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Abstract

Adolescents exposed to violence are at elevated risk of developing most forms of psychopathology, including depression, anxiety, and alcohol abuse. Prior research has identified emotional reactivity and difficulties with emotion regulation as core mechanisms linking violence exposure with psychopathology. Scant research has examined behavioral responses to distress as a mechanism in this association. This study examined the association of violence exposure with distress tolerance—the ability to persist in the face of distress—and whether lower distress tolerance linked violence exposure with subsequent increases in depression, anxiety, and alcohol abuse problems during adolescence. Data were collected prospectively in a sample of 287 adolescents aged 16–17 (44.3% male; 40.8% White). At Time 1, participants provided self-report of demographics, violence exposure, and psychopathology, and completed a behavioral measure of distress tolerance, the Paced Auditory Serial Addition Task. Four months later, participants (n = 237) repeated the psychopathology assessments. Violence exposure was associated with lower distress tolerance (β = −.21 *p* = .009), and elevated concurrent psychopathology (β = .16–.45, *p* = .001–.004). Low distress tolerance was prospectively associated with greater likelihood of abusing alcohol over time (OR = .63, *p* = .021), and mediated the association between violence exposure and greater levels (β = .02, 95% CI [.001, .063]) and likelihood (OR = .03, 95% CI [.006, .065]) of alcohol use over time. In contrast, low distress tolerance was not associated concurrently or prospectively with internalizing symptoms. Results persisted after controlling for socio-economic status. Findings suggest that distress tolerance is shaped by early experiences of

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threat and plays a role in the association between violence exposure and development of problematic alcohol use in adolescence.

Keywords

Violence; Adversity; Distress tolerance; Alcohol; Internalizing; Adolescence

Exposure to interpersonal violence is common in children and adolescents, with some estimates suggesting that nearly half of U.S. adolescents have directly witnessed or been the victim of violent assault in their lifetimes (Finkelhor et al., 2013). These rates are concerning because exposure to interpersonal violence in childhood is a potent risk factor for many commonly occurring mental health problems, including depression, anxiety, and alcohol abuse (Kessler et al., 2005; Keyes et al., 2012; Klitzman & Freudenberg, 2003; McLaughlin et al., 2012; Molnar et al., 2001; Ward et al., 2001). Disruptions in emotional processing and emotion regulation have frequently been posited to be a key mechanism underlying the association between violence exposure and psychopathology (McLaughlin, 2016; McLaughlin & Lambert, 2017). Here, we examine whether reductions in distress tolerance —the ability to persist in the face of emotional distress or frustration (Daughters et al., 2009)-explains the association between violence exposure and symptoms of alcohol abuse, depression, and anxiety in adolescence.

Adverse childhood experiences, defined as circumstances that deviate from the expectable environment and that require significant psychological, social, or neuro-biological adaptation, are associated with increased risk for virtually all forms of psychopathology (McLaughlin, 2016). Recent conceptual models suggest the need to distinguish between experiences of threat that involve harm or threat of harm (i.e., exposure to violence, physical abuse) and experiences of deprivation that involve an absence of expected social and cognitive inputs from the environment (i.e., neglect, institutional rearing) when studying their downstream consequences on developmental outcomes (McLaughlin & Sheridan, 2016; McLaughlin et al., 2014). Here, we focus on environmental experiences that share the common feature of being a potential threat to the child's safety, including physical abuse, sexual abuse, and violence exposure in the community.

Experiences of threat are likely to have strong influences on emotional processing across development, leading to lasting changes in emotional reactivity and the ability to modulate responses to negative emotion. Specifically, evidence from behavioral and neuroimaging studies suggest that childhood violence exposure is associated with increased emotional reactivity as measured by self-report both concurrently (Heleniak et al., 2017) and longitudinally (Heleniak et al., 2015), and in neuroimaging measures of amygdala response to negative emotional stimuli (McCrory et al., 2011, 2013; McLaughlin et al., 2015). Heightened emotional responses to potential threats likely represent a positive adaptation to living in a dangerous environment, as they facilitate early identification of threat and may promote safety-seeking behavior. In addition to heightened emotional reactivity, children who have experienced violence also experience difficulty modulating emotional reactions and disengaging from negative stimuli. This has been demonstrated for multiple forms of

emotion regulation, including engagement in rumination—a strategy that is strongly linked to persistent distress and risk for psychopathology (Nolen-Hoeksema et al., 2008), adaptation to emotional conflict—an implicit form of emotion regulation that has been consistently linked to risk for psychopathology (Etkin & Schatzberg, 2011; Etkin et al., 2006; Gyurak et al., 2011), and cognitive reappraisal—an explicit or effortful form of emotion regulation with strong associations with psychopathology (Ochsner & Gross, 2005). Children with histories of exposure to violence demonstrate higher levels of rumination (Heleniak et al., 2015, 2017), difficulty adapting to emotional conflict (Lambert et al., 2017; Marusak et al., 2015), and exhibit greater recruitment of the prefrontal cortex (PFC) during cognitive reappraisal, suggesting that the process is more effortful or difficult for them (McLaughlin et al., 2015). Finally, children exposed to violence exhibit reduced resting-state functional connectivity between the amygdala and medial PFC (Herringa et al., 2013; Marusak et al., 2015; Thomason et al., 2015), a circuit with a known role in multiple forms of emotion regulation.

A second area of research has focused on elucidating on how violence disrupts the processing of social information and shapes normative beliefs in ways that increase risk specifically for antisocial behavior. Physically abused children are more likely to overidentify anger in others using less perceptual information (Pollak & Sinha, 2002), and to interpret socially ambiguous contexts as hostile (Dodge et al., 1990). When deciding how to react to perceived social threat, these children generate a smaller range of potential responses, select responses that are more aggressive, and foresee fewer negative consequences to responses that are antisocial (Guerra & Slaby, 1990; Perry et al., 1986). This pattern of cognitive biases has been widely studied as a mechanism linking violence with the development of aggressive behavior (Guerra & Huesmann, 2004; Haegerich & Tolan, 2008). Yet relatively little is known about how violence may shape more subtle behavioral responses to everyday stressors and frustrations. Heightened emotional reactivity, difficulty regulating negative emotions, and cognitive biases may make it more difficult for children exposed to violence to persist during difficult and frustrating tasks. We are unaware of prior research examining whether violence exposure influences distress tolerance in children and adolescents. The vast majority of research on distress tolerance has conceptualized it as trait-like (for reviews, see (Leyro et al., 2010) and (Zvolensky et al., 2010)). However, initial evidence from adult studies suggest that a history of violence exposure is associated with lower distress tolerance (Gratz et al., 2007; Vujanovic et al., 2011). Furthermore, Bernstein and colleagues (2008) found that a stress induction decreased the ability of adults to withstand distress while persisting in goal-related behavior. These studies highlight the plausible role that environmental factors play in the development of distress tolerance, particularly experiences of threat-related adversity.

Numerous cross-sectional studies have identified low distress tolerance as a vulnerability factor for substance use problems among adults (Buckner et al., 2007; Gorka et al., 2012; Marshall-Berenz et al., 2011; Simons & Gaher, 2005), and among adolescents (Daughters et al., 2009; MacPherson et al., 2010). Individuals who are prone to escaping rather than persisting through challenging negative emotional and physical states may be particularly vulnerable for the immediate physiological relief provided by alcohol and other substances (King et al., 2018a, 2018b). Although there has long been a focus on identifying

internalizing predictors of adolescent substance use (e.g., Hussong et al., 2011), remarkably few studies have examined distress tolerance as a prospective predictor of the onset of substance use problems. It is surprising that this association has yet to be examined prospectively during the developmental period when most individuals initiate use (Johnston et al., 2016). For adolescents with low distress tolerance, relying on alcohol may be a particularly attractive method for avoiding the discomfort generated by the interpersonal stressors that occur more frequently during adolescence and are more likely to trigger negative affect than in prior developmental periods (Larson & Ham, 1992; Larson & Lampman-Petraitis, 1989; Rudolph & Hammen, 1999). Of course, a variety of other risk factors for adolescent alcohol abuse have been identified, including environmental factors such as parenting (e.g. low monitoring, high permission), peer and sibling drinking, and sociodemographic factors including race/ethnicity, religion, and gender (Barnes et al., 2005; Donovan, 2004; Hopfer et al., 2003). Parental alcohol use has gained attention as a predictor of adolescent problem drinking because it can serve as both a genetic marker of risk for alcohol problems, as well as provide a social learning model for the child (Lee et al., 2014). Another prominent pathway to alcohol problems in adolescence has been positive alcohol expectancies and motives for drinking (McBride et al., 2014; Patrick et al., 2010). Yet, the risks associated with distress tolerance and other impulsivity-related behaviors (Stautz et al., 2013) are poorly understood in adolescents. We focus here on this relatively understudied pathway that may be uniquely important in that distress tolerance may continue to confer risk for alcohol problems into adulthood and presents a clear target for intervention, unlike many environmental and sociodemographic risk factors (e.g., poverty, parental alcohol use).

