Interpersonal Trauma Exposure and Interpersonal Problems in Adolescent Posttraumatic Stress Disorder

Kathryn A. Hughesdon[1], Julian D. Ford[2], Ernestine C. Briggs[3], Julia S. Seng[4], Alison L. Miller[5], & Sarah A. Stoddard[4]

[1]School of Nursing, Eastern Michigan University, Ypsilanti, Michigan, USA

[2]Department of Psychology, University of Connecticut, Farmington, Connecticut, USA

[3]School of Medicine, Duke University, Durham, North Carolina, USA

[4]School of Nursing, University of Michigan, Ann Arbor, Michigan, USA

[e]School of Public Health, University of Michigan, Ann Arbor, Michigan, USA

**Author Note**

Network that have contributed data to the Core Data Set and the children and families who have

contributed to our growing understanding of child traumatic stress.

Correspondence concerning this article should be addressed to Kathryn Hughesdon, School

of Nursing, Eastern Michigan University, 318F Porter, Ypsilanti, MI, 48197, USA. Email:

kabramos@emich.edu

**Abstract**

Traumatic experiences have been differentiated as interpersonal (i.e., the direct result of actions by

other people) or noninterpersonal (i.e., other life-threatening events, such as severe accidents).

Interpersonal trauma exposure generally has been shown to be associated with more severe

posttraumatic stress disorder (PTSD) symptoms than noninterpersonal trauma exposure.

Interpersonal problems also tend to be associated with trauma exposure and PTSD symptoms, but it

is unclear whether a mediating association exists between trauma type, interpersonal problems, and

PTSD symptoms. A clinical sample of 4,275 adolescents (age range: 12–18 years) from the National

Child Traumatic Stress Network Core Data Set were classified as having experienced interpersonal

trauma, noninterpersonal trauma, or both. Interpersonal problems were operationalized by social

problem behaviors (e.g., immature and dependent behaviors) and aggressive behaviors on the Child

Behavior Checklist. The results of path analyses showed that cumulative interpersonal trauma

exposure was both directly and indirectly associated with PTSD symptoms via social problem

behaviors but not aggressive behaviors, total effect $\beta$ = .20, 95% CI [.17, .23]. In a second model,

path analyses showed that cumulative interpersonal trauma exposure was associated directly and

indirectly via PTSD symptoms with social problem behaviors, total effect $\beta$ = .15, 95% CI [.11, .18],

and aggressive behaviors, total effect $\beta$ = .13, 95% CI [.09, .17]. These findings suggest that during

adolescence, interpersonal problems play an important role in the association between interpersonal trauma exposure and PTSD symptoms.

**Interpersonal Trauma Exposure and Interpersonal Problems in Adolescent Posttraumatic Stress Disorder**

Traumatic experiences during childhood have been associated with negative mental health outcomes throughout the lifespan (Dube et al., 2006). Such experiences have been differentiated as interpersonal (i.e., the direct result of actions by other people) and noninterpersonal (i.e., other life-threatening events, such as severe accidents, disasters, or illness; Charak et al., 2018; Dunn et al., 2017; Haldane & Nickerson, 2016; Jaffe et al., 2019; Woodward et al., 2015). The results of previous research suggest that experiencing interpersonal traumatic events may lead to an increased risk of developing posttraumatic stress disorder (PTSD) and complex PTSD (CPTSD; i.e., symptoms of PTSD plus symptoms of emotional, cognitive, and interpersonal difficulties; World Health Organization, 2020) compared to experiencing noninterpersonal traumatic events (Alisic et al., 2014; Brewin et al., 2017; Charuvastra & Cloitre, 2008; Frost et al., 2020; Kerig et al., 2009). In a meta-analysis that aimed to determine the incidence of PTSD in trauma-exposed children and adolescents who were 2–18 years old, Alisic and colleagues (2014) found that approximately one in four youth developed PTSD after experiencing an interpersonal traumatic event, whereas approximately one in 10 youth developed PTSD after experiencing a noninterpersonal traumatic event. Similarly, in a sample of adolescents involved in the juvenile justice system, Kerig and colleagues (2009) found that among both male and female youth, more severe PTSD symptoms were associated with the number of past interpersonal trauma types reported but not associated with noninterpersonal trauma types.

