

# UCSF

## UC San Francisco Previously Published Works

### Title

The prospective impact of adverse childhood experiences on justice-involved youths psychiatric symptoms and substance use.

### Permalink

<https://escholarship.org/uc/item/28s7b6v8>

### Journal

Journal of Consulting and Clinical Psychology, 89(6)

### Authors

Folk, Johanna

Ramos, Lili

Bath, Eraka

et al.

### Publication Date

2021-06-01

### DOI

10.1037/ccp0000655

Peer reviewed



Published in final edited form as:

*J Consult Clin Psychol.* 2021 June ; 89(6): 483–498. doi:10.1037/ccp0000655.

## The Prospective Impact of Adverse Childhood Experiences on Justice-Involved Youth's Psychiatric Symptoms and Substance Use

Johanna B. Folk<sup>a,\*</sup>, Lili M.C. Ramos<sup>a</sup>, Eraka P. Bath<sup>b</sup>, Brooke Rosen<sup>a</sup>, Brandon D.L. Marshall<sup>c</sup>, Kathleen Kemp<sup>d</sup>, Larry Brown<sup>c</sup>, Selby Conrad<sup>c</sup>, Marina Tolou-Shams<sup>a</sup>

<sup>a</sup>University of California, San Francisco, Department of Psychiatry and Behavioral Sciences, 1001 Potrero Ave, San Francisco, CA 94110

<sup>b</sup>University of California, Los Angeles, Department of Psychiatry, 150 UCLA, Medical Plaza Driveway, Los Angeles, CA 90095

<sup>c</sup>The Warren Alpert Medical School of Brown University, Department of Psychiatry and Human Behavior, 222 Richmond St, Providence, RI 02903

<sup>d</sup>The Warren Alpert Medical School of Brown University, School of Public Health, 222 Richmond St, Providence, RI 02903

### Abstract

**Objective:** Justice-involved youth report high rates of adverse childhood experiences (ACEs; abuse, neglect, household dysfunction) and are at high-risk for elevated behavioral health needs (i.e., substance use, psychiatric symptoms). Research with broad samples of adolescents shows ACEs predict behavioral health outcomes, yet most research on the impact of ACEs among justice-involved youth focuses on recidivism. The current study addresses this gap by examining the prospective association between ACEs and psychiatric symptoms, substance use, and substance-related problems (i.e., consequences of use) among first-time justice-involved youth.

**Method:** First-time justice-involved youth ( $n=271$ ; 54.3% male;  $M$  age=14.5 years; 43.5% Latinx; non-Latinx: 34.2% White, 8.6% Black, 7.1% Other, 6.7% Multiracial) and their caregivers were assessed at youth's first court contact and 4- and 12-month follow-ups. Youth and caregivers reported youth's exposure to ACEs through a series of instruments at baseline and 4-months (e.g., Childhood Trauma Questionnaire Short-Form; Traumatic Life Events Inventory). Primary outcomes included youth alcohol and cannabis use (Adolescent Risk Behavior Assessment), consequences of use (Brief Young Adult Alcohol Consequences Questionnaire; Brief Marijuana Consequences Scale), and psychiatric symptoms (Behavior Assessment System for Children; National Stressful Events Survey PTSD Short Scale).

**Results:** Youth were exposed to 3 ACEs, on average, prior to first justice contact ( $M=3$ ). Exposure to more ACEs, particularly abuse, predicted substance use and psychiatric outcomes. Gender differences emerged for cannabis use and internalizing symptoms.

\*Corresponding author. Johanna.Folk@ucsf.edu.

**Conclusions:** Implications for trauma-responsive juvenile justice reform are discussed, including screening for ACEs and their sequelae at first court contact and considering the role of masculine norms.

### Keywords

adverse childhood experiences; juvenile justice; child welfare; substance misuse; psychopathology

---

Justice-involved youth experience high rates of adverse childhood experiences (ACEs; i.e., abuse, neglect, household dysfunction; Baglivio et al., 2014; Felitti et al., 1998b), elevating their risk for behavioral health (e.g., psychiatric symptoms, substance-related problems) needs and further justice involvement (Fox, Perez, Cass, Baglivio, & Epps, 2015; Kerig, Vanderzee, Becker, & Ward, 2012; Wolff, Baglivio, & Piquero, 2017). An abundance of research has documented the association between ACEs and behavioral health outcomes among broad samples of adolescents and adults, but most existing research related to ACEs among justice-involved youth has focused on recidivism (Craig, Zettler, Wolff, & Baglivio, 2019; Fox et al., 2015; Wolff, Cuevas, Intravia, Baglivio, & Epps, 2018). The current study fills this critical gap in the literature by prospectively examining the association between ACEs and behavioral health outcomes (psychiatric symptoms, substance use, consequences of substance use) among first-time justice-involved youth. Understanding youth's exposure to ACEs at their contact with the juvenile court and how this exposure impacts behavioral health needs is crucial to informing trauma-responsive practice within the juvenile justice system.

### Adverse Childhood Experiences

The seminal Centers for Disease Control and Prevention (CDC)-Kaiser ACE study provided a standardized, rigorous approach to characterizing and quantifying effects of childhood adversity across different settings and populations (Felitti et al., 1998; Hughes et al., 2017; Oral et al., 2016). The CDC-Kaiser ACE Study identified ten ACEs belonging to three broad categories: abuse (physical, emotional, sexual), neglect (physical, emotional), and household dysfunction (caregiver substance abuse, caregiver mental illness, caregiver divorce or separation, caregiver incarceration, domestic violence). Of the 9,508 adults surveyed at Wave 1 regarding experiences with abuse and household dysfunction, over half reported experience with at least one ACE, with one-quarter reporting experiencing two or more ACEs (Felitti et al., 1998). Adults who experienced four or more ACEs were at high risk for adverse physical and behavioral health outcomes, including heart disease, alcoholism, drug use, depression, sexually transmitted diseases, and premature death. At Wave 2 when all 10 ACEs were assessed (Dong et al., 2004), two-thirds of respondents reported experience with at least one ACE, and the presence of one ACE significantly increased the likelihood of having experienced additional ACEs (OR: 2 to 17.7 times). The early CDC-Kaiser ACE Study laid the groundwork for a plethora of research on ACEs and their relation to specific health outcomes.

## Relationship between Adverse Childhood Experiences and Behavioral Health Outcomes

The association between ACEs and poor mental health is well-documented across general samples of community youth (Burke, Hellman, Scott, Weems, & Carrion, 2011; Chatterjee et al., 2018; Schilling, Aseltine, & Gore, 2007) and youth with high rates of trauma exposure (e.g., child welfare-involved youth; Kerker et al., 2015). For example, inner-city youth who had more types of maltreatment experiences (emotional, physical, or sexual abuse; physical or emotional neglect) experienced more severe internalizing and externalizing symptoms (Cecil et al., 2017). This study also found differential associations based on type of maltreatment; specifically, emotional abuse was the only maltreatment experience that predicted psychiatric symptoms, including internalizing symptoms, post-traumatic stress disorder (PTSD), anger, and dissociation (Cecil et al., 2017). Past research has also focused on behavioral health outcomes associated specifically with the household dysfunction ACEs. For example, a systematic review of 40 studies with children of incarcerated parents found that youth with a history of parental incarceration were at high risk for antisocial behavior, but not mental health problems, drug use, or educational performance. The authors additionally called for further longitudinal research on the prospective impact of parental incarceration on youth's health outcomes (Murray, Farrington, & Sekol, 2012).

ACEs have also been linked to youth substance use (Benedini & Fagan, 2018; Chatterjee et al., 2018; Scheidell et al., 2018). Studies involving nationwide samples of adolescents have found exposure to any abuse or household dysfunction predicted early initiation of alcohol and cannabis use (Chatterjee et al., 2018), and exposure to any type of abuse or neglect and specific types of household dysfunction (i.e., parental incarceration and binge drinking, exposure to violence) was associated with adolescent cannabis and cocaine use (Scheidell et al., 2018). Notably, dose-response relationships were observed, suggesting exposure to more types of ACEs was associated with drug use in this nationally representative adolescent sample (Scheidell et al., 2018). Studies have also examined the impact of individual ACEs on substance use. For example, in a study of 777 of adolescents participating in the Longitudinal Studies of Child Abuse and Neglect project, exposure to physical, but not sexual, abuse prior to the age of 12 predicted frequency of youth substance use (alcohol, cannabis, cigarettes) at 16 years of age (Benedini et al., 2018).