While existing evidence indicates that low distress tolerance is a risk factor for substance use problems, relatively few studies have examined whether low distress tolerance may be better characterized as a transdiagnostic risk factor underlying the onset and maintenance of a wider range of mental health problems, including anxiety and depression. Yet theoretical support from the field of personality research has converged around the related idea that a tendency for impulsive avoidance places individuals at risk for psychopathology of many kinds (Barlow et al., 2014; Cyders & Smith, 2008; Johnson et al., 2013). Indeed, low distress tolerance has been associated with anxiety symptoms and disorders in cross-sectional studies (Boelen & Reijntjes, 2009; Bonn-Miller et al., 2009; Buckner et al., 2007; Daughters et al., 2009). However, both low distress tolerance and anxiety disorders are characterized by greater attention and sensitivity to negative arousal and behavioral avoidance of distressing contexts. It is therefore possible that low distress tolerance does not precede anxiety symptoms but simply reflects their presence. Similarly, it is difficult to disentangle the relation between low distress tolerance and depression. It is possible that the low persistence in the face of negative emotions may lead to social withdrawal and hopelessness, key features of depression. Yet it is also possible the perseverative focus on negative emotional information and difficulty persisting in goal-directed behavior observed in depression (Joormann & Gotlib, 2010; Nolen-Hoeksema et al., 2008) may lead people to perform poorly on tasks of distress tolerance. A large body of research has examined a variety of factors that predict adolescent depression, including negative peer and school experiences (Lu, 2019; Reinherz et al., 2000), parenting factors like family conflict (Rueter et al., 1999), and parental depression (Beardslee et al., 1998; Jellinek & Snyder, 1998), and cognitive

factors like self-criticism, rumination and a negative attributional style (Abramson et al., 1989; Auerbach et al., 2014; Beck et al., 1983; Nolen-Hoeksema, 2000). However, we are aware of only one study that has examined the role of distress tolerance predicting growth in anxiety and depression symptoms longitudinally across late childhood/early adolescence. Cummings and colleagues (2013) found that distress tolerance, though associated with internalizing problems concurrently, did not predict growth in these symptoms across four years. This study provides initial evidence that low distress tolerance may be a consequence rather than risk factor for internalizing problems. Yet it is clear that more research is needed to understand whether low distress tolerance heightens vulnerability for the onset of anxiety and depression symptoms, particularly during adolescence when these problems most commonly emerge.

The present study addresses these gaps in the literature by examining distress tolerance as a potential mechanism linking exposure to interpersonal violence in childhood with symptoms of alcohol abuse, anxiety, and depression in a diverse, community-based sample of adolescents. First, we examined whether exposure to interpersonal violence was associated with distress tolerance. We examined distress tolerance using a behavioral task rather than questionnaire measure as self-report relies heavily on subject self-awareness, is less ecologically valid, and evidence suggests that self-report measures of distress tolerance are not correlated with actual distress tolerance behavior (McHugh et al., 2013). Second, we evaluated whether low distress tolerance was associated with adolescent psychopathology— including symptoms of alcohol abuse, depression, and anxiety—both concurrently and prospectively over a four-month period. Third, we examined whether low distress tolerance mediated the association between interpersonal violence exposure and increases in symptoms of psychopathology. We expected that greater exposure to interpersonal violence would be associated with decreased tolerance for distress. We additionally predicted that lower levels of distress tolerance would be associated with problematic alcohol use and higher anxiety and depression symptoms both concurrently and prospectively, and would mediate the association between interpersonal violence exposure and later psychopathology. Finally, we expected that the associations of interpersonal violence with psychopathology and distress tolerance would persist after controlling for socio-economic status (SES), specifically poverty and maternal education.

Method

This is the sixth paper from a large multi-site study on mechanisms linking childhood adversity with psychopathology. Other papers from this data set examine associations of adversity with automatic and effortful regulation and psychopathology (Adrian et al., 2019; Heleniak et al., 2017; King, Feil, et al., 2018a, 2018b; King, McLaughlin, et al., 2018a, 2018b; Lambert et al., 2017). This is the first paper using this dataset to examine distress tolerance in relation to either violence exposure or alcohol use problems. This study was conceived and executed (2011–2014) before the current practice of publishing a study protocol or registering an analysis plan was established.

Sample

Participants were drawn from a study of 287 adolescents aged 16 –17 years, recruited in 3 major metropolitan areas in the U.S. (Seattle, Boston, and Pittsburgh). Recruitment was focused in community centers and after-school programs, including in low SES areas to ensure sample variation on the basis of race and ethnicity, SES, and exposure to adversity. Additionally, community mental health and education organizations that provided services for trauma-exposed youth were targeted. The final study sample included 287 adolescents (54.4% female) and their parents. The sample was racially and ethnically diverse (40.8% White; 20.6% Black; 16.0% Asian; 6.3% Hispanic; and 14.6% Biracial or other). Parental informed consent and youth assent were required for participation.

Measures

Violence Exposure

Participants completed the Childhood Trauma Questionnaire (CTQ;Bernstein et al., 1994, 1997, 2003), which assesses frequency of exposure to abuse and neglect during childhood and adolescence. Evidence to support the validity of the CTQ as a retrospective measure of child abuse was provided by Bernstein and colleagues (1994, 1997) by showing good internal consistency ($\alpha = 0.79$–0.94), test–retest reliability over a two to six month period ($ICC = 0.88$), as well as discriminant validity when compared with therapist ratings in an inpatient adolescent psychiatric setting (i.e. $r = 0.46$–0.72, $p < 0.0001$). To assess violence exposure, scores on 15 items in the physical, emotional, and sexual abuse subscales were summed to produce a total child abuse score, with higher scores indicating greater exposure. These items demonstrated good reliability in this sample ($\alpha = 0.88$). Approximately 25.1% of the sample met criteria for exposure to child abuse based on a previously validated cut-off (Walker, & et al, 1999). The Screen for Adolescent Violence Exposure (SAVE; Hastings & Kelley, 1997) is a 32-item measure which assesses frequency of direct and indirect exposure to violence in school, home, and neighborhood settings. Respondents rate the frequency of exposure to indirect community violence (e.g., "I have seen someone get beat up"), traumatic community violence (e.g., "Someone has pulled a knife on me") and physical/ verbal abuse (e.g., "Grownups hit me") on a five-point Likert scale. In their development and validation study of the SAVE, Hastings and Kelley (1997) found that the SAVE demonstrated good validity in detecting violence exposure; it correctly classified 79.37% −82.56% of high and low-violence groups and significant correlations with neighborhood crime data ($r = 0.28$–0.35, $p < 0.001$), and had good internal consistency ($\alpha = 0.65$–0.95). The 12 items from the traumatic community violence scale were summed to produce a direct community violence exposure score. The traumatic community violence scale of the SAVE demonstrated good reliability in this sample ($\alpha = 0.87$).

Child abuse and community violence each represent experiences of threat that are hypothesized to influence emotional processing in similar ways (McLaughlin et al., 2014). We therefore calculated a continuous total violence exposure score for each participant by first standardizing the total CTQ child abuse score and the SAVE traumatic community violence score, and then summing these two standardized scores to create a composite

measure. A similar approach has been used in prior work with this sample (Lambert et al., 2017).

Psychopathology

We used three measures to assess problematic alcohol use and abuse, anxiety, and depression. The Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) is a 10-item self-report measure of problematic alcohol use. Respondents answer questions regarding past-year frequency of alcohol consumption (e.g. "How often do you have six or more drinks on one occasion?"), problematic drinking behavior (e.g. "How often during the last year have you found that you were not able to stop drinking once you had started?"), and adverse psychological reactions (e.g. "How often during the last year have you had a feeling of guilt or remorse after drinking?") on a Likert scale from never (0) to 4 or more times a week (4) as well as questions regarding whether there have been alcohol-related injuries (e.g., "Have you or someone else been injured as a result of your drinking?"). These 10 items were used to calculate a total mean AUDIT score. As is typical in substance use measurement, the total scores on the AUDIT were not normally distributed (Maisto et al., 2000). We addressed this by examining problem drinking in two ways in all analyses examining alcohol use. To examine problem drinking continuously, we log-transformed the total mean AUDIT score for each individual subject. We additionally created a binary AUDIT variable in order to compare participants who did and did not engage in any problem drinking behavior. Evidence to support the validity of the AUDIT in the detection of harmful drinking was provided by Bohn and colleagues (1995) by showing its significant correlation (i.e., $r = 0.54–0.88$, $p < 0.01$) with the MAST and MacAndrew alcoholism screening tests in a sample of known alcoholics and general medical patients. The AUDIT demonstrated good reliability in this sample ($\alpha = 0.81$).

The Children's Depression Inventory (CDI; Kovacs, 1992) is a widely used self-report measure of depression within youth aged 7 to 17. The CDI includes 27 items consisting of three statements (e.g., "Nothing will ever work out for me", "I am not sure if things will work out for me", "Things will work out for me OK") representing different levels of severity of a specific symptom of depression. The item pertaining to suicidal ideation was removed. The 26 remaining items were summed for a total score. In a large community sample, Smucker et al. (1986) demonstrated that the CDI has good internal consistency (i.e. $\alpha = 0.84–0.89$), and in their sample of pediatric hospital patients, Allgaier and colleagues (2012) demonstrated that the CDI had both good sensitivity (83.3%) and specificity (82.7%). The CDI demonstrated good reliability in this sample ($\alpha = 0.86$).

The Multidimensional Anxiety Scale for Children (MASC; March et al., 1997) is a 39-item measure of child anxiety. The MASC assesses physical symptoms of anxiety (e.g., "I'm jumpy"), harm avoidance (e.g., "I keep my eyes open for danger"), social anxiety (e.g., "I worry about getting called on in class"), and separation anxiety (e.g., "I get scared when my parents go away") and is appropriate for youth ages 8 to 19 years. Respondents indicate how often they experience each item using a 4-point Likert scale ranging from never true (0) to very true (3). The MASC total score was calculated as the mean response across all 39 items. In two separate school-based population studies conducted by March and colleagues

(1997), the MASC demonstrated good test–retest reliability (i.e. ICC = 0.79–0.93) and evidence to support the validity of the MASC in the detection of child anxiety was demonstrated by showing its significant correlation (i.e., r = 0.62 p < 0.01) with the RCMAS. The MASC demonstrated high reliability in this sample (α = 0.89).