The timing of interpersonal and noninterpersonal trauma exposure may play a role in the differential risk of adverse sequelae of the two types of traumatic experiences. In a study of low-

income, African American adults, Dunn et al. (2017) found that exposure to maltreatment in early childhood, considered to be an interpersonal trauma, was associated with more severe depression and PTSD symptoms than exposure at later developmental periods, after controlling for exposure to noninterpersonal or other types of interpersonal trauma concurrently. Moreover, exposure to other types of interpersonal trauma (e.g., witnessing an attack) in middle childhood was shown to be associated with ratings of depressive symptoms that were twice as high as ratings for the same symptoms in adults who first experienced interpersonal trauma in adulthood, again after controlling for exposure to noninterpersonal trauma (Dunn et al., 2017). These findings support the assertion that exposure to interpersonal trauma in childhood may have a particularly adverse impact on PTSD symptoms.

A potential factor that could play a role in the association between trauma type and PTSD symptoms is interpersonal problems, or problematic interpersonal relationships and difficulties relating to others that create a negative impact on one's ability to form healthy and rewarding relationships, such as being too aggressive or having trouble with affection or sympathy

(Horowitz et al., 1993, 2000). Findings from previous studies suggest that disruptions in social interactions and relationships after traumatic experiences can impact the development of PTSD (Brewin et al., 2000; Hyman et al., 2003; Trickey et al., 2012), possibly through shaping posttraumatic cognitions (Charuvastra & Cloitre, 2008). In a study of adult survivors of intimate partner violence and victims of motor vehicle accidents, social support from family and friends but not from a close other was associated with lower levels of posttraumatic cognitions and PTSD symptoms among participants in both the former interpersonal trauma cohort and the latter noninterpersonal trauma cohort (Woodward et al., 2015). Sperry and Widom (2013) found that a lack of social support explained the association between childhood trauma exposure and anxiety and

depression in adulthood. However, although social support and interpersonal problems may be associated, they are not synonymous, and social support most often has been investigated as a moderator of the association between trauma exposure and PTSD symptoms but not as a potential mediator. In contrast to social support, interpersonal problems that result from or are exacerbated by trauma exposure could be a link between trauma exposure and PTSD symptoms. However, no studies of which we are aware have examined interpersonal problems as a mediator of the association between trauma exposure and PTSD symptoms.

Although findings from previous research provide evidence that interpersonal problems may occur after trauma exposure and before the development of PTSD symptoms, there could also be a bidirectional relation between interpersonal problems and PTSD. For example, in a sample of adolescents who had a history of childhood sexual abuse, higher levels of PTSD symptom severity were associated with poorer social functioning (McLean et al., 2013). Moreover, PTSD has been associated with problems related to trust, closeness, and peer relationships (Beck et al., 2008; McFarlane & Bookless, 2001). Thus, PTSD could also lead to or exacerbate interpersonal problems following trauma exposure.

In addition, to our knowledge, no studies have focused on whether interpersonal problems are differentially associated with exposure to interpersonal versus noninterpersonal trauma. Although there is evidence that the cumulative effect of exposure to multiple types of trauma, including both interpersonal and noninterpersonal traumatic events, is associated with a wide variety of emotional, behavioral, and cognitive problems in childhood (Hebert et al., 2018; Hodges et al., 2013; Solva et al., 2020), there also is evidence that cumulative exposure to interpersonal trauma may have more debilitating effects than cumulative exposure to noninterpersonal trauma (Baker et al., 2020). Given that interpersonal traumatic events are often stigmatizing and can lead to a sense

of betrayal, distrust, and insecurity in relationships (Charuvastra & Cloitre, 2008; Freyd, 1994; Punamaki et al., 2005), exposure to interpersonal trauma may have a greater impact on interpersonal problems than exposure to noninterpersonal trauma. Children who are exposed to multiple types of interpersonal trauma have been described as polyvictims (Finkelhor et al., 2007), and polyvictimization has been shown to be associated with PTSD, depression, and substance abuse symptoms and interpersonal problems among adolescents when compared to less-extensive trauma exposure (Ford, Elhai, et al., 2010).