## Adverse Childhood Experiences among Justice-Involved Youth

Few studies to date have used the ACEs framework to assess the impact of childhood adversity on justice-involved youth. Research with this population thus far has predominately examined the prevalence of ACEs and their impact on recidivism (Baglivio, Wolff, Piquero, & Epps, 2015; Craig, Baglivio, Wolff, Piquero, & Epps, 2017; Craig et al., 2019; Fox et al., 2015; Wolff et al., 2017). Initial findings indicate ACEs are highly prevalent among justice-involved youth and related to risk of re-offense (Baglivio et al., 2014; Kowalski, 2018; Logan-Greene, Kim, & Nurius, 2016), with each additional ACE increasing the risk for serious, violent, chronic offending (Baglivio et al., 2015; Fox et al., 2015; Naramore, Bright, Epps, & Hardt, 2017; Wolff et al., 2017, 2018).

The impact of ACEs on behavioral health has received minimal attention in this population, despite the pervasiveness of psychiatric symptoms, substance use, and substance-related problems among justice-involved youth (Cook, Barnert, Ijadi-Maghsoodi, Ports, & Bath, 2018; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). According to a recent systematic review of the literature on the impact of ACEs among justice-involved youth (Folk et al., 2021), only four studies (reported in eight articles, four of which used the same dataset of youth in Florida and two the same dataset of youth in Washington) have examined the link between ACEs and psychiatric symptoms or mental health problems (Baglivio, Wolff, Piquero et al., 2017; Clements-Nolle & Waddington, 2019; Craig, Zettler, et al., 2019; Lee & Laxman, 2020; Logan-Greene, Kim, & Nurius, 2020; Logan-Greene, Tennyson, Nurius, & Borja, 2017; Muniz et al., 2019; Perez, Jennings, & Baglivio, 2018). These studies reveal a strong positive relationship between ACEs and psychiatric symptoms or mental health problems. One study found increased risk of psychiatric symptoms for youth who experienced four or more ACEs (Clements-Nolle & Waddington, 2019). Three studies (reported in five articles, three drawn from the same dataset of youth in Florida) examined the impact of ACEs on substance use outcomes (Craig et al., 2019; Lee & Taxman, 2020; Logan-Greene et al., 2020; Perez et al., 2018; Perez, Jennings, Piquero, & Baglivio, 2016; Reid et al., 2019). Two studies found exposure to more ACEs was associated with current alcohol and drug use (Craig, Zettler, et al., 2019; Reid et al., 2019) and substance use problems (Perez et al., 2018, 2016). Conversely, two independent latent class analyses revealed youth with elevated substance use treatment needs had lower than average exposure to abuse, neglect, domestic violence, and family history of mental illness (Lee & Taxman, 2020) and youth exposed to more maltreatment had lower than average levels of substance use (Logan-Greene et al., 2020).

Prior research in this area has several limitations. First, studies examining the impact of ACEs among justice-involved youth predominantly focuses on youth who are more entrenched in the system (e.g., detained); understanding the impact of ACEs at first justice system contact is critical to early intervention and prevention of further legal involvement. Second, generalizability of this literature is limited because the studies are predominately from one research group in Florida, rely on justice system records to identify exposure to ACEs, and are cross-sectional designs (Folk et al., 2021). Finally, to our knowledge, prior research has not examined the differential impact of the three ACEs categories (abuse, neglect, household dysfunction) on justice-involved youth's psychiatric symptoms and substance use. Past research suggests abuse ACEs may have a stronger effect on adolescent mental health (Negriff, 2020) and adult mental and physical health (Atzl, Narayan, Rivera, & Lieberman; Chartier et al., 2010) than other types of ACEs (e.g., household dysfunction). Identifying differential associations between categories of ACEs and behavioral health outcomes is critical for the development of targeted interventions.

## **Gender Differences in the Association between ACEs and Behavioral Health Outcomes**

Some evidence suggests there are gender differences in the prevalence of ACEs and the associations between ACEs and behavioral health outcomes (Benedini & Fagan, 2018;

Kowalski, 2018; Schilling et al., 2007). Of note, Baglivio et al. (2014) found that rates of sexual abuse were 4.4 times higher for justice-involved females than males; only 1.8% of females reported no ACEs (compared to 3.1% of males), and 45.1% of females (compared to 27.4% of males) reported five or more ACEs. Regarding differences in the association between ACEs and behavioral health outcomes, among detained youth, experiencing more ACEs is associated with a lower likelihood of having a conduct disorder diagnosis for White and Black males and an increased likelihood of an oppositional defiant disorder diagnosis for Black males and White females (Baglivio, Wolff, Piquero, Greenwald, & Epps, 2017). With increasing involvement of girls in the justice system, who experience higher rates of trauma and mental health conditions than their male counterparts (Fazel, Doll, & Långström, 2008), it is essential to study gender differences to inform development and implementation of gender-responsive treatment in justice settings.

## Current Study

The aim of the current study was to examine the prospective association between ACEs and behavioral health outcomes (i.e., psychiatric symptoms, substance use, consequences of substance use) for first-time justice-involved youth. In a sample of youth and their caregivers assessed over a 12-month period, we evaluated whether number and type of ACEs (assessed at baseline and the 4-month follow-up) longitudinally predicted psychiatric symptoms, substance use, and consequences of substance use (at 12-month follow-up). In addition to a global measure of number of types of ACEs, we also examined the specific associations between number of ACEs within each broad category (abuse, neglect, household dysfunction) and each of these outcomes. Given that youth of color are often subject to overcriminalization of their behavior, which contributes to disproportionate minority contact in the juvenile justice system (e.g., associated with systemic racial bias and profiling; Rovner, 2014), we also explored racial and ethnic differences in the prevalence of ACEs and behavioral health needs, and accounted for ethnicity in multivariate models. Lastly, we explored gender differences in the association between ACEs and behavioral health needs.

It was hypothesized that youth who reported more ACEs in each of the categories (abuse, neglect, household dysfunction) would demonstrate higher levels of psychiatric symptoms, substance use, and consequences of substance use. Consistent with studies of non-justice-involved adolescents (Negriff, 2020), we anticipated a stronger link between the abuse ACEs and trauma symptoms than with the neglect or household dysfunction ACEs. Regarding gender, consistent with prior literature (Baglivio et al., 2014), we expected females to report a greater number of ACEs. We made no a priori hypotheses regarding gender differences in the link between ACEs and prospective behavioral health outcomes due to a paucity of available literature to guide us. We anticipated, however, that the association between ACEs and outcomes might be stronger for females given the documented disproportionate negative impacts of interpersonal traumas such as sexual abuse on females versus males (Kerig, Ward, Vanderzee, & Moeddel, 2009; Kerig, 2018).

## Method

### Participants and Procedure

The current report uses data from the baseline, 4- and 12-month follow-up assessments for a subset of youth and caregiver participants from a larger longitudinal study. Youth eligible to participate in the larger study: 1) were between the ages of 12 and 18 years; 2) had a first-time, open status (e.g., truancy, curfew, alcohol use) and/or delinquent petition (e.g., assault, breaking and entering) filed through a large family court in the northeastern U.S. within the past 30 days; 3) had no prior history of offenses or court-involvement at the time of initial recruitment; 4) had no cognitive impairment that would impede ability to provide informed assent and complete assessments; and 5) had a caregiver who lived in the same household with them for at least six months prior to enrollment and who was willing to participate in the study. All study procedures were approved by the Principal Investigator's university and collaborating sites' Institutional Review Boards and Office for Human Research Protections (see Folk et al., 2020, Hirschtritt et al., 2019, and Tolou-Shams et al., 2019, for additional study procedures).

At baseline of the parent study, 401 youth-caregiver dyads were consented and followed for a period of 24 months and completed assessments every 4 months (7 time-points total). All youth ( $n=313$ ) and caregivers ( $n=324$ ) who participated in the 4-month follow-up assessment were offered the opportunity to separately consent/assent for the youth to complete additional (one-time) measures regarding past traumatic experiences; 273 youth completed these supplementary measures and of these youth, 271 also completed the 12-month follow-up assessment. These 271 youth and their caregivers comprise the sample for the current study.

### Measures

**Demographics.**—Standard demographic characteristics for youth and caregivers were assessed at baseline, including age, gender, race, and ethnicity.

**Adverse childhood experiences (ACEs).**—ACEs, as defined by the CDC-Kaiser seminal study (Dong et al., 2004; Felitti et al., 1998), involve youth's experiences with 10 events and circumstances belonging to three broad categories of maltreatment: abuse, neglect, and household dysfunction. ACEs were assessed through a series of instruments administered at baseline and 4-month follow-up. Responses were operationalized such that exposure to each individual ACE included experiences at any point in the youth's life up to and including the 4-month post-baseline assessment; each ACE was coded as 1=*yes* and 0=*no*. Consistent with prior research among justice-involved youth (e.g., Baglivio et al., 2015; Fox et al., 2015; Wolff et al., 2017), a total score for the number of ACEs youth experienced was used; this method was selected because a categorical (e.g., 4+) approach results in a loss of variance. The assessments used to define each ACE and their prevalence are presented in supplemental material.

