress disorder: An update. *European Journal of Psychotraumatology*, 1351204.

Olff, M., Langeland, W., Draijer, N., & Gersons, B. P. (2007). Gender differences in posttraumatic stress disorder. *Psychological Bulletin*, *133*(2), 183.

Perlman, S. B., Kalish, C. W., & Pollak, S. D. (2008). The role of maltreatment experience in children's understanding of the antecedents of emotion. *Cognition & Emotion*, *22*(4), 651-670.

Pineles, S. L., Hall, K. A. A., & Rasmusson, A. M. (2017). Gender and PTSD: Different pathways to a similar phenotype. *Current Opinion in Psychology*, *14*, 44-48.

Prinstein, M. J., & La Greca, A. M. (2004). Childhood peer rejection and aggression as predictors of adolescent girls' externalizing and health risk behaviors: A 6-year longitudinal study. *Journal of Consulting and Clinical Psychology*, *72*(1), 103.

Punamäki, R. L., Komproe, I. H., Qouta, S., Elmasri, M., & de Jong, J. T. (2005). The role of peritraumatic dissociation and gender in the association between trauma and mental health in a Palestinian community sample. *American Journal of Psychiatry*, *162*(3), 545-551.

Reeves, S., Perrier, L., Goldman, J., Freeth, D., & Zwarenstein, M. (2013). Interprofessional education: Effects on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*, (3).

Ross, C. E., Mirowsky, J., & Pribesh, S. (2001). Powerlessness and the amplification of threat: Neighborhood disadvantage, disorder, and mistrust. *American Sociological Review*, 568-591.

Shalev A., & Freedman S (2005). PTSD following terrorist attacks: a prospective evaluation. *Am. J. Psychiatry* 162(6):1188–91

Silvern, L., & Griese, B. (2012). Multiple types of child maltreatment, posttraumatic stress, dissociative symptoms, and reactive aggression among adolescent criminal offenders. *Journal of Child & Adolescent Trauma*, *5*(2), 88-101.

Sperry, D. M., & Widom, C. S. (2013). Child abuse and neglect, social support, and psychopathology in adulthood: A prospective investigation. *Child Abuse & Neglect*, *37*(6), 415-425.

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

Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and posttraumatic stress disorder: A quantitative review of 25 years of research. *Psychological Bulletin*, *132*(6), 959.

Trickey, D., Siddaway, A. P., Meiser-Stedman, R., Serpell, L., & Field, A. P. (2012). A meta-analysis of risk factors for post-traumatic stress disorder in children and adolescents. *Clinical Psychology Review*, *32*(2), 122-138.

Urberg, K. A., Değirmencioğlu, S. M., Tolson, J. M., & Halliday-Scher, K. (1995). The structure of adolescent peer networks. *Developmental Psychology*, *31*(4), 540.

Valois, R. F., MacDonald, J. M., Bretous, L., Fischer, M. A., & Drane, J. W. (2002). Risk factors and behaviors associated with adolescent violence and aggression. *American Journal of Health Behavior*, *26*(6), 454-464.

Walker, J. L., Carey, P. D., Mohr, N., Stein, D. J., & Seedat, S. (2004). Gender differences in the prevalence of childhood sexual abuse and in the development of pediatric PTSD. *Archives of Women's Mental Health*, *7*(2), 111-121.

Winer, A. C., & Thompson, R. (2013). How poverty and depression impact a child's social and emotional competence. *Policy Brief, Center for Poverty Research*, *1*(10), 1-2.