Poverty

A parent or guardian provided information regarding their current annual household income. The income-to-needs ratio was calculated by dividing total household income by the 2012 U.S. census-defined poverty line for a family of their individual size (based on the year data were collected). A lower value than one indicated a family was living below the poverty line. This ratio was used to create a dichotomous poverty variable, such that families were grouped into those who were and were not living in poverty. Parent-reported SES data were available on a smaller proportion of the sample (n = 147).

Maternal Education

A parent or guardian provided information regarding highest level of education achieved by the participant's mother. Response options were rated on a 10-point scale from "8th grade or less" (1) to "graduate/professional school" (10). Maternal education was normally distributed in the study sample, with approximately 25% of mothers reporting a high school education or less.

Behavioral Task

Distress Tolerance

To assess distress tolerance, we used the Paced Auditory Serial Addition Task (PASAT), a performance-based computer task that is designed to measure attentional and behavioral persistence on a difficult task that creates frustration and emotional distress (Daughters et al., 2005; Lejuez et al., 2003). Participants view a series of numbers sequentially flashed on a computer screen, and are instructed to add each new number to the previously presented number (not the running total) before the subsequent number appears on the screen. The task consists of three blocks. The first block lasted 3 min, the second block lasted 5 min, and the third block lasted 7 min. In block 1, the latency between stimuli was three seconds (60 trials), in block 2, two seconds (72 trials), and in block three, latency was one second (92 trials). Shorter latencies between stimuli increase the difficulty of the task on each subsequent block. Participants were told that they could terminate the task at any time once they reached the final block of the task. Participants were unaware of the task length. Distress tolerance was measured continuously as the latency (in seconds) to termination in the third block of the task, consistent with prior research (Daughters et al., 2005; Lejuez et al., 2003). A binary distress tolerance variable was also created to compare participants who did and did not elect to quit the task.

Procedure

Participants were recruited, consented and assented to complete a battery of task and psychological assessments. At Time 1 (T1), participants provided demographic information

and completed measures of violence exposure and psychopathology. Each participant also completed the PASAT and time-to-quit was recorded. At each of the sites, adolescents completed the PASAT in a small assessment room with the experimenter. The PASAT was programmed in E-prime to ensure that the administration was identical for all participants. The experimenter used a scoring sheet that displayed the correct answer for each trial and scored the task as the participant completed it. The task was also audio-recorded to allow for scoring to be checked if the experimenter missed a trial or was unsure about a particular response. This procedure ensured that there were no site variations in task administration, and indeed no significant effect of site was observed on task performance for the three site locations ($F(2, 281) = 0.16$, $p = 0.852$).

At Time 2 (T2), four months following T1 (M = 120.28 days), participants (n = 237) repeated the psychopathology assessments in an online format. We selected this period of time to reduce attrition as much as possible. Furthermore, as almost half of our sample were high school seniors at T1, it was important to conduct our follow up assessment before any participants left their home environments to begin college or full-time employment, experiences that would introduce a range of other risk factors for psychopathology and alcohol abuse.

Subjects were compensated $35 for participating in the T1 study visit, and $25 for completing the T2 online assessment. Participants in the research described in this paper were treated in accordance with APA ethical standards, and the study was approved by the Institutional Review Boards at University of Washington, Boston Children's Hospital, and University of Pittsburgh.

Statistical Analyses

We used a combination of linear and logistic regression to examine each pathway of our indirect effect models (Baron & Kenny, 1986; Mackinnon et al., 2007). First, we examined associations of violence exposure with psychopathology at T1 and at T2, controlling for T1 levels. Next, we determined whether violence exposure was associated with distress tolerance, the potential mediator, using linear regression to examine time to quit on the PASAT and using logistic regression to examine the log-odds of quitting the PASAT. Then, we examined associations between distress tolerance and psychopathology at T1 and at T2, controlling for T1 psychopathology. Finally, we estimated a mediation model to determine whether there was an indirect effect of violence exposure on change in psychopathology from T1 to T2 through lower distress tolerance. We evaluated precision in this estimate using a bootstrapping approach that provides 95% confidence intervals for indirect effects in statistical mediation estimated from 1000 resamples of the data (Preacher & Hayes, 2008). All regression and mediation analyses were conducted in MPlus, Version 8 (Muthén & Muthén, 2017), using full-information maximum likelihood (FIML) estimation to handle missing data (Schafer & Graham, 2002).

Following analysis of our three main models, we conducted two sensitivity analyses to evaluate whether findings remained significant after controlling for SES. We examined whether associations between violence and T1 psychopathology, change in psychopathology

from T1 to T2, distress tolerance, and indirect effects of violence on change in psychopathology through distress tolerance, remained significant after controlling for SES. Our first sensitivity analysis controlled for poverty. Due to the high level of missing data on family income (n = 140 subjects did not provide this information), reducing our sample size considerably, we conducted a second sensitivity analysis examining the effects of violence over and above maternal education (95% item response rate).

In all models, predictors were mean-centered to facilitate the interpretation of model coefficients. We controlled for T1 psychopathology in all longitudinal models to estimate predictor effects on change from T1 to T2. Sex was included as a covariate in all models.

Results

Descriptive Statistics

Table 1 provides means and standard deviations of all variables. Table 2 depicts bivariate correlations among all variables. Means and standard deviations of CTQ and SAVE subscales that comprise our cumulative violence measure are provided in Table S1 within the Supplemental Materials.

Violence Exposure and Psychopathology

First, we examined the association between violence exposure and each measure of psychopathology at T1. Higher scores on the composite measure of violence exposure were positively associated with higher levels of depression ($\beta = 0.45$, $p < 0.001$, 95% CI [0.33, 0.58]), anxiety ($\beta = 0.16$, $p = 0.004$, 95% CI [0.05, 0.26]), and alcohol abuse ($\beta = 0.31$, $p = 0.001$, 95% CI [0.13, 0.49]) as well as greater odds of abusing alcohol (OR = 1.42, $p = 0.004$, 95% CI [1.16, 1.74]), after adjusting for sex. Next, we investigated the relationship between violence exposure and change in psychopathology over time. We found no significant associations between violence exposure and change in depression, anxiety, alcohol abuse, or likelihood of abusing alcohol from T1 to T2, indicating that violence exposure was associated with higher overall levels of psychopathology at T1 but not change in psychopathology over the relatively short time scale of the present study.

Violence Exposure and Distress Tolerance

Greater violence exposure was associated with lower distress tolerance evidenced by a faster time to quit ($\beta = -0.21$ $p = 0.009$, 95% CI [−0.37, −0.05]) and greater odds of quitting (OR = 1.23, $p = 0.022$, 95% CI [1.05, 1.44]) on the PASAT.

Distress Tolerance and Psychopathology

Lower levels of distress tolerance were not associated with concurrent symptoms of depression, anxiety, alcohol abuse, or likelihood of abusing alcohol at T1. However, when we examined the effects of distress tolerance on psychopathology over time we found that a one standard-deviation decrease in time on the PASAT (i.e. lower distress tolerance) was associated with a 37.0% increase in the odds of abusing alcohol at T2 (OR = 0.63 $p = 0.021$, 95% CI [0.04, 0.94]), controlling for T1 alcohol abuse. The association with increased

alcohol abuse symptoms did not reach statistical significance at T2 ($\beta = -0.11$ p = 0.064, 95% CI [-0.23, 0.01]), controlling for T1 alcohol abuse. Distress tolerance was not associated with an increase in depression or anxiety symptoms from T1 to T2.

Mediation Analysis

Given significant associations between violence exposure and distress tolerance with changes in alcohol abuse, we investigated whether lower distress tolerance mediated the association between violence exposure and increased alcohol abuse using a non-parametric bootstrapping test of mediation that derives confidence intervals from indirect effects estimated across 1000 resamples of data (Preacher & Hayes, 2008). Modern approaches to statistical mediation do not require a significant association in the direct path (i.e., violence exposure to changes in alcohol abuse symptoms) to examine the significance of the indirect effect (Hayes, 2013; MacKinnon et al., 2007).

Lower distress tolerance during the PASAT mediated the association between violence exposure and increased abuse of alcohol from T1 to T2, $\beta = 0.02$, 95% CI [0.01, 0.06]. Lower distress tolerance during the PASAT also mediated the association between violence exposure and greater likelihood of alcohol abuse from T1 to T2, OR = 0.03, 95% CI [0.01, 0.07].

Sensitivity Analyses

Poverty.

To determine whether violence exposure was associated with distress tolerance and psychopathology over and above the effects of SES, we conducted a sensitivity analysis in which we adjusted for poverty. Adjusting for poverty had little impact on the associations of violence exposure with distress tolerance or psychopathology or of distress tolerance with changes in alcohol abuse. In the small subsample that provided information on income (n = 147), the effects of the associations between violence exposure and distress tolerance measured in seconds to quit and likelihood of quitting the task remained similar but shifted to trend-level significance ($p = 0.080$–0.100), and the association between distress tolerance and increased alcohol abuse at T2 reached statistical significance (p = 0.045). All other associations that were significant without inclusion of poverty as a covariate remained statistically significant.

Maternal Education.

We additionally conducted a sensitivity analysis in which we adjusted for maternal education, a second indicator of SES. Adjusting for maternal education had no impact on the significant associations of violence exposure with distress tolerance or psychopathology, distress tolerance with changes in alcohol abuse, or mediation analyses.