Examining the association between trauma type, interpersonal problems, and PTSD symptoms in adolescence is important given the relevance of interpersonal relationships during this developmental period. In adolescence, positive relationships with peers can provide a sense of belonging and feelings of closeness, as adolescents become increasingly independent and develop their own identity (Graber et al., 2016). Positive interpersonal relationships in adolescence have been associated with lower depression rates (Lakey & Cronin, 2008) and higher ratings of self-esteem (Cast & Burke, 2002), whereas interpersonal problems in adolescence have been associated with higher levels of stress (Segrin, 2001; Shahar et al., 2004), generalized anxiety disorder (Borkovec et al., 2002; Eng & Heimberg, 2006), and depression (Petty et al., 2004; Vittengl et al., 2003). Thus, interpersonal relationships and experiences may play an important role in mental health outcomes for trauma-exposed adolescents.

The goal of the present study was to address gaps in the research by identifying associations between interpersonal versus noninterpersonal trauma exposure, interpersonal problems, and PTSD symptoms in a clinical sample of trauma-exposed adolescents. We hypothesized that (a) cumulative interpersonal trauma exposure would be associated with PTSD symptoms and with interpersonal problems, (b) interpersonal problems would mediate the association between interpersonal trauma

and PTSD symptoms, and (c) noninterpersonal trauma would not be associated with interpersonal problems. Given the potential bidirectional nature of interpersonal problems and PTSD symptoms, in a separate analysis, we hypothesized that (d) PTSD symptoms would mediate the association between interpersonal trauma and interpersonal problems.

**Method**

**Participants and Procedure**

The present study included a secondary analysis of data collected as part of a large clinical multisite dataset, the National Child Traumatic Stress Network (NCTSN) Core Data Set (CDS). The dataset consists of clinic-referred children 0–21 years of age (*N* = 14,088) with trauma histories who were seen in a variety of treatment settings, including hospitals, community-based clinics, and outpatient and residential treatment settings throughout the United States. Data were collected from 56 NCTSN sites between 2004 and 2010. For the present analysis, we used baseline data collected before individuals started any trauma treatment. The CDS is part of a quality improvement effort by the NCTSN. Additional details on the CDS are reported in previous studies (Briggs et al., 2012; Greeson et al., 2014; Steinberg et al., 2014). Clinicians were licensed providers or provisionally licensed providers operating under the supervision of a licensed provider. All staff members were trained on the assessment measures and CDS data collection protocols. Deidentified data for the present study were obtained and analyzed at the UCLA–Duke University National Center for Child Traumatic Stress (NCCTS). Institutional Review Board (IRB) approval was obtained from the University of Michigan. For the present study, we restricted the sample to a subset of the NCTSN CDS that included adolescents ages 12–18 years who had experienced at least one traumatic event (*N* = 4,275). This age range was chosen because previous research on adolescence has typically encompassed youth who are 12–18 years old (Jaworska & MacQueen, 2015). In addition, the Child Behavior Checklist, a

measure used in the present study, is intended for use in children aged 6–18 years (Achenbach & Rescorla, 2001).

The mean participant was 14.8 years (*SD* = 1.7, range: 12–18). The sample was 60.4% female. The distribution of race/ethnicity backgrounds was 34.7% White/Non-Hispanic, 34.5% Hispanic, 24.7% Black/Non-Hispanic, and 6.1% "other"/Non-Hispanic. In addition, 60.0% of the sample had public insurance.

**Measures**

*Childhood Trauma Exposure*

Childhood trauma exposure was assessed using the CDS General Trauma Information Form. This form was adapted from the trauma exposure section of the UCLA PTSD Reaction Index (RI; Steinberg et al., 2004). Clinicians use the form to report which of 20 different trauma types a child may have experienced based on interviews with the child, caregiver, and collateral individuals (e.g., caseworkers; Briggs et al., 2012). For each trauma type, response options include "yes," "no," "suspected," or "unknown." For the present study, only answers reported as "yes" were analyzed. Trauma exposure types were categorized as interpersonal or noninterpersonal for analyses. Interpersonal traumas included: sexual maltreatment or abuse; sexual assault or rape; physical maltreatment or abuse; physical assault; emotional abuse or psychological maltreatment; neglect; domestic violence; war, terrorism, or political violence inside the United States; war, terrorism, or political violence outside the United States; kidnapping; forced displacement; impaired caregiver; extreme interpersonal violence not reported elsewhere; community violence not reported elsewhere; and school violence not reported elsewhere. This categorization is consistent with previous studies that have compared exposure to interpersonal and noninterpersonal trauma exposure (e.g., Alisic et al., 2014; Kerig et al., 2009; Vibhakar et al., 2019). A summary score was

created to reflect the cumulative number of interpersonal trauma types adolescents experienced