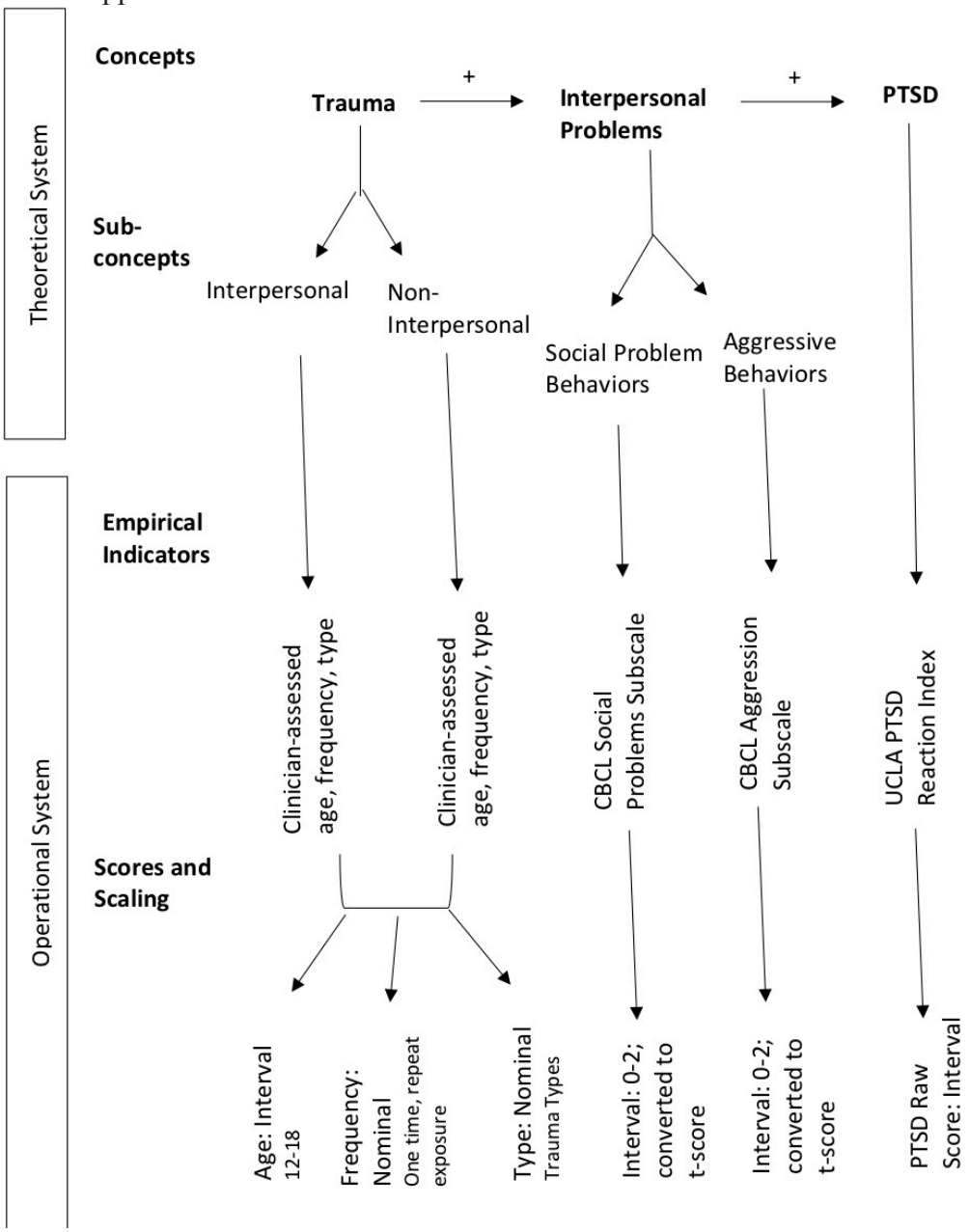
Zoellner, L. A., Foa, E. B., & Brigidi, B. D. (1999). Interpersonal friction and PTSD in female victims of sexual and nonsexual assault. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *12*(4), 689-700.

Appendices

Appendix A.

Substruction

Figure 12. Appendix A



Appendix B.

CBCL Social Problems and Aggressive Behaviors Subscale Items

Social Problems:
11- Clings to adults or too dependent
12- Complains of loneliness
25- Doesn't get along with other kids
27- Easily jealous
34- Feels others are out to get him/ her
36- Gets hurt a lot, accident-prone
38- Gets teased a lot
48- Not liked by other kids
62- Poorly coordinated or clumsy
64- Prefers being with younger kids
79- Speech problems

Aggressive Behaviors:
3- Argues a lot
16- Cruelty, bullying, or meanness to others
19- Demands a lot of attention
20- Destroys his/her own things
21- Destroys things belonging to his/her family or others
22- Disobedient at home
23- Disobedient at school
37- Gets in many fights
57- Physically attacks people
68- Screams a lot
86- Stubborn, sullen, or irritable
87- Sudden changes in mood or feeling

88- Sulks a lot
89- Suspicious
94- Swearing or obscene language
95- Temper tantrums
97- Threatens people
104- Unusually loud

Appendix C.