Discussion

Consistent evidence suggests that violence exposure in childhood is associated with the onset and persistence of psychopathology, including substance abuse, anxiety, and

depression (Kessler et al., 2005; Keyes et al., 2012; Klitzman & Freudenberg, 2003; McLaughlin et al., 2012; Molnar et al., 2001; Ward et al., 2001). Although disruptions in emotion regulation are frequently posited to be a central mechanism linking violence exposure with multiple forms of psychopathology (Heleniak et al., 2015; McLaughlin & Lambert, 2017), we are unaware of previous studies that have examined distress tolerance as a potential transdiagnostic mechanism linking violence exposure with heightened risk for psychopathology during adolescence. We provide novel evidence from a longitudinal community-based study indicating that exposure to interpersonal violence is associated with diminished ability to tolerate distress in order to persist in goal-related behavior in adolescence. Longitudinal analyses revealed that distress tolerance was associated with a specific pattern of risk for psychopathology, such that low distress tolerance was associated with increased likelihood of problematic alcohol use over time, and mediated the association between violence exposure severity and problematic alcohol use. However, low distress tolerance was not associated with concurrent or later symptoms of anxiety and depression. These findings suggest that distress tolerance is shaped by experiences of threat, specifically exposure to interpersonal violence, and may play a specific role in the development of problematic alcohol use in adolescence.

Consistent with our hypotheses and prior studies on childhood violence exposure (Lansford et al., 2002; McLaughlin et al., 2012), we found significant moderate associations between the degree of exposure to interpersonal violence and concurrent substance use, anxiety and depression symptoms. In the longitudinal analyses, we were additionally able to examine violence exposure and increased symptoms of psychopathology across a four month period of time. In contrast with our baseline results, we found that although the severity of violence exposure was associated with overall initial level of psychopathology, it did not predict changes in alcohol abuse or internalizing symptoms over time. This finding may seem surprising because adolescence is a period of heightened vulnerability for the first onset of these mental health problems. But prior work also suggests that violence exposure is associated with earlier age of first onset of symptoms (Briggs-Gowan et al., 2010; Kessler et al., 2007; Mandelli et al., 2011), meaning that the effects of violence on risk for psychopathology were already present by the time of our baseline assessment in later adolescence. It is also possible that the four-month span between our baseline and follow up assessments did not grant sufficient time to capture meaningful changes in psychopathology related to prior experiences of violence.

In support of our primary hypothesis, we found that greater exposure to interpersonal violence was associated with lower ability to persist in the face of distress. Diminished ability to withstand uncomfortable emotional states among violence-exposed adolescents could reflect an adaptation to early experiences of threat. Heightened attention and sensitivity to negative emotional cues are adaptive responses to being raised in a dangerous environment. This heightened salience of negative emotions may become overwhelming for children who have experienced violence by the time they reach adolescence, when it is developmentally normative to experience negative emotions more often and more strongly than in childhood (Larson & Lampman-Petraitis, 1989; Larson et al., 2002). As a result, adolescents who have experienced violence may be more likely to engage in escape behaviors to modulate distress and reduce their persistence at difficult and frustrating tasks

than adolescents who have not encountered violence. Furthermore, adolescents who have experienced violence may have learned that it is safer to leave distressing situations immediately before evaluating whether the potential threat signaled by distress was real or imagined. As a result, violence-exposed youth have difficulty discriminating between cues of threat and safety (McLaughlin et al., 2016; Pollak et al., 2000; Pollak & Sinha, 2002). Although it may be safer for children to immediately escape distressing activities in dangerous environments, it may result in fewer opportunities to practice persisting through difficult tasks that are challenging but present no threat to personal safety. Although we do not have information specifically on the chronicity of violence exposure within our sample (i.e., when in development these experiences started and ended), we would expect there to be a wide distribution ranging from single episodes to years-long abuse experiences. Indeed, youth in our study endorsed a range of violent experiences from discrete attacks within their communities to subtypes of abuse that tend to be more chronic such as physical abuse. If lower distress tolerance emerges from a pattern of learned safety seeking behavior following violence, we would expect chronicity of violence to strengthen this relationship over time. On the other hand, exposure to a few recent and discrete instances of violence could have a weaker effect on children's behavior, and may explain our small effect sizes. Indeed, larger effects on distress tolerance have been observed among adults with moderate to severe histories of child abuse (Gratz et al., 2007) and here we observe that increased severity of violence exposure was associated with worse distress tolerance. Together with findings from adult studies that also report associations between violence exposure and distress tolerance (Gratz et al., 2007; Vujanovic et al., 2011), our pattern of results raises questions about the conceptualization of distress tolerance as a stable trait insensitive to environmental input.

If violence exposure in childhood makes it more difficult to tolerate negative emotional states, low distress tolerance represents one plausible pathway linking violence exposure with increased symptoms of psychopathology. Indeed, we found that low distress tolerance was associated with a small but significantly increased likelihood of abusing alcohol over several months. These findings suggest that low distress tolerance may represent a vulnerability factor for the development of alcohol use problems during a time when most adolescents are first experimenting with alcohol (Johnston et al., 2016). This is concerning because alcohol abuse in adolescence is associated with a wide range of deleterious behavioral, academic, social, and health consequences (Bonomo et al., 2001; Donovan & Jessor, 1985; Meropol et al., 1995; Valois et al., 1999) including alcohol and substance abuse in adulthood (Englund et al., 2008). Our findings are consistent with the large body of literature demonstrating that low distress tolerance is concurrently associated with substance problems in adults (Buckner et al., 2007; Gorka et al., 2012; Marshall-Berenz et al., 2011; Simons & Gaher, 2005). We extend prior work in this area by demonstrating that low distress tolerance is associated with increased engagement in problematic use of alcohol during adolescence. Of course, our finding should be considered in the context of a large body of research that has identified other potent risk and protective factors for alcohol problems in adolescence. For example, belonging to a religious community and parental monitoring are key environmental factors that are known to buffer teens from initiating and maintaining alcohol abuse by restricting adolescent access to alcohol (Brown et al., 2001; Carroll et al., 2016). On the other hand, parental alcohol use is likely to be associated with

both child maltreatment and heightened risk for adolescent alcohol problems (Lee et al., 2014). Understanding the complex interplay of these and other risk and protective factors for adolescent alcohol use problems will not be possible until we have developed a better understanding of behavioral risk factors, such as distress tolerance, for alcohol problems. As adolescents age and navigate the world independently, low distress tolerance may be one factor that contributes to higher risk of drinking problems once access to alcohol is unrestricted in early adulthood. Overall, our findings underscore the importance of understanding risks associated with low distress tolerance in adolescence, and determining whether early interventions that target distress tolerance specifically before the age of peak vulnerability for alcohol problems might be effective at preventing problematic use.

In contrast, we found that low distress tolerance in adolescence was not associated with current levels or changes in anxiety or depression symptoms. These findings are consistent with the only prior study we are aware of that has examined associations between distress tolerance, internalizing, and externalizing psychopathology over time in a sample of children and early adolescents. Cummings and colleagues (2013) reported that although low distress tolerance predicted internalizing symptoms in children age 9–13, it was not associated with internalizing symptoms by middle adolescence or growth in internalizing symptoms across middle adolescence. In contrast, low distress tolerance did predict growth in externalizing symptoms over this time period. Together, these findings and ours suggest that low distress tolerance is not a transdiagnostic risk factor in adolescence but instead a specific vulnerability for disorders characterized by low behavioral regulation, such as alcohol abuse. Given mixed findings on the association between distress tolerance and anxiety and depression symptoms in adolescent and adult populations (Leyro et al., 2010), an important step for future research will be elucidating the stability of this relationship across the lifespan. While rates of alcohol increase from early to late adolescence, evidence suggests that internalizing symptoms may peak by early adolescence, with depression symptoms remaining stable and anxiety symptoms actually declining by middle-adolescence (McLaughlin & King, 2015). Therefore, it may be important for future research to examine the association between distress tolerance and internalizing symptoms earlier in adolescence.

Overall, our study suggests that low distress tolerance represents a plausible mechanism underlying the association between violence exposure and problematic substance use during adolescence. Indeed, mediation analyses revealed a small but significant indirect effect of interpersonal violence exposure on later problematic alcohol use through low distress tolerance. This builds on prior work identifying other aspects of emotion regulation, such as emotional reactivity and rumination, as mechanisms linking violence exposure with internalizing psychopathology (Heleniak et al., 2015). Here, we demonstrate that behavioral responses to distressing emotional experiences vary as a function of the degree of childhood exposure to violence, and are associated with a small but significant elevations in risk for increased problematic alcohol use during adolescence. These findings suggest the need for future research to examine distress tolerance across development as a construct that is experience and state dependent, rather than an immutable trait. Extensive evidence from treatment studies in children and adults supports this characterization of distress tolerance as a skill that can be improved. Indeed, findings from this study suggest that improving distress tolerance skills should be a specific treatment target for adolescents exposed to interpersonal

violence. Interventions such as Dialectical Behavior Therapy (DBT; Linehan, 1993) and mindfulness-based substance use disorder treatments (Zgierska et al., 2009) that teach tools for remaining present, resisting urges and tolerating distress (e.g. mindfulness and distress tolerance skills), may be particularly effective at reducing risk for substance use disorders among adolescents exposed to violence. Preventive interventions that incorporate these skills to address distress tolerance may be effective for youths who have experienced violence.