**Abuse ACEs.** *Emotional, physical, and sexual abuse* were included in the abuse ACEs category. A sum score reflects number of types of abuse experienced (range 0-3). The

primary assessment to identify experiences with abuse ACEs was the Childhood Trauma Questionnaire Short-Form (CTQ-SF; Bernstein et al., 2003), a 28-item measure of childhood maltreatment, administered at the 4-month follow-up. The CTQ-SF contains five clinical subscales (five items each). Youth rate experiences with different types of maltreatment on a 5-point Likert scale (1=*never* to 5=*very often*). The emotional ( $\alpha = .82$ ; e.g., I thought that my parents wished I had never been born), physical ( $\alpha = .82$ ; e.g., Got hit so hard that I had to see a doctor or go to the hospital), and sexual ( $\alpha = .90$ ; e.g., Someone tried to touch me in a sexual way/made me touch them) abuse subscales were used. Based on recommended a priori cutoff scores (low to moderate = 9-12; moderate to severe = 13-15; severe to extreme = >15), youth who endorsed scores of nine or above on the relevant subscale were considered to have experience with that type of abuse (Marshall, Galea, Wood, & Kerr, 2013). In conjunction with the sexual abuse subscale from the CTQ, a single item from the Traumatic Life Events Inventory (Weathers, Blake, Kaloupek, Marx, & Keane, 2013), administered at the 4-month follow-up assessment, was used to identify youth with exposure to sexual assault. Youth who endorsed having experienced sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm) by reporting “*happened to me*” on a 5-point nominal scale (0=*happened to me*; 1=*witnessed it*; 2=*learned about it*; 3=*not sure*; 4=*doesn't apply*) were considered to have exposure to the sexual abuse ACE.

**Neglect ACEs.** *Emotional and physical neglect* were included in the neglect ACEs category. A sum score reflects number of types of neglect experienced (range 0-2). The emotional ( $\alpha = .87$ ; e.g., I felt loved-reverse scored) and physical ( $\alpha = .61$ ; e.g., I had to wear dirty clothes) neglect subscales of the CTQ-SF (Bernstein et al., 2003) were used. Youth who endorsed scores of 9 or above on the corresponding subscale were considered to have experience with that type of neglect.

**Household dysfunction.** *Caregiver substance abuse, caregiver mental illness, domestic violence, parental separation/divorce, and caregiver incarceration* were included in the household dysfunction ACEs category. A sum score reflects number of types of household dysfunction experienced (range 0-5). All household dysfunction ACEs were assessed at baseline and 4-month follow-up, unless otherwise specified.

Youth exposure to caregiver substance abuse was identified using three items. Caregivers reported whether they had ever: 1) been told by a doctor they have a diagnosis of a substance use disorder; and 2) been in treatment for drug and/or alcohol problems (Parent Risk Behavior Assessment; Donenberg, Emerson, Bryant, Wilson, & Weber-Shifrin, 2001). Youth who responded affirmatively to the CTQ-SF (Bernstein et al., 2003) item “My parents were too drunk or high to take care of the family” at 4-month follow-up were also considered to have experienced the ACE. Youth exposure to caregiver mental illness was assessed using caregiver self-report. Youth were considered to have exposure to the caregiver mental illness ACE if their caregivers endorsed they had ever been told by a doctor they have a psychiatric diagnosis, or they had ever been in treatment for mental health difficulties. Youth exposure to domestic violence was assessed through youth report on the parent domestic violence history subscale of the Adolescent Risk Behavior Assessment (ARBA;

Donenberg et al., 2001). Youth who responded affirmatively that they had ever seen their “parent get pushed, slapped, hit, punched, or beat up by another parent, or their boyfriend or girlfriend?” were considered to have exposure to the domestic violence ACE. Youth who experienced caregiver separation or divorce were identified using caregiver and youth report. Caregivers reported their current marital status; youth with caregivers who endorsed being divorced or separated were considered to have exposure to the caregiver separation or divorce ACE. Youth reported their relationship to the caregiver participating in the study with them; youth who reported the participating caregiver was a stepparent were considered to have exposure to the caregiver separation or divorce ACE. Youth exposure to caregiver incarceration was assessed by caregiver report of whether they had ever been incarcerated. Youth with caregivers who responded affirmatively were considered to have exposure to the caregiver incarceration ACE.

**Youth substance use.**—Past 120 day alcohol and cannabis use was assessed at the 4- and 12-month follow-ups using the ARBA, a validated computer assisted structured interview developed from well-established measures of sexual behavior and drug/alcohol use (Donenberg et al., 2001). Two dichotomous indicators (alcohol, cannabis) were created at each follow-up (0=*no use*, 1=*use*).

Consequences of alcohol and cannabis use were assessed at the 12-month follow-up using the 24-item Brief Young Adult Alcohol Consequences Questionnaire ( $\alpha = .96$ ; Kahler, Strong, & Read, 2005) and the 21-item Brief Marijuana Consequences Scale ( $\alpha = .90$ ; Simons, Dvorak, Merrill, & Read, 2012). The Brief Young Adult Alcohol Consequences Questionnaire and Brief Marijuana Consequences Scale assess severity of consequences associated with alcohol consumption and cannabis use, respectively. Youth respond yes (1) or no (0) to statements describing typical consequences of substance use (e.g., “I have taken foolish risks when I have been drinking” for alcohol consequences; “The quality of my work or schoolwork has suffered because of my marijuana use” for cannabis consequences). Overall scores on both scales were sums of all items endorsed. Higher scores suggested greater consequences associated with alcohol or cannabis use.

**Youth psychiatric symptoms.**—Youth internalizing and externalizing symptoms were assessed at the 4- and 12-month follow-up assessments using the 176-item Behavior Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2006). Comprised of the Atypicality (9 items; e.g., I see weird things; 4-month  $\alpha = .85$ , 12-month  $\alpha = .91$ ), Locus of Control (9 items; e.g., What I want never seems to matter; 4-month  $\alpha = .82$ , 12-month  $\alpha = .77$ ), Social Stress (10 items; e.g., I feel out of place around people; 4-month  $\alpha = .85$ , 12-month  $\alpha = .88$ ), Anxiety (13 items; e.g., I worry but I don’t know why,  $\alpha = .85$ , 12-month  $\alpha = .87$ ), Depression (12 items; e.g., I feel depressed; 4-month  $\alpha = .88$ , 12-month  $\alpha = .88$ ), Sense of Inadequacy (10 items; e.g., I fail at things; 4-month  $\alpha = .81$ , 12-month  $\alpha = .81$ ), and Somatization (7 items; e.g., I often have headaches; 4-month  $\alpha = .73$ , 12-month  $\alpha = .73$ ) subscales, the Internalizing composite scale is a broad index of inwardly directed distress. Youth responded to items using 2-point true or false responses and 4-point Likert scales where 1= *never* and 4= *almost always*. Prior research suggests that whereas adolescents tend to capture and report their internal states accurately (De Los Reyes

et al., 2015), their reports on externalizing behaviors (e.g., oppositional behavior) tend to be less reliable (Loeber, Green, & Lahey, 1990; Loeber, Green, Lahey, & Stouthamer-Loeber, 1991); as such we used adolescent self-report of internalizing symptoms and caregiver report for externalizing symptoms. Comprised of the Hyperactivity (8 items; e.g., Acts without thinking; 4-month  $\alpha = .85$ , 12-month  $\alpha = .84$ ), Aggression (10 items; e.g., Threatens to hurt others; 4-month  $\alpha = .84$ , 12-month  $\alpha = .77$ ), and Conduct Problems (14 items; e.g., Gets into trouble; 4-month  $\alpha = .90$ , 12-month  $\alpha = .90$ ) subscales, the Externalizing composite scale is characterized by disruptive behavior problems such as aggression, hyperactivity and delinquency. Caregivers responded to items on 4-point Likert scales (1= *never* and 4=*almost always*). The sum of points provided a raw score then converted to a T-score (standardized scores with a mean of 50 and standard deviation of 10) based on a general adolescent sample.

Youth trauma symptoms were assessed at the 4- and 12-month assessments using the 9-item National Stressful Events Survey PTSD Short Scale (4-month  $\alpha = .94$ , 12-month  $\alpha = .96$ ; Kilpatrick, Resnick, & Friedman, 2013). Youth rated each item on a 5-point scale (1=*not at all* to 5=*extremely*). Responses were summed to create total scores, with higher scores indicating greater severity of PTSD. Each item also contained a response option, “I have never experienced a stressful event;” entire scales were recoded as missing when more than two items were answered with this response option. In line with scoring instructions, prorated scores ((sum of items answered x total number of items on measure)/number of items answered, rounded to nearest whole number) were calculated when up to two items were left unanswered. Prorated scores were also calculated when youth answered, “I have never experienced a stressful event” (coded as missing) to up to two items if they had experienced at least one abuse ACE ( $n=17$ ).