Data Analysis Plan

Table 19. Appendix C

Analytic Process Step	Decisions and Notes
1. Discuss proposal idea/ measures with NCTSN statistician	-Software to use for analysis: SAS -Clarify questions or issues with proposed analytic plan
2. Select sample and inclusion/ exclusion criteria a) Ages 12-18 b) Baseline data available c) Experienced at least one childhood trauma event	-Approximate sample is 4,041 based on preliminary frequencies
3. Construct variables	-Childhood trauma -1: YES -0: NO or UNKNOWN -Create summary variable for number of traumas -Interpersonal trauma -1: YES -0: NO or UNKNOWN -Create summary variable for number of traumas -Non-interpersonal trauma -1: YES -0: NO or UNKNOWN -Create summary variable for number of traumas -Interpersonal problems -Sum of social problems subscale; converted to t-score -Sum of aggression subscale; converted to t-score -PTSD -Sum of UCLA PTSD-RI
4. Check data descriptives Mean: PROC MEANS Frequency: PROC FREQ	-Continuous: Mean, median, mode, range, distribution -Categorical: Frequencies
5. Make sample characteristics table	- Descriptive statistics
6. Run correlations with all variables in models and demographic characteristics. Significant correlations will be included as control variables in the models, in accordance with previous literature.	-Gender -Race/ ethnicity -Public insurance status
7. Perform path analyses for first aim, testing the first model and different control variables Path analysis: PROC CALIS	-Finalize model -Robust Maximum Likelihood (MLR) will be used for estimation. Overall fit will be evaluated using Adjusted Goodness of Fit (AGFI), Root Mean Square Error of Approximation (RMSEA), and the Comparative Fit Index (CFI)

8. Perform path analyses for second aim, testing the three models	-Robust Maximum Likelihood (MLR) will be used for estimation. Overall fit will be evaluated using Adjusted Goodness of Fit (AGFI), Root Mean Square Error of Approximation (RMSEA), and the Comparative Fit Index (CFI)
9. Rerun models with different control variables and compare model fit; decide on model.	-Compare AGFI, RMSEA, and CFI
10. Make figures illustrating results	4 Models
11. Make tables illustrating significance of direct and indirect associations for each model.	3 Tables

Appendix D.

NCTSN Core Data Set Variable Names

Table 20. Appendix D

Construct	Variable	Variable Name
Dataset= BASELINE		
Demographics	Race Ethnicity Gender Age Public Insurance Primary residence	NEWRACE <NRACE> ETHNIC <CTDEET> GENDER <ZSEX> DOB <DATE> BCINPUB <ZYES> BPRIMRES<CTDORE>
Dataset= TRAUMA InForm Table= GENTRAUMA_1 and GENTRAUMA_2		
Trauma Type	Sexual maltreatment/ abuse Sexual assault/rape Physical maltreatment/ abuse Physical assault Emotional abuse/psychological maltreatment Neglect Domestic violence	GT1_<CTGETR> GT2 _<CTGETR> GT3 _<CTGETR> GT4 _<CTGETR> GT5 _<CTGETR> GT6 _<CTGETR> GT7 _<CTGETR>
Dataset= TRAUMA InForm Table= GENTRAUMA_2 and GENTRAUMA_3		
Trauma Type	War/terrorism/ political violence inside the U.S. War/terrorism/political violence outside the U.S. Illness/Medical trauma Serious injury/accident Natural disaster Kidnapping Traumatic loss or bereavement	GT8_<CTGETR> GT9_<CTGETR> GT10_<CTGETR> GT11_<CTGETR> GT12_<CTGETR> GT13_<CTGETR> GT14_<CTGETR>
Dataset= TRAUMA InForm Table= GENTRAUMA_3 and GENTRAUMA_4		
Trauma Type	Forced displacement Impaired Caregiver Extreme interpersonal violence Community violence School violence Other trauma (not reported elsewhere)	GT15_<CTGETR> GT16_<CTGETR> GT17_<CTGETR> GT18_<CTGETR> GT19_<CTGETR> GT20_<CTGETR>
Dataset= BASELINE InForm Table= CBCLOLD		