(range: 1–15).

Noninterpersonal traumas included illness or medical trauma, serious injury accident, natural

disaster, and traumatic loss or bereavement. This categorization is consistent with previous studies

that have compared exposure to interpersonal versus noninterpersonal traumatic events (e.g., Alisic

et al., 2014; Kerig et al., 2009; Vibhakar et al., 2019). A summary score was created to reflect the

cumulative number noninterpersonal trauma types adolescents experienced (range: 1–4).

### *Interpersonal Problems*

Interpersonal problems in adolescence include problematic interpersonal behaviors and

interactions with others (e.g., Johnson et al., 2002). The Social Problem Behaviors and Aggressive

Behaviors subscales of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) were used

to operationalize interpersonal problems. On the CBCL, the parent or caregiver who spends the most

time with the child rates items, each of which begins with the stem "For each item that describes

your child now or within the past 6 months…," using response options ranging from 0 (*not true*) to 2

(*very true or often true*). For subscale analyses, a continuous *t* score was used for each scale to

determine clinical significance. Per Achenbach and Rescorla (2001), *t* scores less than 67 are

considered normal, *t* scores of 67–70 are considered borderline clinical, and *t* scores higher than 70

are considered to be in the clinical range. The CBCL has been normed, and several studies have

documented its robust psychometric properties, including validity and reliability (e.g., Achenbach &

Rescorla, 2001; Dang et al., 2017).

The 11-item CBCL Social Problems subscale was used to assess immature, dependent, and socially

incompetent behaviors. Sample subscale items include, "Doesn't get along with other kids,"

"Complains of loneliness," and "Gets teased a lot" (Achenbach & Rescorla, 2001). In the present

sample, *t* scores for the Social Problems subscale ranged from 50 to 91, and Cronbach's alpha was

.88.

Aggressive behaviors (i.e., aggressive behaviors that create problematic and poor relationships) were

measured using the 18-item CBCL Aggressive Behavior subscale. Sample subscale items are, "Argues

a lot," "Disobedient at home," "Cruelty, bullying, or meanness to others" (Achenbach & Rescorla,

2001). In the present sample, *t* scores for the Aggressive Behaviors subscale ranged from 50 to 98,

and Cronbach's alpha was .93.

### *PTSD Symptoms*

The UCLA PTSD Reaction Index (RI; Steinberg et al., 2004) was used to assess PTSD

symptoms based on the criteria in the fourth edition (text rev.) of the *Diagnostic and Statistical*

*Manual of Mental Disorders* (*DSM-IV*; American Psychiatric Association [APA], 2000). For the present

study, 20 PTSD symptom items and two associated feature items (i.e., trauma-related guilt, fear of

trauma recurrence) were used. Responses were collected via clinical interviews and adolescent self-

report. The items correlate with the *DSM-IV* intrusion, avoidance, and arousal criteria while also

assessing fear of recurrence and trauma-related guilt (Steinberg et al., 2004). Response options

range from 0 (*none*) to 4 (*most*). Several studies have demonstrated evidence of the measure's

validity and reliability in children and adolescents (e.g., Steinberg et al., 2004, 2013). For the current

analyses, PTSD symptoms were treated as a continuous variable, with higher scores indicating higher

levels of PTSD symptom severity. Youth frequently do not meet the criteria for a full PTSD diagnosis

but still have severe symptoms that can interfere with functioning (Newman, 2002). Thus, research

on adolescent PTSD is best served by continuous ratings of PTSD symptoms rather than diagnostic

status alone (Kerig et al., 2009). In the present sample, Cronbach's alpha was .95.