### Analytic Approach

Analyses were conducted using SPSS statistical software. Preliminary analyses included descriptive statistics and bivariate correlations between all study variables. Regression analyses were conducted to examine our primary study question, whether ACEs (including responses from baseline and 4-month follow-up assessments) prospectively predict youth substance use and psychiatric symptom outcomes (assessed at 12-month follow-up). Linear regressions were used for continuous outcomes (e.g., psychiatric symptoms, consequences of substance use) and logistic regressions were used for dichotomous outcomes (e.g., substance use). We examined ACEs (main predictor) as a total score, in line with prior research, as well as separated by the three ACEs categories (abuse, neglect, and household dysfunction) to determine whether certain categories of ACEs are differentially associated with behavioral health outcomes. All regression analyses controlled for youth age, gender, and ethnicity (i.e., Latinx vs. non-Latinx), as well as prior substance use or psychiatric symptoms (e.g., controlling for past 4-month alcohol use at 4-month follow-up when examining past 4-month alcohol use at 12-month follow-up as outcome). Secondary analyses explored gender differences in the associations between ACEs and youth behavioral health outcomes using interaction terms within linear regression; variables were centered prior to computing interaction terms.

## Results

### Descriptive Statistics and Bivariate Relationships

Justice-involved youth were on average 14.5 years old ( $SD = 1.59$  years), predominantly male (54.3%), and identified as 43.5% Latinx, 34.2% White, non-Latinx, 8.6% Black, non-Latinx, 7.1% Other, non-Latinx, 6.7% Multiracial, non-Latinx). Half of youth endorsed lifetime alcohol or cannabis use at baseline (50.0%), 44.5% reported use in the past 4 months use at the 4-month follow-up and 34.9% at the 12-month follow-up; youth experienced low levels of consequences associated with alcohol ( $M = 0.68$ ,  $SD = 2.81$ ) and cannabis ( $M = 0.89$ ,  $SD = 2.70$ ) use overall at the 12-month follow-up. Average levels of youth internalizing (4-month:  $M = 51.71$ ,  $SD = 14.80$ ; 12-month:  $M = 49.49$ ,  $SD = 14.60$ ) and externalizing (4-month:  $M = 57.50$ ,  $SD = 13.21$ ; 12-month:  $M = 55.69$ ,  $SD = 12.77$ ) symptoms were within normal range and average trauma symptoms (4-month:  $M = 7.43$ ,  $SD = 8.92$ ; 12-month:  $M = 6.03$ ,  $SD = 8.99$ ) were relatively low. On average, youth experienced 3 ACEs by the 4-month follow-up ( $SD = 2$ ; range 0 to 9) and each ACE category had a  $M$  and  $SD$  of 1; 11.2% of youth reported no ACEs. Females ( $M = 2.98$ ,  $SD = 2.11$ ) were exposed to more ACEs than males ( $M = 2.45$ ,  $SD = 1.90$ ),  $t(257) = 2.14$ ,  $p = .034$ , 95% CI [0.04, 1.02],  $d = 0.27$ , specifically higher rates of abuse ( $t(253) = 2.42$ ,  $p = .016$ , 95% CI [0.05, 0.48],  $d = 0.30$ ; females:  $M = 0.84$ ,  $SD = 0.93$ ; males:  $M = 0.57$ ,  $SD = 0.82$ ) and household dysfunction ( $t(182) = 1.90$ ,  $p = .059$ , 95% CI [-0.01, 0.60],  $d = 0.28$ ; females:  $M = 1.22$ ,  $SD = 1.13$ ; males:  $M = 0.92$ ,  $SD = 0.97$ ) ACEs. Of note, females had higher rates of exposure (>5% difference) to emotional and sexual abuse, caregiver substance use and mental illness, and domestic violence (see supplemental table for specific ACEs). There were no significant differences in number of ACEs based on whether youth had a first-time status ( $M = 2.58$ ,  $SD = 1.98$ ) or delinquent ( $M = 2.86$ ,  $SD = 2.06$ ) petition ( $t(258) = -1.14$ ,  $p = .254$ , 95% CI [-0.78, 0.21],  $d = -0.14$ ) or based on race/ethnicity ( $F(4, 252) = 0.59$ ,  $p = .669$ ;  $\eta^2 = 0.009$ , 95% CI [0.00, 0.03]).

Primary study variables were normally distributed and ranges were within expected values. We first examined differences in primary study outcomes based on race and ethnicity (Table 1). There were no significant differences between groups on 12-month follow-up alcohol ( $X^2(4, n = 235) = 6.90$ ,  $p = .14$ ,  $v = .17$ ) or cannabis use ( $X^2(4, n = 234) = 8.28$ ,  $p = .082$ ,  $v = 0.19$ ), consequences of alcohol ( $F(4, 227) = 1.35$ ,  $p = .25$ ;  $\eta^2 = 0.02$ , 95% CI [0.00, 0.06]) or cannabis use ( $F(4, 225) = 0.62$ ,  $p = .43$ ;  $\eta^2 = 0.01$ , 95% CI [0.00, 0.03]), or internalizing ( $F(4, 210) = 0.97$ ;  $\eta^2 = 0.02$ , 95% CI [0.00, 0.05]) or trauma ( $F(4, 174) = 0.69$ ,  $p = .60$ ;  $\eta^2 = 0.02$ , 95% CI [0.00, 0.05]) symptoms. The overall ANOVA for externalizing symptoms ( $F(4, 228) = 2.83$ ,  $p = .03$ ;  $\eta^2 = 0.05$ , 95% CI [0.00, 0.10]), revealed significant differences; however, post-hoc comparisons revealed only a trend difference between the two non-Latinx groups of Black and Multi-racial youth ( $M$  difference = -11.18,  $p = .09$ ), with no other between group differences. Due to small subgroup sizes within the Black, multiracial, and other non-Latinx groups, and the lack of significant differences in outcomes based on race and ethnicity, primary analyses use a binary indicator of whether youth identified as Latinx or not.

Intercorrelations between study variables are presented in Tables 2 and 3. Correlations between number of ACEs in each of the three categories (abuse, neglect, household

dysfunction) were modest ( $r$ s .23 to .42,  $p < .01$ ). Total number of ACEs and number of abuse ACEs were significantly positively correlated with all youth substance use and psychiatric symptom outcomes at the 12-month follow-up. Number of neglect ACEs was modestly correlated with cannabis consequences at the 12-month follow-up. Number of household dysfunction ACEs was correlated with internalizing and trauma symptoms at the 12-month follow-up.

### Relationship between ACEs and Youth Substance Use and Psychiatric Symptoms

Total number of ACEs predicted alcohol use ( $B = 0.19$ ,  $p < .05$ ) and trauma symptoms ( $\beta = 0.17$ ,  $p < .05$ ), but no other 12-month outcomes (Tables 4 and 5). Each additional ACE resulted in a 1.21 increased relative risk of alcohol use and a 0.17 absolute increase in score on the trauma symptoms assessment. As shown in Table 6, number of abuse ACEs predicted youth alcohol ( $B = 0.61$ ,  $p < .01$ ), but not cannabis, use; for every additional ACE youth experienced, relative risk of alcohol use by 1.83. Abuse ACEs also predicted consequences of alcohol ( $\beta = 0.16$ ,  $p < .05$ ) and cannabis ( $\beta = 0.19$ ,  $p < .01$ ) use; each additional ACE reported increased absolute score for consequences of alcohol use by 0.16 and cannabis use by 0.19 (Table 7). As shown in Table 8, abuse ACEs predicted youth externalizing ( $\beta = 0.08$ ,  $p < .05$ ) and trauma symptoms ( $\beta = 0.21$ ,  $p < .05$ ), but not internalizing symptoms; each additional abuse ACE resulted in a 0.08 absolute score increase in externalizing symptoms ( $t$ -score) and 0.21 absolute score increase on the trauma symptoms assessment. The magnitude of these effects, particularly for psychiatric symptom outcomes, are relatively small. Number of neglect and household dysfunction ACEs did not significantly predict any youth outcomes. Effect sizes are represented as odd's ratios (Exp(B)) for logistic regression analyses and through the unstandardized coefficients for linear regression analyses (Tables 4-8).