Several study limitations should be acknowledged. First, we did not assess ADHD symptoms. Given evidence for a relationship between low distress tolerance and attentional control (Bardeen et al., 2015), it would be useful to control for ADHD symptoms in models predicting psychopathology symptoms. Second, we used a single behavioral task to assess distress tolerance. Although there is a great deal of literature supporting the validity of the PASAT in measuring distress tolerance (for review, see Tombaugh, 2006), it is possible that the adolescents who exhibited low distress tolerance on this task may have been able to endure their distress for a longer period of time had it been more relevant to their personal interests and goals. Although our task is the same as those used in prior work on distress tolerance, future research should not only include self-report measures of more trait-like general distress tolerance but should also consider utilizing behavioral tasks with a variety of cognitive (e.g. verbal rather than mathematical) and social goals to establish whether distress tolerance varies by context and the specificity of distress tolerance in these contexts to psychopathology. Third, we selected the AUDIT as our measure of alcohol abuse because of its excellent reliability and validity and wide use as a screening tool for high-risk drinking among a broad range of samples (Saunders et al., 1993). However, the total score of this measure is weaker at detecting binge drinking, a common use pattern among adolescents (Cortes-Tomas et al., 2017). We addressed the relative weakness of the audit total frequency score by calculating binary problematic alcohol use scores to better capture sporadic but problematic use among our sample. Fourth, we utilized self-report measures of alcohol abuse and depression and anxiety symptomatology rather than administering structured diagnostic interviews of psychopathology. Although administration of a structured interview to establish diagnoses would represent a methodological improvement, the validity of the youth report measures used in this study are well-established (Kovacs, 1992; March et al., 1997; Muris et al., 2002; Reynolds, 1994; Saunders et al., 1993; Saylor et al., 1984), and the use of youth rather than parent report is advantageous when assessing substance use and internalizing symptoms (Cantwell et al., 1997). Fifth, our mediation analysis was modeled using two rather than three timepoints. Although childhood experiences of violence necessarily occurred prior to the study assessments, both prior violence exposure and distress tolerance were measured at the same timepoint. Replication of these findings in samples with multiple longitudinal assessments is an important goal for future research. Sixth, the focus of this paper was to examine distress tolerance as a behavioral phenotype linking threat-related adversity with concurrent and subsequent psychopathology. Given this focus, we adjusted for SES (i.e. poverty and maternal education) in addition to sex. Of course, there are many other co-morbid risks for psychopathology and alcohol abuse such as genetic (parental psychopathology), cognitive (expectancies and motivations), cultural (e.g. religious beliefs), and environmental (e.g. parental monitoring, peer behavior) factors that were outside the focus of this study and that we did not control for (because they were not

assessed in our sample), which may limit generalizability of our results. While such analyses would surely provide a more complex picture of the sequential pathways to these mental health problems, such analyses are beyond the scope of this paper, which was to examine distress tolerance as an understudied potential mechanism linking childhood violence exposure to adolescent mental health problems. Finally, we conducted our follow up assessments four months after the initial assessment. It is possible that a longer follow-up period may have revealed more meaningful associations as greater change in our variables of interest might have been detected. However, selection of a relatively short follow-up period allowed us the opportunity to re-assess our sample before the significant proportion of high school seniors in our sample left for college, increasing risk of attrition and introducing new risks for alcohol and internalizing symptoms. Furthermore, increasing evidence suggests meaningful within-person variability in symptoms of anxiety and depression (Jenness et al., 2019), and in alcohol use (Cho et al., 2001) among individuals over intervals of a similar length.

Exposure to interpersonal violence is associated with reduced distress tolerance during adolescence using a behavioral measure of persistence in the face of distress. Low distress tolerance, in turn, was prospectively associated with increases in problematic alcohol use, but not internalizing psychopathology, over several months and mediated the link between violence exposure and increases in alcohol abuse symptoms. Although future research is needed to further disentangle how other established risks for alcohol problems may influence this pathway, our findings highlight the potential role of distress tolerance as a risk factor for substance use problems specifically shaped by early experiences of threat-related adversity. Interventions that target distress tolerance may be useful in reducing risk of substance use in violence-exposed youth.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

Abramson LY, Metalsky GI, & Alloy LB (1989). Hopelessness depression: A theory-based subtype of depression. Psychological Review, 96(2), 358–372. 10.1037/0033-295X.96.2.358

Adrian M, Jenness JL, Kuehn KS, Smith MR, & McLaughlin KA (2019). Emotion regulation processes linking peer victimization to anxiety and depression symptoms in adolescence. Development and Psychopathology, 31(3), 999–1009. 10.1017/S0954579419000543 [PubMed: 31097052]

Allgaier AK, Frühe B, Pietsch K, Saravo B, Baethmann M, & Schulte-Körne G (2012). Is the Children's Depression Inventory Short version a valid screening tool in pediatric care? A

comparison to its full-length version. Journal of psychosomatic research, 73(5), 369–374. [PubMed: 23062811]

Auerbach RP, Ho M-HR, & Kim JC (2014). Identifying Cognitive and Interpersonal Predictors of Adolescent Depression. Journal of Abnormal Child Psychology, 42(6), 913–924. 10.1007/s10802-013-9845-6 [PubMed: 24398789]

Bardeen JR, Tull MT, Dixon-Gordon KL, Stevens EN, & Gratz KL (2015). Attentional Control as a Moderator of the Relationship Between Difficulties Accessing Effective Emotion Regulation Strategies and Distress Tolerance. Journal of Psychopathology and Behavioral Assessment, 37(1), 79–84. 10.1007/s10862-014-9433-2

Barlow DH, Sauer-Zavala S, Carl JR, Bullis JR, & Ellard KK (2014). The nature, diagnosis, and treatment of neuroticism: Back to the future. Clinical Psychological Science, 2(3), 344–365.

Barnes GM, Welte JW, Hoffman JH, & Dintcheff BA (2005). Shared predictors of youthful gambling, substance use, and delinquency. Psychology of Addictive Behaviors, 19(2), 165–174. [PubMed: 16011387]

Baron RM, & Kenny DA (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51(6), 1173. [PubMed: 3806354]

Beardslee WR, Versage EM, & Gladstone TR (1998). Children of affectively ill parents: A review of the past 10 years. Journal of the American Academy of Child and Adolescent Psychiatry, 37(11), 1134–1141. 10.1097/00004583-199811000-00012 [PubMed: 9808924]

Beck AT, Epstein N, & Harrison R (1983). Cognitions, attitudes and personality dimensions in depression. British Journal of Cognitive Psychotherapy, 1(1), 1–16.

Bernstein A, Trafton J, Ilgen M, & Zvolensky MJ (2008). An evaluation of the role of smoking context on a biobehavioral index of distress tolerance. Addictive Behaviors, 33(11), 1409–1415. 10.1016/j.addbeh.2008.06.003 [PubMed: 18657912]

Bernstein DP, Ahluvalia T, Pogge D, & Handelsman L (1997). Validity of the childhood trauma questionnaire in an adolescent psychiatric population. Journal of the American Academy of Child & Adolescent Psychiatry, 36(3), 340–348. 10.1097/00004583-199703000-00012 [PubMed: 9055514]

Bernstein DP, Fink L, Handelsman L, Foote J, Lovejoy M, Wenzel K, Sapareto E, & Ruggiero J (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. The American Journal of Psychiatry. http://psycnet.apa.org/psycinfo/1995-00092-001

Bernstein DP, Stein JA, Newcomb MD, Walker E, Pogge D, Ahluvalia T, Stokes J, Handelsman L, Medrano M, Desmond D, et al. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. Child Abuse & Neglect, 27(2), 169–190. [PubMed: 12615092]

Boelen PA, & Reijntjes A (2009). Intolerance of uncertainty and social anxiety. Journal of Anxiety Disorders, 23(1), 130–135. 10.1016/j.janxdis.2008.04.007 [PubMed: 18565725]

Bohn MJ, Babor TF, & Kranzler HR (1995). The Alcohol Use Disorders Identification Test (AUDIT): Validation of a screening instrument for use in medical settings. Journal of Studies on Alcohol, 56(4), 423–432. 10.15288/jsa.1995.56.423 [PubMed: 7674678]

Bonn-Miller MO, Zvolensky MJ, & Bernstein A (2009). Discomfort intolerance: Evaluation of incremental validity for panic-relevant symptoms using 10% carbon dioxide-enriched air provocation. Journal of Anxiety Disorders, 23(2), 197–203. 10.1016/j.janxdis.2008.06.007 [PubMed: 18684586]

Bonomo Y, Coffey C, Wolfe R, Lynskey M, Bowes G, & Patton G (2001). Adverse outcomes of alcohol use in adolescents. Addiction (Abingdon, England), 96(10), 1485–1496. 10.1080/09652140120075215

Briggs-Gowan MJ, Carter AS, Clark R, Augustyn M, McCarthy KJ, & Ford JD (2010). Exposure to potentially traumatic events in early childhood: Differential links to emergent psychopathology. Journal of Child Psychology and Psychiatry, 51(10), 1132–1140. 10.1111/j.1469-7610.2010.02256.x [PubMed: 20840502]

Brown TL, Parks GS, Zimmerman RS, & Phillips CM (2001). The role of religion in predicting adolescent alcohol use and problem drinking. Journal of Studies on Alcohol, 62(5), 696–705. [PubMed: 11702809]

Buckner JD, Keough ME, & Schmidt NB (2007). Problematic Alcohol and Cannabis Use among Young Adults: The Roles of Depression and Discomfort and Distress Tolerance. Addictive Behaviors, 32(9), 1957–1963. 10.1016/j.addbeh.2006.12.019 [PubMed: 17258398]

Cantwell DP, Lewinsohn PM, Rohde P, & Seeley JR (1997). Correspondence between adolescent report and parent report of psychiatric diagnostic data. Journal of the American Academy of Child and Adolescent Psychiatry, 36(5), 610–619. 10.1097/00004583-199705000-00011 [PubMed: 9136495]