### *Demographic Characteristics*

Sociodemographic characteristics used as control variables included race and ethnicity (Black/Non-Hispanic, White/Non-Hispanic, "other"/Non-Hispanic, and Hispanic), gender (male, female, other, unknown), and public insurance status (yes, no).

**Data Analysis**

First, descriptive statistics and bivariate correlations among all study variables were examined using SAS (Version 9.4; SAS Institute Inc., 2015). For each model, the inclusion of sociodemographic characteristics was determined based on theory and support from previous studies (e.g., Greeson et al., 2014; Jones, 2007; Mercado-Crespo & Mbah, 2013; Valois et al., 2002; Winer & Thompson, 2013). Given the limitations of the cross-sectional data and an inability to determine whether the interpersonal problems occurred before PTSD symptom onset, path analyses were used to test two models representing the hypothesized associations. The first model tested the role of interpersonal problems as a mediator between trauma type and PTSD symptoms. The second model was used to examine PTSD symptoms as a mediator between trauma type and interpersonal problems. Path analyses were completed in *Mplus* (Version 8.0; Muthén & Muthén, 2017). Both models were estimated using full information maximum likelihood estimation with 500 bootstrap samples to provide conservative estimates of 95% confidence intervals that were robust to nonnormality. The reported results were obtained from bias-corrected bootstrapped models. Standardized 95% confidence intervals were evaluated to determine the significance of path coefficients; confidence intervals that did not include 0 were considered statistically significant. Total and specific indirect associations were also evaluated using the same criteria.

Model fit was evaluated using the root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis Index (TLI), and standardized root mean square residual (SRMR). For the RMSEA, values less than .06 were used to indicate good model fit. For the CFI and

TLI, values above .95 were used to indicate good model fit. For the SRMR, values less than .08 were used to indicate good model fit (Hu & Bentler, 1999; West et al., 2012). Data were missing in low proportions (less than 10%). Of the full sample, 346 participants were removed due to missingness on the predictor variables (*n* = 119) or missingness on all outcome variables (*n* = 227). No other patterns of missingness were observed.

**Results**

**Descriptive Statistics**

Descriptive statistics and correlations are depicted in Table 1. Participants experienced a mean of 3.15 (*SD* = 2.31) types of interpersonal traumatic events and 0.90 (*SD* = 0.82) noninterpersonal traumatic events. Female participants had significantly higher levels of PTSD symptoms than their male counterparts, βs = .21–.22. Youth who were Black, β = -.08; Hispanic, βs = -.05–.06; or reported their race/ethnicity as "other" βs = -.04–.05, had fewer social problem behaviors than youth who were White/Non-Hispanic. Youth who reported public insurance had higher levels of social problem behaviors, βs = .04–.05, than those who did not. Female youth had lower rates of aggressive behaviors, βs = -.05–.07, than male youth. Participants who were Hispanic had lower rates of aggressive behaviors, β = -.06, than youth who were White/Non-Hispanic.

**Model 1**

The first path model fit the data well, RMSEA = .011, CFI = .999, TLI = .995, SRMR = .007 (see Figure 1 and Supplementary Table S1). Social problem behaviors and aggressive behaviors were significantly correlated with each other in the model, *r* = .61, *p* < .001. Cumulative interpersonal trauma exposure was associated with more severe social problem behaviors, aggressive behaviors, and PTSD symptoms, βs = .13–.17, *p* < .001. Social problem behavior severity was associated with higher levels

of PTSD symptoms, β = .16, *p* < .001. Exposure to interpersonal trauma was directly associated with PTSD symptoms, β = .17, *p* < .001, and indirectly associated with PTSD symptoms through social problem behaviors (i.e., partial mediation), β = .02, *p* < .001. Cumulative noninterpersonal trauma exposure was associated with more severe PTSD symptoms, β = .03, *p* = .045. There were no associations between cumulative noninterpersonal trauma exposure and social problem behaviors or aggressive behaviors. The model explained 19% of the variance in PTSD symptom severity.