Interpersonal Problems- CBCL Social Problems Subscale	CBCL Social Problems Raw Score CBCL Social Problems Raw Score-Num CBCL Social Problems t-score	BCBSOR BCBSORN BCBSOTN
Interpersonal Problems- CBCL Aggression Subscale	CBCL Aggression Raw Score CBCL Aggression Raw Score-Num CBCL Aggression t-score	BCBABR BCBABRN BCBABTN
PTSD- UCLA PTSD-RI	PTSD Overall Raw Score PTSD score criteria PTSD criteria B cut-off PTSD criteria C cut-off PTSD criteria D cut-off	BPTSORN BPTSOC BPTSBC BPTSCC BPTSDC

Appendix E.

Search Terms

psycINFO:
((“Adolescent” OR “youth” OR “adolescence” OR “teen” OR “juvenile”)
AND
(“PTSD” OR “trauma” OR “adverse childhood experience” OR “ACE” OR “polyvictimization” OR “complex trauma” OR “violence” OR “neglect” OR “abuse”)
AND
(“Complementary therapy” OR “psychotherapy” OR “mental health services” OR “intervention” OR “therapy” OR “counseling” OR “program”)
AND
(“Social skills” OR “interpersonal skills” OR “interpersonal problem” OR “social problem” OR “social competence” OR “social ability” OR “emotional intelligence”))

PubMed:
(("Adolescent"[Mesh] OR "Minors"[Mesh] OR Youth [tw] OR youths [tw] OR Teen [tw] OR teens [tw] OR Teenager [tw] OR Adolescent [tw] OR Adolescence [tw] OR "Young person" [tw] OR "Young people" [tw] OR Juvenile [tw])
AND
("Violence"[Mesh] OR "Bullying"[Mesh] OR "Stress, Psychological"[Mesh:NoExp] OR "Child Abuse"[Mesh] OR "Battered Child Syndrome"[Mesh] OR "Physical Abuse"[Mesh] OR "Stress Disorders, Traumatic"[Mesh:NoExp] OR "Psychological Trauma"[Mesh] OR "Child Abuse, Sexual"[Mesh] OR "Human Rights Abuses"[Mesh] OR trauma[tw] OR PTSD[tw] OR “post-traumatic stress disorder”[tw] OR abuse[tw] OR abused [tw] OR abusing[tw] OR abusive[tw] OR traumas[tw] OR traumatic[tw] OR “battered child”[tw] OR “adverse childhood”[tw] OR ACE[tw] OR ACEs[tw] OR ACE’s[tw] OR “psychological stress”[tw] OR Bullying[tw] OR cyberbulling[tw] OR Violence[tw])
AND
("Complementary Therapies"[Mesh] OR "Self-Help Groups"[Mesh] OR "Psychotherapy"[Mesh] OR "Program Development"[Mesh] OR "Program Evaluation"[Mesh] OR "Mental Health Services"[Mesh] OR program[tw] OR programs[tw] OR programme[tw] OR programmes[tw] OR intervention[tw] OR interventions[tw] OR counseling[tw] OR psychotherapy[tw] OR therapy[tw] OR "support group"[tw] OR "support groups"[tw] OR "self help groups")
AND
("Friends"[Mesh] OR "Emotional Intelligence"[Mesh] OR "Interpersonal Relations"[Mesh:NoExp] OR "Social Skills"[Mesh] OR Interpersonal[tw] OR "Social Skills"[tw] OR "Social abilities"[tw] OR "Social ability"[tw] OR "Social competence"[tw] "Emotional Intelligence"[tw] OR friends[tw]))

CINAHL:
((“Adolescent” OR “youth” OR “adolescence” OR “teen” OR “juvenile”)
AND
(“PTSD” OR “trauma” OR “adverse childhood experience” OR “ACE” OR “polyvictimization” OR “complex trauma” OR “violence” OR “neglect” OR “abuse”)
AND
(“Complementary therapy” OR “psychotherapy” OR “mental health services” OR “intervention” OR “therapy” OR “counseling” OR “program”)
AND
(“Social skills” OR “interpersonal skills” OR “interpersonal problem” OR “social problem” OR “social competence” OR “social ability” OR “emotional intelligence”