Carroll HA, Heleniak C, Witkiewitz K, Lewis M, Eakins D, Staples J, … & Larimer ME (2016). Effects of parental monitoring on alcohol use in the US and Sweden: A brief report. Addictive Behaviors, 63, 89–92. [PubMed: 27450154]

Cho YI, Johnson TP, & Fendrich M (2001). Monthly variations in self-reports of alcohol consumption. Journal of Studies on Alcohol, 62(2), 268–272. [PubMed: 11327194]

Cummings JR, Bornovalova MA, Ojanen T, Hunt E, MacPherson L, & Lejuez C (2013). Time doesn't change everything: The longitudinal course of distress tolerance and its relationship with externalizing and internalizing symptoms during early adolescence. Journal of Abnormal Child Psychology, 41(5), 735–748. [PubMed: 23329354]

Cyders MA, & Smith GT (2008). Emotion-based dispositions to rash action: positive and negative urgency. Psychological Bulletin, 134(6), 807. [PubMed: 18954158]

Daughters SB, Lejuez CW, Bornovalova MA, Kahler CW, Strong DR, & Brown RA (2005). Distress tolerance as a predictor of early treatment dropout in a residential substance abuse treatment facility. Journal of Abnormal Psychology, 114(4), 729–734. 10.1037/0021-843X.114.4.729 [PubMed: 16351393]

Daughters SB, Reynolds EK, MacPherson L, Kahler CW, Danielson CK, Zvolensky M, & Lejuez CW (2009). Distress tolerance and early adolescent externalizing and internalizing symptoms: The moderating role of gender and ethnicity. Behaviour Research and Therapy, 47(3), 198–205. 10.1016/j.brat.2008.12.001 [PubMed: 19135649]

Dodge KA, Bates JE, & Pettit GS (1990). Mechanisms in the cycle of violence. Science, 250, 1678–1683. [PubMed: 2270481]

Donovan JE (2004). Adolescent alcohol initiation: A review of psychosocial risk factors. Journal of Adolescent Health, 35(6), 529–e7.

Donovan JE, & Jessor R (1985). Structure of problem behavior in adolescence and young adulthood. Journal of Consulting and Clinical Psychology, 53(6), 890–904. [PubMed: 4086689]

Englund MM, Egeland B, Oliva EM, & Collins WA (2008). Childhood and adolescent predictors of heavy drinking and alcohol use disorders in early adulthood: A longitudinal developmental analysis. Addiction, 103, 23–35. 10.1111/j.1360-0443.2008.02174.x [PubMed: 18426538]

Etkin A, Egner T, Peraza DM, Kandel ER, & Hirsch J (2006). Resolving emotional conflict: A role for the rostral anterior cingulate cortex in modulating activity in the amygdala. Neuron, 51(6), 871–882. 10.1016/j.neuron.2006.07.029 [PubMed: 16982430]

Etkin A, & Schatzberg AF (2011). Common abnormalities and disorder-specific compensation during implicit regulation of emotional processing in generalized anxiety and major depressive disorders. The American Journal of Psychiatry, 168(9), 968–978. 10.1176/appi.ajp.2011.10091290 [PubMed: 21632648]

Finkelhor D, Turner HA, Shattuck A, & Hamby SL (2013). Violence, crime, and abuse exposure in a national sample of children and youth: An update. JAMA Pediatrics, 167(7), 614. 10.1001/jamapediatrics.2013.42 [PubMed: 23700186]

Gorka SM, Ali B, & Daughters SB (2012). The Role of Distress Tolerance in the Relationship between Depressive Symptoms and Problematic Alcohol Use. Psychology of Addictive Behaviors : Journal of the Society of Psychologists in Addictive Behaviors, 26(3), 621–626. 10.1037/a0026386 [PubMed: 22121919]

Gratz KL, Bornovalova MA, Delany-Brumsey A, Nick B, & Lejuez CW (2007). A Laboratory-Based Study of the Relationship Between Childhood Abuse and Experiential Avoidance Among Inner-

City Substance Users: The Role of Emotional Nonacceptance. Behavior Therapy, 38(3), 256–268. 10.1016/j.beth.2006.08.006 [PubMed: 17697851]

Guerra NG, & Huesmann LR (2004). A cognitive-ecological model of aggression. Revue internationale de psychologie sociale, 17, 177–204.

Guerra NG, & Slaby RG (1990). Cognitive mediators of aggression in adolescent offenders: II. Intervention. Developmental Psychology, 26(2), 269.

Gyurak A, Gross JJ, & Etkin A (2011). Explicit and implicit emotion regulation: A dual-process framework. Cognition & Emotion, 25(3), 400–412. 10.1080/02699931.2010.544160 [PubMed: 21432682]

Haegerich TM, & Tolan PH (2008). Core competencies and the prevention of adolescent substance use. New Directions for Child and Adolescent Development, (122), 47–60.

Hastings T, & Kelley M (1997). Development and Validation of the Screen for Adolescent Violence Exposure (SAVE). Journal of Abnormal Child Psychology, 25(6), 511–520. 10.1023/A:1022641916705 [PubMed: 9468111]

Hayes AF (2013). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach (2013–21121–000). Guilford Press.

Heleniak C, Jenness JL, Stoep AV, McCauley E, & McLaughlin KA (2015). Childhood Maltreatment Exposure and Disruptions in Emotion Regulation: A Transdiagnostic Pathway to Adolescent Internalizing and Externalizing Psychopathology. Cognitive Therapy and Research, 40(3), 394–415. 10.1007/s10608-015-9735-z [PubMed: 27695145]

Heleniak C, King KM, Monahan KC, & McLaughlin KA (2017). Disruptions in Emotion Regulation as a Mechanism Linking Community Violence Exposure to Adolescent Internalizing Problems. Journal of Research on Adolescence: The Official Journal of the Society for Research on Adolescence. 10.1111/jora.12328

Herringa RJ, Birn RM, Ruttle PL, Burghy CA, Stodola DE, Davidson RJ, & Essex MJ (2013). Childhood maltreatment is associated with altered fear circuitry and increased internalizing symptoms by late adolescence. Proceedings of the National Academy of Sciences of the United States of America, 110(47), 19119–19124. 10.1073/pnas.1310766110 [PubMed: 24191026]

Hopfer CJ, Crowley TJ, & Hewitt JK (2003). Review of twin and adoption studies of adolescent substance use. Journal of the American Academy of Child & Adolescent Psychiatry, 42(6), 710–719. [PubMed: 12921479]

Hussong AM, Jones DJ, Stein GL, Baucom DH, & Boeding S (2011). An internalizing pathway to alcohol use and disorder. Psychology of Addictive Behaviors, 25(3), 390. [PubMed: 21823762]

Johnson SL, Carver CS, & Joormann J (2013). Impulsive responses to emotion as a transdiagnostic vulnerability to internalizing and externalizing symptoms. Journal of Affective Disorders, 150(3), 872–878. [PubMed: 23726781]

Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE, & Miech RA (2016). Monitoring the Future national survey results on drug use, 1975–2015: Volume II, college students and adults ages 19–55

Jellinek MS, & Snyder JB (1998). Depression and suicide in children and adolescents. Pediatrics in Review, 19(8), 255–264. [PubMed: 9707715]

Joormann J, & Gotlib IH (2010). Emotion Regulation in Depression: Relation to Cognitive Inhibition. Cognition & Emotion, 24(2), 281–298. 10.1080/02699930903407948 [PubMed: 20300538]

Kessler RC, Amminger GP, Aguilar-Gaxiola S, Alonso J, Lee S, & Ustun TB (2007). Age of onset of mental disorders: A review of recent literature. Current Opinion in Psychiatry, 20(4), 359–364. 10.1097/YCO.0b013e32816ebc8c [PubMed: 17551351]

Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, & Walters EE (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. 10.1001/archpsyc.62.6.593 [PubMed: 15939837]

Keyes KM, Eaton NR, Krueger RF, McLaughlin KA, Wall MM, Grant BF, & Hasin DS (2012). Childhood maltreatment and the structure of common psychiatric disorders. The British Journal of Psychiatry, 200(2), 107–115. 10.1192/bjp.bp.111.093062 [PubMed: 22157798]

King KM, Feil MC, & Halvorson MA (2018a). Negative Urgency Is Correlated With the Use of Reflexive and Disengagement Emotion Regulation Strategies. Clinical Psychological Science, 6(6), 822–834. 10.1177/2167702618785619

King KM, McLaughlin KA, Silk J, & Monahan KC (2018b). Peer effects on self-regulation in adolescence depend on the nature and quality of the peer interaction. Development and Psychopathology, 30(4), 1389–1401. 10.1017/S0954579417001560 [PubMed: 29157328]

Klitzman S, & Freudenberg N (2003). Implications of the world trade center attack for the public health and health care infrastructures. American Journal of Public Health, 93(3), 400–406. [PubMed: 12604481]

Kovacs M (1992). Children's depression inventory: Manual. Multi-Health Systems.