**Model 2**

The second model also fit the data well, RMSEA = .006, CFI = 1.0, TLI = .998, SRMR = .006 (see Figure 2 and Supplementary Table S2). Social problem behaviors and aggressive behaviors were significantly correlated with each other in the model, *r* = .61; *p* < .001. Cumulative interpersonal trauma exposure was associated with more severe PTSD symptoms, aggression, and social problem behaviors, β = .11–.20, *p* < .001. More severe PTSD symptoms were associated with increased aggression and social problem behaviors, βs = .12 and .18, *p* < .001, respectively. Interpersonal trauma exposure was directly associated with social problem behaviors, β, = .11, *p* < .001, and aggressive behaviors, β = .11, *p* < .001, and indirectly associated (i.e., partial mediation) with social problem behaviors, β = .04, *p* < .001, and aggressive behaviors, β = .02, *p* < .001, via PTSD symptoms. Cumulative noninterpersonal trauma exposure was associated with more severe PTSD symptoms, β = .03, *p* = .034, as well as with social problem behaviors indirectly via PTSD symptoms, β = .01, *p* = .039. The model explained 21% of the variance in interpersonal problems.

**Discussion**

The present findings support the hypothesis that cumulative interpersonal trauma exposure (i.e., polyvictimization) is associated with adolescent PTSD symptoms and interpersonal problems and that these variables also are partial mediators when the other variable is modeled as an outcome.

These findings are consistent with previous research that has shown an association between exposure to interpersonal trauma, interpersonal problems, and PTSD (McLean et al., 2013; Beck et al., 2008) and that disruptions in social interactions can impact the development of PTSD (Brewin et al., 2000; Hyman et al., 2003; Trickey et al., 2012). However, this was the first study to our knowledge that examined the role of interpersonal problems as a mediator between the type of trauma exposure and PTSD symptoms as well as PTSD symptoms as a mediator between trauma type and interpersonal problems. Interpersonal trauma exposure may involve psychological factors that can make it difficult for an individual to engage in positive social interactions, such as feelings of betrayal (Freyd, 1994), a sense of distrust and stigma (Punamaki et al., 2005), and associated maladaptive cognitions, such as self-blame, feelings of incompetence, and beliefs that the world is dangerous (Alisic et al., 2014; Tolin & Foa, 2006). Such psychological effects of interpersonal trauma warrant investigation as potential contributors in the pathways that were identified in the current study.

Although the present findings showed that exposure to interpersonal trauma was associated with interpersonal problems and PTSD symptoms in both models, it is important to note that when PTSD symptoms were tested as a mediator, noninterpersonal trauma exposure was associated indirectly with social problem behaviors through PTSD symptoms. Although noninterpersonal trauma exposure has been shown to be associated with a lower risk of adverse outcomes than exposure to interpersonal trauma (Alisic et al., 2014; Musicaro et al., 2020; Vibhakar et al., 2019), children who experience noninterpersonal traumatic events are at risk for multiple adverse outcomes, including full and partial PTSD and CPTSD symptoms (Elliott et al., 2021). These symptoms, in turn, can affect their interpersonal (Bolton et al., 2004), cognitive (Malarbi et al., 2020), behavioral (Price et al., 2013), and affective functioning (Briggs-Gowan et al., 2010).

We examined two models in an attempt to obtain a more nuanced understanding of the association between trauma exposure, interpersonal problems, and PTSD symptoms. Both models fit the data well and explained similar levels of variance. Due to the cross-sectional nature of the present study, it is not possible to draw definitive conclusions about the directionality of some of the results. Specifically, the association between PTSD symptoms and interpersonal problems could be bidirectional. Future research using longitudinal data would help to better describe these relations.

The first model examined the association between trauma type and interpersonal problems, with PTSD symptoms as a mediator. In the first model, aggressive behaviors did not explain significant variance in PTSD symptoms after accounting for the association between social problem behaviors with PTSD symptoms. Aggression is often associated with poor peer relationships (Card et al., 2008; Laible et al., 2000; Leary et al., 2006) and PTSD (Marsee, 2008; Silvern & Griese, 2012), but these studies did not account for social problem behaviors. In this model, social problem behaviors partially mediated the association between interpersonal trauma exposure and PTSD symptoms. Thus, social problem behaviors may be a more robust risk factor for PTSD symptoms than aggressive behaviors.