### Gender Differences

Number of abuse ACEs was most consistently related to youth outcomes and appears to be driving the significant effects for the total ACEs score. As such, gender differences were explored only for the relationships between number of abuse ACEs and youth outcomes. Significant interactions between number of abuse ACEs and gender were found for cannabis use ( $B = 1.09$ ,  $p < .01$ ) and internalizing symptoms ( $\beta = 0.17$ ,  $p < .05$ ) at 12-months. The strong positive association between number of abuse ACEs and youth cannabis use and internalizing symptoms was present for males, but not females (Figure 1).

To determine whether specific abuse ACEs were driving the interaction, we examined the bivariate associations between each abuse type with cannabis use and internalizing symptoms. Physical ( $r = .25$ ,  $p = .005$ ) and sexual ( $r = .19$ ,  $p = .037$ ) abuse were related to 12-month cannabis use for males, but not females; emotional abuse was not related for either gender. Although not significant, the relationship between sexual abuse and cannabis use was of similar magnitude and direction for females ( $r = .13$ ,  $p = .183$ ) as for males; there was no relationship between physical abuse and 12-month cannabis use for females ( $r = .04$ ,  $p = .715$ ). For 12-month internalizing symptoms, emotional abuse was related for both females ( $r = .20$ ,  $p = .050$ ) and males ( $r = .32$ ,  $p = .001$ ), and sexual abuse was significantly related for males ( $r = .24$ ,  $p = .009$ ) and marginally significant for females ( $r = .20$ ,  $p = .054$ );

physical abuse was not related for either gender. As with cannabis use, the association between sexual abuse and 12-month internalizing symptoms was of similar magnitude for males and females, and differences in significance may be due to lower power among the sample of females.

## Discussion

Substance use and psychiatric symptoms have been linked with exposure to childhood adversity among broad samples of adolescents (Oral et al., 2016; Scheidell et al., 2018; Schilling et al., 2007). Justice-involved youth experience particularly high rates of these behavioral health needs, yet studies on the impact of ACEs among justice-involved youth have primarily focused on recidivism (Craig et al., 2017; Wolff et al., 2017). The current study filled this gap in the literature by examining the prospective association between ACEs and substance use, consequences of substance use, and psychiatric symptoms among first-time justice-involved youth.

Youth in the current sample experienced an average of three ACEs, a number comparable to prior research with justice-involved youth. Baviglio et al. (2014) examined ACEs among juveniles who received an official referral in Florida and had since reached the age of 18; they found on average, females experienced four ACEs and males experienced three to four ACEs. The similarity in exposure is notable, particularly since youth in the current study were on average 15 years of age whereas Baviglio et al.'s (2014) participants were at least 18 years old. Our sample also had similar rates of psychiatric symptoms to other justice-involved samples (Perkins, Calhoun, Glaser, & Kunemund, 2016), though lower rates of substance use (Feldstein Ewing, Venner, Mead, & Bryan, 2011). Our data did not account for exact timing of exposure to ACEs; however, youth in the current study were on average 14.5 years old, and as such their exposure to adversity occurred prior to later adolescence. Consistent with developmental psychopathology theory (Cicchetti & Toth, 2009), our results demonstrate early exposure to adversity and in particular abuse, has clear implications for behavioral health sequelae. We found no significant differences in number of ACEs based on whether youth were referred for a status or delinquent offense, suggesting equivalent levels of exposure among both groups of youth. Our data also did not reveal any significant differences in number of ACEs based on race or ethnicity, which is inconsistent with prior studies indicating justice-involved White youth report higher numbers of ACEs (e.g., Baglivio & Epps, 2016).

Although we found no differences in behavioral health needs based on race or ethnicity at the bivariate level, multivariate analyses revealed Latinx youth were less likely to use cannabis. This is consistent with prior literature documenting lower rates of psychiatric symptoms and substance use among Black and Latinx youth compared to White youth involved with the juvenile justice system (e.g., Rawal, Romansky, Jenuwine, & Lyons, 2004; Teplin et al., 2002; Winkelman, Frank, Binswanger, & Pinals, 2017). Given small sample sizes in several racial and ethnic subgroups in our sample, we were unable to examine differences in the associations between ACEs and outcomes and null bivariate findings should be interpreted cautiously. There is some evidence experiencing more ACEs increases the likelihood Black males and White females (compared to White males and Black females,

respectively) are diagnosed with oppositional defiant disorder (Baglivio et al., 2017). Future research is needed to understand how ACEs may differentially impact behavioral health outcomes among youth of color, as well as considering the role of intersecting identities (e.g., gender and race).

Consistent with study hypotheses, exposure to more ACEs was prospectively related to higher levels of behavioral health needs. Of note, youth reporting more ACEs were more likely to use alcohol and experience elevated trauma symptoms. When examining exposure to abuse ACEs specifically, youth who experienced more types of abuse were more likely to use alcohol, experience negative consequences related to alcohol and cannabis use, and to exhibit externalizing and trauma symptoms. These effects were significant above and beyond the strong associations between prior levels of symptoms and prior substance use with these behavioral health outcomes. It is noteworthy that consistent with recent research among non-justice-involved individuals (Atzl et al., 2019; Negriff, 2020), abuse ACEs predicted a range of behavioral health outcomes, whereas neglect and household dysfunction did not. This is not to say experiencing neglect and household dysfunction are not detrimental to a child's development, as much research has shown this is certainly the case (e.g., Burke et al., 2011; Dube et al., 2003; Hughes et al., 2017).

It is possible trauma symptoms mediate the relationship between abuse ACEs and consequences of substance use. For example, youth may use substances to self-medicate and avoid the distressing psychological sequelae of experiencing abuse (Stewart, Pihl, Conrod, & Dongier, 1998). Prior research shows PTSD symptoms influence risk for drug problems during adulthood, and for alcohol problems when PTSD symptoms lead to greater externalizing symptoms (Haller & Chassin, 2013). Future studies of justice-involved youth should examine the mediating role of trauma symptoms between exposure to abuse ACEs and substance use.

The link between experiencing abuse and externalizing symptoms is consistent with prior research. Poor affect regulation, which often manifests through externalizing symptoms (e.g., aggressiveness, impulsivity) is often observed about youth who have been abused (Schore, 2001; Van Der Hart, Nijenhuis, & Steele, 2005). Youth who experience interpersonal violence and victimization are particularly at risk for experiencing externalizing symptoms (Finkelhor, Ormrod, Turner, & Holt, 2009; Ford, Gagnon, Connor, & Pearson, 2011).

Significant gender differences emerged in the associations between abuse ACEs and cannabis use and internalizing symptoms. Specifically, exposure to more types of abuse predicted cannabis use and internalizing symptoms for males, but not females. This is crucial for clinicians to be aware of as masculine norms, or the rules of masculinity, are skewed toward over-identification of externalizing symptoms and under-identification of internalizing symptoms. Masculinity norms can affect the way males seek help and the way clinicians triage for symptoms. Recent guidelines from the American Psychological Association (American Psychological Association Boys and Men Guidelines Group, 2018) suggest there needs to be heightened attention to the role of gender bias in identifying symptoms in males, offering challenges to the notion of hypermasculinity.

Hypermasculinity is a societal phenomenon that disproportionately affects males in terms of considering alternative manifestations of stress. For justice-involved youth, conduct and other externalizing behaviors frequently eclipse clinicians' recognition of internalizing symptoms. Unraveling the interconnections between ACEs, internalizing symptoms, and substance use may provide insight into males' experiences with trauma and their vulnerability to elevated behavioral health needs which place them at-risk for ongoing justice involvement. Males have high rates of internalizing symptoms and have been exposed to multiple ACEs when they come into contact with the court. It is possible reactions to ACEs are driving their internalizing symptoms and cannabis use, putting them at risk for future delinquency (Bender, Postlewait, Thompson, & Springer, 2011).

### **Strengths, Limitations, and Future Directions**

Results of the current study have implications for understanding how ACEs contribute to youth substance use and psychiatric symptoms over time. Strengths of the study include the use of a prospective design, empirically validated assessments, and a multi-informant approach. The sample of youth is also unique in that they were newly justice-involved. Little is known about the functioning of youth immediately after first court involvement and this study sheds light on how ACEs influence key aspects of behavioral health during the first year of justice-involvement.

The study also has several noteworthy limitations. First, we did not employ a single assessment to determine youth's exposure to ACEs, but rather drew this information from a range of assessments. As such, our derivations of the ACEs may differ somewhat from other studies, making direct comparison more challenging. Second, we do not know the exact timing in the youth's development of each ACE. Given that the parent study's primary aims were not centered on trauma, abuse and neglect ACEs were only assessed at the 4-month follow-up as a separate sub-study of the larger parent study. We therefore do not know whether the youth experienced these ACEs prior to first court contact or during the first 4 months following initial contact. Future studies of first-time justice-involved youth should assess exposure to ACEs upon initial contact (e.g., baseline) and the age at which exposure occurred, to determine youth's exposure prior to any justice system contact and any differences based on when in the youth's development the exposure occurred.