Lambert HK, King KM, Monahan KC, & McLaughlin KA (2017). Differential associations of threat and deprivation with emotion regulation and cognitive control in adolescence. Development and Psychopathology, 29(3), 929–940. 10.1017/S0954579416000584 [PubMed: 27424571]

Lansford JE, Dodge KA, Pettit GS, Bates JE, Crozier J, & Kaplow J (2002). A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence. Archives of Pediatrics & Adolescent Medicine, 156(8), 824–830. [PubMed: 12144375]

Larson R, & Ham M (1992). Stress and "storm and stress" in early adolescence: The relationship of negative events with dysphoric affect. Developmental Psychology, 29(1), 130–140. 10.1037/0012-1649.29.1.130

Larson R, & Lampman-Petraitis C (1989). Daily emotional states as reported by children and adolescents. Child Development, 60(5), 1250–1260. [PubMed: 2805902]

Larson RW, Moneta G, Richards MH, & Wilson S (2002). Continuity, stability, and change in daily emotional experience across adolescence. Child Development, 73(4), 1151–1165. [PubMed: 12146740]

Lee JO, Hill KG, Guttmannova K, Hartigan LA, Catalano RF, & Hawkins JD (2014). Childhood and Adolescent Predictors of Heavy Episodic Drinking and Alcohol Use Disorder at Ages 21 and 33: A Domain-Specific Cumulative Risk Model. Journal of Studies on Alcohol and Drugs, 75(4), 684–694. 10.15288/jsad.2014.75.684 [PubMed: 24988267]

Lejuez CW, Kahler Christopher W., & Brown RA (2003). A modified computer version of the Paced Auditory Serial Addition Task (PASAT) as a laboratory-based stressor. The Behavior Therapist, 26(4), 290–293.

Leyro TM, Zvolensky MJ, & Bernstein A (2010). Distress Tolerance and Psychopathological Symptoms and Disorders: A Review of the Empirical Literature among Adults. Psychological Bulletin, 136(4), 576–600. 10.1037/a0019712 [PubMed: 20565169]

Linehan M (1993). Cognitive-behavioral Treatment of Borderline Personality Disorder. Guilford Press.

Lu W (2019). Adolescent Depression: National Trends, Risk Factors, and Healthcare Disparities. American Journal of Health Behavior, 43(1), 181–194. 10.5993/AJHB.43.1.15 [PubMed: 30522576]

MacKinnon DP, Fairchild AJ, & Fritz MS (2007). Mediation Analysis. Annual Review of Psychology, 58, 593. 10.1146/annurev.psych.58.110405.085542

MacPherson L, Reynolds EK, Daughters SB, Wang F, Cassidy J, Mayes LC, & Lejuez CW (2010). Positive and Negative Reinforcement Underlying Risk Behavior in Early Adolescents. Prevention Science, 11(3), 331–342. 10.1007/s11121-010-0172-7 [PubMed: 20309633]

Maisto SA, Conigliaro J, McNeil M, Kraemer K, & Kelley ME (2000). An empirical investigation of the factor structure of the AUDIT. Psychological Assessment, 12(3), 346–353. 10.1037/1040-3590.12.3.346 [PubMed: 11021159]

Mandelli L, Carli V, Roy A, Serretti A, & Sarchiapone M (2011). The influence of childhood trauma on the onset and repetition of suicidal behavior: An investigation in a high risk sample of male prisoners. Journal of Psychiatric Research, 45(6), 742–747. 10.1016/j.jpsychires.2010.11.005 [PubMed: 21115183]

March JS, Parker JDA, Sullivan K, Stallings P, & Conners CK (1997). The Multidimensional Anxiety Scale for Children (MASC): Factor Structure, Reliability, and Validity. Journal of the American

Academy of Child & Adolescent Psychiatry, 36(4), 554–565. 10.1097/00004583-199704000-00019 [PubMed: 9100431]

Marshall-Berenz EC, Vujanovic AA, & MacPherson L (2011). Impulsivity and Alcohol Use Coping Motives in a Trauma-Exposed Sample: The Mediating Role of Distress Tolerance. Personality and Individual Differences, 50(5), 588–592. 10.1016/j.paid.2010.11.033 [PubMed: 21483650]

Marusak HA, Martin KR, Etkin A, & Thomason ME (2015). Childhood trauma exposure disrupts the automatic regulation of emotional processing. Neuropsychopharmacology: Official Publication of the American College of Neuropsychopharmacology, 40(5), 1250–1258. 10.1038/npp.2014.311 [PubMed: 25413183]

McBride NM, Barrett B, Moore KA, & Schonfeld L (2014). The Role of Positive Alcohol Expectancies in Underage Binge Drinking Among College Students. Journal of American College Health, 62(6), 370–379. 10.1080/07448481.2014.907297 [PubMed: 24678848]

McCrory EJ, De Brito SA, Kelly PA, Bird G, Sebastian CL, Mechelli A, Samuel S, & Viding E (2013). Amygdala activation in maltreated children during pre-attentive emotional processing. The British Journal of Psychiatry, 202(4), 269–276. 10.1192/bjp.bp.112.116624 [PubMed: 23470285]

McCrory EJ, De Brito SA, Sebastian CL, Mechelli A, Bird G, Kelly PA, & Viding E (2011). Heightened neural reactivity to threat in child victims of family violence. Current Biology, 21(23), R947–R948. 10.1016/j.cub.2011.10.015 [PubMed: 22153160]

McHugh RK, Reynolds EK, Leyro TM, & Otto MW (2013). An examination of the association of distress intolerance and emotion regulation with avoidance. Cognitive Therapy and Research, 37(2), 363–367. [PubMed: 32773909]

McLaughlin KA (2016). Future Directions in Childhood Adversity and Youth Psychopathology. Journal of Clinical Child & Adolescent Psychology, 45(3), 361–382. 10.1080/15374416.2015.1110823 [PubMed: 26849071]

McLaughlin KA, Green JG, Gruber MJ, Sampson NA, Zaslavsky AM, & Kessler RC (2012). Childhood adversities and first onset of psychiatric disorders in a national sample of US adolescents. Archives of General Psychiatry, 69(11), 1151–1160. [PubMed: 23117636]

McLaughlin KA, & King K (2015). Developmental Trajectories of Anxiety and Depression in Early Adolescence. Journal of Abnormal Child Psychology, 43(2), 311–323. 10.1007/s10802-014-9898-1 [PubMed: 24996791]

McLaughlin KA, & Lambert HK (2017). Child trauma exposure and psychopathology: Mechanisms of risk and resilience. Current Opinion in Psychology, 14(Supplement C), 29–34. 10.1016/j.copsyc.2016.10.004 [PubMed: 27868085]

McLaughlin KA, Peverill M, Gold AL, Alves S, & Sheridan MA (2015). Child Maltreatment and Neural Systems Underlying Emotion Regulation. Journal of the American Academy of Child and Adolescent Psychiatry, 54(9), 753–762. 10.1016/j.jaac.2015.06.010 [PubMed: 26299297]

McLaughlin KA, & Sheridan MA (2016). Beyond Cumulative Risk: A Dimensional Approach to Childhood Adversity. Current Directions in Psychological Science, 25(4), 239–245. 10.1177/0963721416655883 [PubMed: 27773969]

McLaughlin KA, Sheridan MA, & Lambert HK (2014). Childhood adversity and neural development: Deprivation and threat as distinct dimensions of early experience. Neuroscience and Biobehavioral Reviews, 47, 578–591. 10.1016/j.neubiorev.2014.10.012 [PubMed: 25454359]

Meropol SB, Moscati RM, Lillis KA, Ballow S, & Janicke DM (1995). Alcohol-related injuries among adolescents in the emergency department. Annals of Emergency Medicine, 26(2), 180–186. [PubMed: 7618781]

Molnar BE, Buka SL, & Kessler RC (2001). Child sexual abuse and subsequent psychopathology: Results from the National Comorbidity Survey. American Journal of Public Health, 91(5), 753–760. [PubMed: 11344883]

Muris P, Merckelbach H, Ollendick T, King N, & Bogie N (2002). Three traditional and three new childhood anxiety questionnaires: Their reliability and validity in a normal adolescent sample. Behaviour Research and Therapy, 40(7), 753–772. 10.1016/S0005-7967(01)00056-0 [PubMed: 12074371]

Muthén LK, & Muthén BO (1998-2017). Mplus User's Guide. Eighth Edition. Los Angeles, CA: Muthén & Muthén.

Nolen-Hoeksema S (2000). The role of rumination in depressive disorders and mixed anxiety/ depressive symptoms. Journal of Abnormal Psychology, 109(3), 504–511. 10.1037/0021-843X.109.3.504 [PubMed: 11016119]

Nolen-Hoeksema S, Wisco BE, & Lyubomirsky S (2008). Rethinking Rumination. Perspectives on Psychological Science, 3(5), 400–424. 10.1111/j.1745-6924.2008.00088.x [PubMed: 26158958]

Ochsner KN, & Gross JJ (2005). The cognitive control of emotion. Trends in Cognitive Sciences, 9(5), 242–249. 10.1016/j.tics.2005.03.010 [PubMed: 15866151]

Patrick ME, Wray-Lake L, Finlay AK, & Maggs JL (2010). The Long Arm of Expectancies: Adolescent Alcohol Expectancies Predict Adult Alcohol Use. Alcohol and Alcoholism, 45(1), 17– 24. 10.1093/alcalc/agp066 [PubMed: 19808940]

Perry DG, Perry LC, & Rasmussen P (1986). Cognitive social learning mediators of aggression. Child Development, 700–711. [PubMed: 3720399]

Pollak SD, Cicchetti D, Hornung K, & Reed A (2000). Recognizing emotion in faces: Developmental effects of child abuse and neglect. Developmental Psychology, 36(5), 679–688. 10.1037/0012-1649.36.5.679 [PubMed: 10976606]

Pollak SD, & Sinha P (2002). Effects of early experience on children's recognition of facial displays of emotion. Developmental Psychology, 38(5), 784–791. 10.1037/0012-1649.38.5.784 [PubMed: 12220055]

Preacher KJ, & Hayes AF (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behavior Research Methods, 40(3), 879–891. [PubMed: 18697684]

Reinherz HZ, Giaconia RM, Hauf AMC, Wasserman MS, & Paradis AD (2000). General and Specific Childhood Risk Factors for Depression and Drug Disorders by Early Adulthood. Journal of the American Academy of Child & Adolescent Psychiatry, 39(2), 223–231. 10.1097/00004583-200002000-00023 [PubMed: 10673834]

Reynolds WM (1994). Assessment of Depression in Children and Adolescents by Self-Report Questionnaires. In Reynolds WM & Johnston HF (Eds.), Handbook of Depression in Children and Adolescents (pp. 209–234). Springer US.