The second model examined the alternative possibility that PTSD symptoms might mediate the relation between interpersonal trauma exposure and interpersonal problems. The results indicated that PTSD symptoms mediated the association between interpersonal trauma exposure and both social problem behaviors and aggressive behaviors. The two models indicate that there is an association between interpersonal problems and PTSD symptoms (e.g., avoidance, social detachment, hyperarousal) after exposure to interpersonal trauma, although the directionality of these associations is still uncertain. It is possible that interpersonal problems lead to PTSD symptoms, interpersonal problems result from PTSD symptoms (e.g., reactive aggression; Ford,

Fraleigh, et al., 2010; Hecker et al., 2015), or both adverse outcomes may occur concurrently but be independent of each other. Prospective studies are needed to determine which of the potential mediation pathways identified in the present study best describe the associations among interpersonal trauma exposure, interpersonal problems, and PTSD symptoms as well as other posttraumatic outcomes.

It is important to note that the models controlled for significant sociodemographic differences. Female youth had significantly higher levels of PTSD symptoms than male youth, which is consistent with previous findings in children and adolescents (Alisic et al., 2014). Adolescent girls tend to report more close friends and more intimacy among friends than adolescent boys (Hall, 2011); thus, a disruption in positive peer relationships could impact female adolescents more than their male counterparts. Youth on public insurance had higher levels of social problem behaviors, which could be related to the high levels of mistrust that can occur in disadvantaged neighborhoods (Ross et al., 2001). Youth on public insurance also had higher levels of aggressive behaviors. Previous researchers have indicated that poverty predicts violence, possibly due to feelings of frustration and injustice (Valois et al., 2002). Youth who were Black, Hispanic, or reported "other" as their race/ethnicity had fewer social problem behaviors compared to non-Hispanic/White youth, and youth who were Hispanic had lower aggressive behaviors compared to non-Hispanic/White youth, which is similar to previous findings from this dataset (Greeson et al., 2014). Future research is needed to examine what role, if any, these sociodemographic differences play in the association between exposure to interpersonal trauma, interpersonal problems, and PTSD.

Several limitations should be noted. Although this study utilized validated measures with a large sample of youth, the data were cross-sectional, so causal relations cannot be inferred. Additional details about the nature and complexity of traumatic experiences, interpersonal

problems, and PTSD symptoms were not available for this study but could serve as the basis for future research in this area. Similarly, the extent of the youths' interpersonal problems before trauma exposure was unknown, so it was not possible to determine the impact of preexisting problems. Although the data were collected before youth started trauma treatment, youth could have had other mental health treatments previously that impacted the baseline data. Symptoms of PTSD were assessed based on the *DSM-IV* rather than *DSM-5* criteria, so the current *DSM-5* category of negative alterations in cognitions and mood was not fully captured in this study (APA, 2013). Assessments of social problems and aggression were based on parent report and did not specify key distinctions, such as peer versus family problems and reactive versus proactive aggression. Finally, the sample comprised treatment-seeking youth; therefore, the results are only generalizable to that population.

Preliminary clinical implications include the importance of assessing social problem behaviors with youth exposed to interpersonal trauma, particularly those exposed to several types of interpersonal traumatic events (i.e., polyvictims; Finkelhor et al., 2007). Teaching and practicing communication skills as well as facilitating prosocial connections with peers could be important in PTSD treatment for interpersonal trauma–exposed youth to not only mobilize positive social support but also to reduce interpersonal problems (e.g., Ford et al., 2012).

In conclusion, the present study was the first to our knowledge that demonstrated partial mediation by social problem behaviors in the association between interpersonal trauma exposure and PTSD symptoms as well as partial mediation by PTSD symptoms in the association between interpersonal trauma exposure and interpersonal problems. Interpersonal relationships become more diverse and potentially problematic as children enter adolescence. Positive relationships can provide a sense of belonging and feelings of closeness, whereas negative relationships are associated with mental

health problems and high levels of stress (Eng & Heimberg, 2006; Graber et al., 2016; Segrin, 2001; Shahar et al., 2004). Therefore, interpersonal trauma exposure and interpersonal problems are a particularly relevant focus for research and treatment with adolescents who have experienced trauma.