Third, we assessed substance use and consequences of substance use through self-report. Within a court context, there is always the concern respondents will be less likely to disclose behavior such as substance use and related consequences, which could have legal implications for the youth. Our data revealed substantial rates of self-reported substance use and consequences of use, suggesting this tendency to underreport was not an overwhelming concern. Future research could examine collateral reports of substance use and associated consequences (e.g., caregiver report, urine toxicology screen results) to corroborate and mitigate the potential biases of self-report.

Despite the racial, ethnic, and gender diversity, youth were sampled from a single family court in the northeastern U.S. Sample size may have limited power to detect significant effects, particularly in our exploration of gender differences in the associations. Although we considered differences between youth charged with status and delinquent offenses, we

did not consider the type of offense (e.g., violent, property) or adjudication status, and our sample did not include youth who committed serious offenses resulting in out-of-home placement (at baseline). Future research could explore differences in the effects of ACEs on behavioral health outcomes based on these justice-related factors, including whether knowing a youth's ACE score at first court contact has any impact on subsequent racial inequities in justice involvement and related outcomes. Future research should explore whether these findings generalize to other regions of the U.S. and internationally. However, the different geographical location and sample from other studies (e.g., Baglivio et al., 2014; Wolff et al., 2017) contributes to expanding findings to different samples and locations in this topic area.

Finally, there are limitations to use of the ACEs score that cut across the literature (Anda, Porter, & Brown, 2020). Perhaps most importantly, the ACE score does not account for the frequency, intensity, or chronicity of exposure to each type of ACE. Two youth can have the same ACE score with very different experiences, and scores do not necessarily reflect the severity of a youth's experience. For example, one youth may have experienced intense repeated exposure to a single type of abuse during a key developmental stage, whereas another may have experienced multiple types of ACEs (e.g., parental separation, emotional neglect, parental mental illness, parental incarceration) at a lower intensity or frequency; the youth with lower level exposure (in terms of intensity, frequency, and chronicity) will have a higher ACE score. The ACEs score also does not account for protective factors that influence the biology of stress response and may result in very different outcomes following ACEs. These limitations should be taken into account when interpreting findings of the current study and the literature on ACEs more broadly.

### **Clinical Implications**

Juvenile justice reform efforts support the enhancement of trauma-responsive practice. According to the Risk Needs Responsivity (RNR) Model (Andrews & Bonta, 2010), trauma and associated behavioral health needs contribute to destabilizing youth, placing them at-risk for continued justice involvement. To address trauma and ACEs, knowing the presence or absence of events in isolation is insufficient to inform the appropriate match between treatment need and referral. Screening youth for the sequelae of trauma and ACEs at the earliest point of juvenile justice involvement is crucial. Identifying psychiatric symptoms without querying about ACEs or trauma history is also insufficient to inform the match between need and referral.

There are significant limitations to simply screening for ACEs, which does not account for intensity, chronicity, frequency, or developmental timing of trauma exposure, and the current state of research does not yet support use of ACEs screening (a population-based research tool) for individual level clinical decision making (Anda et al., 2020). Our findings suggest screening for abuse history is most pertinent to identifying behavioral health needs, and systems might consider using empirically validated tools to assess trauma history (e.g., UCLA PTSD Reaction Index; Kaplow et al., 2020). When a more detailed trauma history can be collected by a trained clinician, this may provide more appropriate information to inform treatment recommendations. Within the juvenile court, however, this is not always

feasible and unless done in a trauma-informed way, may not be appropriate. Despite its limitations, screening for both ACEs (particularly abuse) and psychiatric symptoms may enhance trauma-responsive juvenile justice reform. Information from such screenings should be integrated within a more thorough clinical assessment to make appropriate treatment referrals. For example, gender-specific treatment may be appropriate to reduce the youth's risk of recidivism by enhancing the youth's psychiatric stability and subsequently addressing central RNR factors.

Similarly, our findings indicate abuse history has direct implications for substance use and related problems among first time justice-involved youth. Males with abuse-specific ACEs were more likely to report recent cannabis use; however, males and females with abuse-specific ACEs were equally likely to use alcohol and experience consequences related to cannabis and alcohol use. Therefore, any youth who endorses an abuse history may benefit from referral to substance use prevention services given the risk for both cannabis and alcohol use as well as later consequences. Even brief family- and youth-focused prevention efforts may be successful at reducing risk for substance use (Spoth, Redmond, & Shin, 2001). Successful engagement in substance use prevention proximal to the first court appearance may require training court or diversion staff to deliver prevention services at the court appointment. Delay or provision of information about services without making an active referral and engaging in a warm-handoff risk significant drop off in youth engagement in the substance use prevention.

Finally, consistent with prior recommendations for justice-involved youth, data suggest substance use screens assessing for use instead of criteria for substance use disorder may be more prudent for youth at first court contact. Additional efforts to incorporate consideration of ACEs and substance use screening and brief prevention at early points of justice contact are therefore warranted.

## Summary

The current study examined the prevalence and impact of ACEs on behavioral health outcomes among youth involved in the juvenile justice system for the first time. Results indicate youth have high levels of exposure to ACEs prior to coming into contact with the court, and experiences with abuse are most strongly linked with elevated psychiatric and substance use intervention needs. Gender differences revealed exposure to more types of abuse places males at elevated risk for internalizing symptoms and cannabis use. Although there are noteworthy limitations to ACEs screening that must be considered (Anda et al., 2020; Folk et al., 2021), our results highlight that assessing history of abuse victimization, as well as psychiatric symptoms and substance use, is critical to empirically inform appropriate intervention referrals and recommendations at time of first court contact.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Data Transparency

The current manuscript focuses on adverse childhood experiences, youth substance use and misuse (alcohol and cannabis) and youth mental health (internalizing, externalizing, and trauma symptoms). Hirschtritt et al. (2018) focuses on youth alcohol and cannabis use and consequences, internalizing, and trauma symptoms. Hoskins et al. (2019), Rosen et al. (under review), and Hoskins et al. (under review) focus on youth alcohol and cannabis use, internalizing, externalizing, and trauma symptoms. Folk et al. (2020) and Kemp et al. (under review) focus on youth alcohol and cannabis use and internalizing symptoms. Yonek et al. (2019) focuses on youth internalizing and externalizing symptoms. Tolou-Shams et al. (2019) focuses on youth alcohol and cannabis use and trauma symptoms. Harrison et al. (2020), Jin et al. (in press), and Ng et al. (under review) focus on youth alcohol and cannabis use, internalizing and trauma symptoms. Haney-Caron et al. (2020), Kemp et al. (under review) focus on youth alcohol and cannabis use. Hirschtritt et al. (in press) focuses on youth cannabis use. Tolou-Shams et al. (under review) and Holloway et al. (under review) focus on youth consequences of alcohol and cannabis use, internalizing and externalizing symptoms. Tolou-Shams et al. (in press) focuses on youth alcohol and cannabis use, and internalizing, externalizing, and trauma symptoms.

### Data Transparency References:

1. Hirschtritt ME, Dauria EF, Marshall BD, & Tolou-Shams M (2018). Sexual minority, justice-involved youth: A hidden population in need of integrated mental health, substance use, and sexual health services. *Journal of Adolescent Health*, 63(4), 421–428.
2. Hoskins D, Marshall BD, Koinis-Mitchell D, Galbraith K, & Tolou-Shams M (2019). Latinx youth in first contact with the justice system: trauma and associated behavioral health needs. *Child Psychiatry & Human Development*, 50(3), 459–472. [PubMed: 30483922]
3. Folk JB, Brown L, Marshall B, Ramos LMC, Gopalakrishnan L, Koinis-Mitchell D, & Tolou-Shams M (2020). The prospective impact of family functioning and parenting practices on court-involved youth's substance use and delinquent behavior. *Journal of Youth and Adolescence*, 49(1), 238–251. [PubMed: 31399895]
4. Yonek JC, Dauria EF, Kemp K, Koinis-Mitchell D, Marshall BD, & Tolou-Shams M (2019). Factors associated with use of mental health and substance use treatment services by justice-involved youths. *Psychiatric Services*, 70(7), 586–595. [PubMed: 31138054]
5. Tolou-Shams M, Brown L, Marshall BDL, Dauria E, Koinis-Mitchell D, Kemp K, & Poindexter B (2019). The behavioral health needs of first-time offending justice-involved youth: Substance use, sexual risk, and mental health. *Journal of Child and Adolescent Substance Abuse*, 28(5), 291–303. [PubMed: 34220180]
6. Harrison AJ, Ramo D, Hall S, Estrada-Gonzalez V, & Tolou-Shams M (2020). Cigarette smoking, mental health, and other substance use among court-involved youth. *Substance Use and Misuse*, 55(4), 572–581. [PubMed: 31760909]
7. Haney-Caron E, Brown L, Koinis-Mitchell D, & Tolou-Shams M (2020). HIV testing and risk among justice-involved youth. *Aids and Behavior*. 10.1007/s10461-020-02978-z
8. Jin H, Marshall BDL, Kemp K, & Tolou-Shams M (in press). Prevalence and correlates of self-injurious behaviors among justice-involved youth. *Journal of Correctional Healthcare*.
9. Hirschtritt ME, Folk J, Li Y, Marshall B, & Tolou-Shams M (in press). Cannabis use among minority sexual orientation and gender identity court-involved adolescents. *Journal of the American Academy of Psychiatry and the Law*.
10. Ng MY, Harrison A, Bath EP, Kemp KA, Galbraith K, Brown L, & Tolou-Shams M (under review). Sexting and behavioral health in first-time justice-involved adolescents.