Rudolph KD, & Hammen C (1999). Age and gender as determinants of stress exposure, generation, and reactions in youngsters: A transactional perspective. Child Development, 70(3), 660–677. [PubMed: 10368914]

Rueter MA, Scaramella L, Wallace LE, & Conger RD (1999). First Onset of Depressive or Anxiety Disorders Predicted by the Longitudinal Course of Internalizing Symptoms and Parent-Adolescent Disagreements. Archives of General Psychiatry, 56(8), 726–732. 10.1001/archpsyc.56.8.726 [PubMed: 10435607]

Saunders JB, Aasland OG, Babor TF, De La Fuente JR, & Grant M (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption-II. Addiction, 88(6), 791–804. 10.1111/j.1360-0443.1993.tb02093.x [PubMed: 8329970]

Saylor CF, Finch AJ, Spirito A, & Bennett B (1984). The children's depression inventory: A systematic evaluation of psychometric properties. Journal of Consulting and Clinical Psychology, 52(6), 955–967. [PubMed: 6520288]

Schafer JL, & Graham JW (2002). Missing data: Our view of the state of the art. Psychological Methods, 7(2), 147–177. 10.1037/1082-989X.7.2.147 [PubMed: 12090408]

Simons JS, & Gaher RM (2005). The Distress Tolerance Scale: Development and Validation of a Self-Report Measure. Motivation and Emotion, 29(2), 83–102. 10.1007/s11031-005-7955-3

Smucker MR, Craighead WE, Craighead LW, & Green BJ (1986). Normative and reliability data for the Children's Depression Inventory. Journal of abnormal child psychology, 14(1), 25–39. [PubMed: 3950219]

Stautz K, & Cooper A (2013). Impulsivity-related personality traits and adolescent alcohol use: A meta-analytic review. Clinical Psychology Review, 33(4), 574–592. [PubMed: 23563081]

Thomason ME, Marusak HA, Tocco MA, Vila AM, McGarragle O, & Rosenberg DR (2015). Altered amygdala connectivity in urban youth exposed to trauma. Social Cognitive and Affective Neuroscience, 10(11), 1460–1468. 10.1093/scan/nsv030 [PubMed: 25836993]

Tomás MTC, Costa JAG, Motos-Sellés P, Beitia MDS, & Mahía FC (2017). The utility of the Alcohol Use Disorders Identification Test (AUDIT) for the analysis of binge drinking in university students. Psicothema, 29(2), 229–235. [PubMed: 28438247]

Tombaugh TN (2006). A comprehensive review of the Paced Auditory Serial Addition Test (PASAT). Archives of Clinical Neuropsychology, 21(1), 53–76. 10.1016/j.acn.2005.07.006 [PubMed: 16290063]

Valois RF, Oeltmann JE, Waller J, & Hussey JR (1999). Relationship between number of sexual intercourse partners and selected health risk behaviors among public high school adolescents. The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine, 25(5), 328–335. [PubMed: 10551663]

Vujanovic AA, Bonn-Miller MO, Potter CM, Marshall EC, & Zvolensky MJ (2011). An Evaluation of the Relation Between Distress Tolerance and Posttraumatic Stress within a Trauma-Exposed Sample. Journal of Psychopathology and Behavioral Assessment, 33(1), 129–135. 10.1007/s10862-010-9209-2 [PubMed: 22039316]

Walker EA, Unutzer J, Rutter C, &, , et al. (1999). Costs of health care use by women hmo members with a history of childhood abuse and neglect. Archives of General Psychiatry, 56(7), 609–613. 10.1001/archpsyc.56.7.609 [PubMed: 10401506]

Ward C, Flisher A, Zissis C, Muller M, & Lombard C (2001). Exposure to violence and its relationship to psychopathology in adolescents. Injury Prevention, 7(4), 297–301. 10.1136/ip.7.4.297 [PubMed: 11770655]

Zgierska A, Rabago D, Chawla N, Kushner K, Koehler R, & Marlatt A (2009). Mindfulness Meditation for Substance Use Disorders: A Systematic Review. Substance Abuse : Official Publication of the Association for Medical Education and Research in Substance Abuse, 30(4), 266–294. 10.1080/08897070903250019

Zvolensky MJ, Vujanovic AA, Bernstein A, & Leyro T (2010). Distress Tolerance: Theory, Measurement, and Relations to Psychopathology. Current Directions in Psychological Science, 19(6), 406–410. 10.1177/0963721410388642 [PubMed: 33746374]

Table 1

Means and standard deviations of violence exposure, distress tolerance, psychopathology symptoms, and SES

Measure	Mean	(SD)
1. Violence	0.00	1.61
2. PASAT Quit Total	104.56	46.32
3. PASAT Quit Bin	0.37	0.49
4. T1 AUDIT Total	1.23	0.41
5. T2 AUDIT Total	1.19	0.30
6. T1 AUDIT Bin	0.50	0.50
7. T2 AUDIT Bin	0.49	0.50
8. T1 CDI Total	10.40	6.89
9. T2 CDI Total	9.87	7.37
10. T1 MASC Total	1.99	0.40
11. T2 MASC Total	2.09	0.41
12. Poverty	0.10	0.30
13. Maternal Education	6.71	2.78

Violence = Total exposure to interpersonal violence, calculated by summing the standardized composites of the Childhood Trauma Questionnaire Total Child Abuse scale and the Screen for Adolescent Violence Exposure Traumatic Violence scale; PASAT Quit Total = distress tolerance measured as time in seconds to quit the third block of the PASAT task; PASAT Quit Bin = the binary distress tolerance measure indicating whether a participant elected to quit the PASAT task; T1 AUDIT Total = Alcohol Use Disorders Identification Test total mean score at Time 1; T2 AUDIT Total = Alcohol Use Disorders Identification Test total mean score at Time 2; T1 AUDIT Bin = Alcohol Use Disorders Identification Test binary score indicating whether a participant did or did not endorse alcohol problems at Time 1; T2 AUDIT Bin = Alcohol Use Disorders Identification Test binary score indicating whether a participant did or did not endorse alcohol problems at Time 2; T1 CDI Total = Children's Depression Inventory total score at Time 1; T2 CDI Total = Children's Depression Inventory total score at Time 2; T1 MASC Total = Multidimensional Anxiety Scale for Children mean symptom score at Time 1; T2 MASC Total = Multidimensional Anxiety Scale for Children mean symptom score at Time 2

Table 2

Correlations of violence exposure, distress tolerance, and psychopathology symptoms

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Violence	—												
2. PASAT Quit Total	−0.21**	—											
3. PASAT Quit Bin	0.16**	−0.93**	—										
4. T1 AUDIT Total	0.31**	−0.05	0.02	—									
5. T2 AUDIT Total	0.18**	−0.08	0.07	0.65**	—								
6. T1 AUDIT Bin	0.22**	0.01	0.01	0.67**	0.57**	—							
7. T2 AUDIT Bin	0.19**	−0.09	0.10	0.55**	0.73**	0.67**	—						
8. T1 CDI Total	0.45**	−0.06	0.02	0.12	0.18**	0.1*	0.17**	—					
9. T2 CDI Total	0.38**	−0.04	0.03	0.11	0.16*	0.10	0.15*	0.73**	—				
10. T1 MASC Total	0.15**	0.06	−0.08	0.03	−0.09	−0.03	−0.12	0.39**	0.31**	—			
11. T2 MASC Total	0.06	0.03	−0.02	0.01	0.01	−0.05	−0.04	0.33**	0.43**	0.60**	—		
12. Poverty	0.01	−0.14	.16*	−0.14	−0.17*	−0.17*	−.18*	−0.09	0.00	−0.10	−0.09	—	
13. Maternal Education	−0.11	0.09	−0.07	0.00	0.00	0.09	0.05	−0.04	−0.06	0.10	0.02	−0.40**	—

Violence = Total exposure to interpersonal violence, calculated by summing the standardized composites of the Childhood Trauma Questionnaire Total Child Abuse scale and the Screen for Adolescent Violence Exposure Traumatic Violence scale; PASAT Quit Total = distress tolerance measured as time in seconds to quit the PASAT task; PASAT Quit Bin = the binary distress tolerance measure indicating whether a participant elected to quit the PASAT task; T1 AUDIT Total = Alcohol Use Disorders Identification Test total mean score at Time 1; T2 AUDIT Total = Alcohol Use Disorders Identification Test total mean score at Time 2; T1 AUDIT Bin = Alcohol Use Disorders Identification Test binary score indicating whether a participant did or did not endorse alcohol problems at Time 1; T2 AUDIT Bin = Alcohol Use Disorders Identification Test binary score indicating whether a participant did or did not endorse alcohol problems at Time 2; T1 CDI Total = Children's Depression Inventory total score at Time 1; T2 CDI Total = Children's Depression Inventory total score at Time 2; T1 MASC Total = Multidimensional Anxiety Scale for Children mean symptom score at Time 1; T2 MASC Total = Multidimensional Anxiety Scale for Children mean symptom score at Time 2

*
p < 0.05,

**
p < 0.01