**Open Practices Statement**

The secondary analysis study reported in this article was not formally preregistered. Neither the data nor the materials have been made available on a permanent third-party archive.

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INTERPERSONAL PROBLEMS IN ADOLESCENT PTSD

*...tive Statistics and Correlation Table for Variables*

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *M* | *SD* | Skewness | Kurtosis | Fre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ...D symptoms | .13* | .20* | .24* | .07* | .24* | -.02 | -.01 | .01 | .00 | 25.92 | 15.03 | .31 | -.69 | |
| ...essive r | - | .62* | .13* | .03 | -.03 | .00 | -.05* | .01 | .06* | 63.50 | 10.99 | .77 | .07 | |
| ...l problems | | - | .17* | .06* | .03 | -.07* | -.01 | -.01 | .06* | 61.56 | 9.15 | .58 | -.15 | |
| ...personal | | | - | .18* | .14* | -.09* | -.05 | .07* | .16* | 3.15 | 2.31 | .83 | .37 | |
| ...nterpersonal | | | | - | -.01 | -.03 | .01 | .04* | .08* | 0.90 | 0.82 | .82 | .54 | |
| ...le[a] | | | | | - | -.01 | -.03 | .02 | .01 | - | - | - | - | 6 |
| ...[a] | | | | | | - | -.40* | -.14* | .08* | - | - | - | - | 2 |
| ...nic[a] | | | | | | | - | -.18* | -.03 | - | - | - | - | 3 |
| ...er" race | | | | | | | | - | .00 | - | - | - | - | 6 |

*Note. N* = 4,275. Mean values and standard deviations are reported for continuous variables;

frequencies are reported for categorical variables. PTSD = posttraumatic stress disorder.
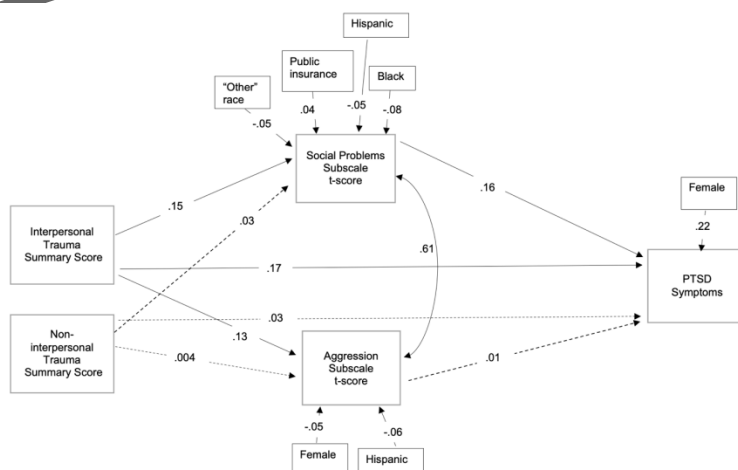
[a]White race, non-Hispanic ethnicity, and male gender were reference groups.

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

**Figure 1**

*Model 1: Trauma Exposure, Interpersonal Problems, and Posttraumatic Stress Disorder (PTSD)*

*Symptoms as an Outcome Variable*



*Note.* Standardized parameter estimates (i.e., beta values) are included. Solid lines represent

significant direct pathways; dotted lines represent nonsignificant pathways. Only covariates

INTERPERSONAL PROBLEMS IN ADOLESCENT PTSD

significant at the *p* < .05 level are included in the figure. White race, Non-Hispanic ethnicity, and

male gender were used as the reference groups. RMSEA = .011, CFI = .999, TLI = .995, SRMR = .007.

**Figure 2**

*Model 2: Trauma Exposure, Interpersonal Problems, and Posttraumatic Stress Disorder (PTSD)*

*Symptoms as a Mediating Variable*

*Note.* Standardized parameter estimates (i.e., beta values) are included. Solid lines represent

significant direct pathways; dotted lines represent nonsignificant pathways. Only covariates

significant at the *p* < .05 level are included in the figure. White race, Non-Hispanic ethnicity, and

male gender were used as the reference groups. RMSEA = .006; CFI = 1.0; TLI = .998; SRMR = .006.