11. Kemp K, Poindexter B, Ng M, Correia V, Marshall B, Koinis-Mitchell D, & Tolou-Shams M (under review). Suicide ideation, suicide attempts, and risk behaviors of first-time court-involved non-incarcerated youth.
12. Kemp K, Poindexter B, Affleck K, Marshall B, Koinis-Mitchell D, & Tolou-Shams M (under review). Developmental maturity and risk behaviors of court-involved non-incarcerated first-time juvenile offenders.
13. Rosen B, Dauria E, Shumway M, Dumoit-Smith J, Koinis-Mitchell, & Tolou-Shams M (under review). Pregnancy attitudes, intentions and related risk behaviors among court-involved non-incarcerated youth.
14. Hoskins D, Meza JI, Del Cid M, Koinis-Mitchell D, Kemp K, Webb M, & Tolou-Shams M (under review). Impact of family, neighborhood, and schools on behavioral health needs of justice-involved Latinx adolescents.
15. Tolou-Shams M, Folk JB, Holloway ED, Ordorica C, Dauria EF, Kemp K, & Marshall BDL (under review). Psychiatric and Substance Related Problems Predict Recidivism For First-Time Justice-Involved Youth.
16. Holloway ED, Folk JB, Ordorica C, & Tolou-Shams M (under review). Peer, substance use, and race-related factors associated with recidivism among first-time justice-involved youth.
17. Tolou-Shams M, Folk JB, Marshall BDL, Dauria E, Kemp K, Li Y, Koinis-Mitchell D, Brown LK (in press). Predictors of cannabis use among first-time justice-involved youth: A Cohort study. *Drug and Alcohol Dependence*.

## Reference

- American Psychological Association Boys and Men Guidelines Group. (2018). APA guidelines for psychological practice with boys and men. Retrieved from <https://www.apa.org/about/policy/boys-men-practice-guidelines.pdf>
- Anda RF, Porter LE, & Brown DW (2020). Inside the Adverse Childhood Experience score: Strengths, limitations, and misapplications. *American Journal of Preventive Medicine*, 000(000), 1–3.
- Andrews DA, & Bonta J (2010). *The psychology of criminal conduct* (5th ed.; Boyne ES, ed.). New Providence, NJ: Anderson.
- Atzl VM, Narayan AJ, Rivera LM, & Lieberman AF (2019). Adverse childhood experiences and prenatal mental health: Type of ACEs and age of maltreatment onset. *Journal of Family Psychology*, 33(3), 304–314. 10.1037/fam0000510 [PubMed: 30802085]
- Baglivio MT, & Epps N (2016). The interrelatedness of adverse childhood experiences among high-risk juvenile offenders. *Youth Violence and Juvenile Justice*, 14, 179–198.
- Baglivio MT, Epps N, Swartz K, Huq MS, Sheer A, & Hardt NS (2014). The prevalence of Adverse Childhood Experiences (ACE) in the lives of juvenile offenders. *OJJDP Journal of Juvenile Justice*, 3(2).
- Baglivio MT, Wolff KT, Piquero AR, & Epps N (2015). The relationship between Adverse Childhood Experiences (ACE) and juvenile offending trajectories in a juvenile offender sample. *Journal of Criminal Justice*, 43(3), 229–241.
- Baglivio MT, Wolff KT, Piquero AR, Greenwald MA, & Epps N (2017). Racial/ethnic disproportionality in psychiatric diagnoses and treatment in a sample of serious juvenile offenders. *Journal of Youth and Adolescence*, 46, 1424–1451. [PubMed: 27665279]
- Bender K, Postlewait AW, Thompson SJ, & Springer DW (2011). Internalizing symptoms linking youths' maltreatment and delinquent behavior. *Child Welfare*, 90(3), 69–89.
- Benedini KM, & Fagan AA (2018). From child maltreatment to adolescent substance use: Different pathways for males and females? *Feminist Criminology*, 1–27.
- Bernstein DP, Stein JA, Newcomb MD, Walker E, Pogge D, Ahluvalia T, ... Zule W (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect*, 27(2), 169–190. [PubMed: 12615092]
- Burke NJ, Hellman JL, Scott BG, Weems CF, & Carrion VG (2011). The impact of adverse childhood experiences on an urban pediatric population. *Child Abuse & Neglect*, 35(6), 408–413. [PubMed: 21652073]

- Chatterjee D, McMorris B, Gower AL, Forster M, Borowsky IW, & Eisenberg ME (2018). Adverse Childhood Experiences and early initiation of marijuana and alcohol use: The potential moderating effects of internal assets. *Substance Use & Misuse*, 53(10), 1624–1632. [PubMed: 29364764]
- Clements-Nolle K, & Waddington R (2019). Adverse Childhood Experiences and psychological distress in juvenile offenders: The protective influence of resilience and youth assets. *Journal of Adolescent Health*, 64(1), 49–55.
- Cook MC, Barnert E, Ijadi-Maghsoudi R, Ports K, & Bath E (2018). Exploring mental health and substance use treatment needs of commercially sexually exploited youth participating in a specialty juvenile court. *Behavioral Medicine*, 44(3), 242–249. [PubMed: 29558256]
- Craig JM, Baglivio MT, Wolff KT, Piquero AR, & Epps N (2017). Do social bonds buffer the impact of Adverse Childhood Experiences on reoffending? *Youth Violence and Juvenile Justice*, 15(1), 3–20.
- Craig JM, Zettler HR, Wolff KT, & Baglivio MT (2019). Considering the mediating effects of drug and alcohol use, mental health, and their co-occurrence on the Adverse Childhood Experiences–recidivism relationship. *Youth Violence and Juvenile Justice*, 17(3), 219–240.
- De Los Reyes A, Augenstein TM, Wang M, Thomas SA, Drabick DAG, Burgers DE, & Rabinowitz J (2015). The validity of the multi-informant approach to assessing child and adolescent mental health. *Psychological Bulletin*, 141(4), 858–900. [PubMed: 25915035]
- Donenberg GR, Emerson E, Bryant FB, Wilson H, & Weber-Shifrin E (2001). Understanding AIDS-risk behavior among adolescents in psychiatric care: Links to psychopathology and peer relationships. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40(6), 642–653. [PubMed: 11392341]
- Dong M, Anda RF, Felitti VJ, Dube SR, Williamson DF, Thompson TJ, ... Giles WH (2004). The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse & Neglect*, 28(7), 771–784. [PubMed: 15261471]
- Dube SR, Felitti VJ, Dong M, Chapman DP, Giles WH, & Anda RF (2003). Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: The Adverse Childhood Experiences Study. *Pediatrics*, 111(3), 564–572. [PubMed: 12612237]
- Fazel S, Doll H, & Långström N (2008). Mental disorders among adolescents in juvenile detention and correctional facilities: A systematic review and metaregression analysis of 25 surveys. *Journal of the American Academy of Child and Adolescent Psychiatry*, 47(9), 1010–1019. [PubMed: 18664994]
- Feldstein Ewing SW, Venner KL, Mead HK, & Bryan AD (2011). Exploring racial/ethnic differences in substance use: A preliminary theory-based investigation with juvenile justice-involved youth. *BMC Pediatrics*, 11(71).
- Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, ... Marks JS (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258. [PubMed: 9635069]
- Finkelhor D, Ormrod R, Turner H, & Holt M (2009). Pathways to poly-victimization. *Child Maltreatment*, 14(4), 316–329. [PubMed: 19837972]
- Folk JB, Brown LK, Marshall BDL, Ramos LMC, Gopalakrishnan L, Koinis-Mitchell D, & Tolou-Shams M (2020). The prospective impact of family functioning and parenting practices on court-involved youth's substance use and delinquent behavior. *Journal of Youth and Adolescence*, 49(1), 238–251. [PubMed: 31399895]
- Folk JB, Kemp K, Yurasek A, Barr-Walker J, & Tolou-Shams M (2021). Adverse Childhood Experiences among justice-involved youth: Data-driven recommendations for action using the Sequential Intercept Model. *American Psychologist*, 76(2), 268–283.
- Ford JD, Gagnon K, Connor DF, & Pearson G (2011). History of interpersonal violence, abuse, and nonvictimization trauma and severity of psychiatric symptoms among children in outpatient psychiatric treatment. *Journal of Interpersonal Violence*, 26(16), 3316–3337. [PubMed: 21362676]
- Fox BH, Perez N, Cass E, Baglivio MT, & Epps N (2015). Trauma changes everything: Examining the relationship between adverse childhood experiences and serious, violent and chronic juvenile offenders. *Child Abuse & Neglect*, 46, 163–173. [PubMed: 25703485]

- Haller M, & Chassin L (2013). The influence of PTSD symptoms on alcohol and drug problems: Internalizing and externalizing pathways. *Psychological Trauma: Theory, Research, Practice, and Policy*, 5(5), 484–493.
- Hirschtritt ME, Dauria ED, Marshall Brandon, D. L., & Tolou-Shams M (2018). Sexual minority, justice-involved youth: A hidden population in need of integrated mental health, substance use, and sexual health services. *Journal of Adolescent Health*, 63, 421–428.
- Hughes K, Bellis MA, Hardcastle KA, Sethi D, Butchart A, Mikton C, ... Dunne MP (2017). The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *The Lancet Public Health*, 2(8), e356–e366. [PubMed: 29253477]
- Kaplow JB, Rolon-Arroyo B, Layne CM, Rooney E, Oosterhoff B, Hill R, ... & Pynoos RS (2020). Validation of the UCLA PTSD Reaction Index for DSM-5: A developmentally informed assessment tool for youth. *Journal of the American Academy of Child & Adolescent Psychiatry*, 59(1), 186–194. [PubMed: 30953734]
- Kerig PK (2018). Polyvictimization and girls' involvement in the juvenile justice system: Investigating gender-differentiated patterns of risk, recidivism, and resilience. *Journal of Interpersonal Violence*, 33(5), 789–809. [PubMed: 29411692]
- Kerig PK, Vanderzee KL, Becker SP, & Ward RM (2012). Deconstructing PTSD: Traumatic experiences, posttraumatic symptom clusters, and mental health problems among delinquent youth. *Journal of Child and Adolescent Trauma*, 5(2), 129–144.
- Kerig PK, Ward RM, Vanderzee KL, & Moeddel MA (2009). Posttraumatic stress as a mediator of the relationship between trauma and mental health problems among juvenile delinquents. *Journal of Youth and Adolescence*, 38(9), 1214–1225. [PubMed: 19669901]
- Kerker BD, Zhang J, Nadeem E, Stein REK, Hurlburt MS, Heneghan A, ... McCue Horwitz S (2015). Adverse childhood experiences and mental health, chronic medical conditions, and development in young children. *Academic Pediatrics*, 15(5), 510–517. [PubMed: 26183001]
- Kowalski MA (2018). Adverse childhood experiences and justice-involved youth: The effect of trauma and programming on different recidivistic outcomes. *Youth Violence and Juvenile Justice*, 17(4), 354–384.
- Logan-Greene P, Kim BKE, & Nurius PS (2016). Childhood adversity among court-involved youth: Heterogeneous needs for prevention and treatment. *Journal of Juvenile Justice*, 5(2), 68–84. [PubMed: 31404461]
- Logan-Greene P, Tennyson RL, Nurius PS, & Borja S (2017). Adverse childhood experiences, coping resources, and mental health problems among court-involved youth. *Child & Youth Care Forum*, 46, 923–946. [PubMed: 33132670]
- Marshall BDL, Galea S, Wood E, & Kerr T (2013). Longitudinal associations between types of childhood trauma and suicidal behavior among substance users: A cohort study. *American Journal of Public Health*, 103(9), 69–75.
- Muniz CN, Fox B, Miley LN, Delisi M, Cigarran GP II, & Birnbaum A (2019). The effects of adverse childhood experiences on internalizing versus externalizing outcomes. *Criminal Justice and Behavior*, 46, 568–589.
- Murray J, Farrington DP, & Sekol I (2012). Children's antisocial behavior, mental health, drug use, and educational performance after parental incarceration: A systematic review and meta-analysis. *Psychological Bulletin*, 138(2), 175–210. [PubMed: 22229730]
- Naramore R, Bright MA, Epps N, & Hardt NS (2017). Youth arrested for trading sex have the highest rates of childhood adversity: A statewide study of juvenile offenders. *Sexual Abuse: Journal of Research and Treatment*, 29(4), 396–410.
- Negriff S (2020). ACEs are not equal: Examining the relative impact of household dysfunction versus childhood maltreatment on mental health in adolescence. *Social Science & Medicine*, 245, 112696. [PubMed: 31785426]
- Oral R, Ramirez M, Coohy C, Nakada S, Walz A, Kuntz A, ... Peek-Asa C (2016). Adverse childhood experiences and trauma informed care: The future of health care. *Pediatric Research*, 79(1–2), 227–233. [PubMed: 26460523]
- Perez NM, Jennings WG, & Baglivio MT (2018). A path to serious, violent, chronic delinquency: The harmful aftermath of adverse childhood experiences. *Crime & Delinquency*, 64, 3–25.

- Perez NM, Jennings WG, Piquero AR, & Baglivio MT (2016). Adverse childhood experiences and suicide attempts: The mediating influence of personality development and problem behaviors. *Journal of Youth and Adolescence*, 45, 1527–1545. [PubMed: 27289554]
- Perkins A, Calhoun GB, Glaser BA, & Kunemund AJ (2016). Identifying trauma symptoms among adjudicated youth using the BASC-2 SRP and CROPS. *The Journal of Forensic Psychiatry and Psychology*, 27(5), 665–683.
- Rawal P, Romansky J, Jenuwine M, & Lyons JS (2004). Racial differences in the mental health needs and service utilization of youth in the juvenile justice system. *The Journal of Behavioral Health Services & Research*, 31(3), 242–254. [PubMed: 15263864]
- Reynolds CR, & Kamphaus RW (2006). *BASC-2: Behavior Assessment System for Children, Second Edition*. Upper Saddle River, NJ: Pearson Education, Inc.
- Rovner J (2014). Disproportionate minority contact in the juvenile justice system (Policy brief). Retrieved from <https://sentencingproject.org/wp-content/uploads/2015/11/Disproportionate-Minority-Contact-in-the-Juvenile-Justice-System.pdf>
- Scheidell JD, Quinn K, McGorray SP, Frueh BC, Beharie NN, Cottler LB, & Khan MR (2018). Childhood traumatic experiences and the association with marijuana and cocaine use in adolescence through adulthood. *Addiction*, 113(1), 44–56. [PubMed: 28645136]
- Schilling EA, Asetline RH, & Gore S (2007). Adverse childhood experiences and mental health in young adults: A longitudinal survey. *BMC Public Health*, 7, 1–10. [PubMed: 17199891]
- Schore AN (2001). Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal*, 22(1–2), 7–66.
- Shonkoff JP, Garner AS, Siegel BS, Dobbins MI, Earls MF, Garner AS, ... Wood DL (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*, 129(1), e232–e246. [PubMed: 22201156]
- Spoth RL, Redmond C, & Shin C (2001). Randomized trial of brief family interventions for general populations: Adolescent substance use outcomes 4 years following baseline. *Journal of Consulting and Clinical Psychology*, 69(4), 627–642. [PubMed: 11550729]
- Stewart SH, Pihl RO, Conrod PJ, & Dongier M (1998). Functional associations among trauma, PTSD, and substance-related disorders. *Addictive Behaviors*, 23(6), 797–812. [PubMed: 9801717]
- Teplin LA, Abram KM, McClelland GM, Dulcan MK, & Mericle AA (2002). Psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry*, 59(12), 1133–1143. [PubMed: 12470130]
- Tolou-Shams M, Brown LK, Marshall BD, Dauria E, Koinis-Mitchell D, Kemp K, & Poindexter B (2019). The behavioral health needs of first-time offending justice-involved youth: substance use, sexual risk, and mental health. *Journal of Child & Adolescent Substance Abuse*, 28(5), 291–303. [PubMed: 34220180]
- Van Der Hart O, Nijenhuis ERS, & Steele K (2005). Dissociation: An insufficiently recognized major feature of complex posttraumatic stress disorder. *Journal of Traumatic Stress*, 18(5), 413–423. [PubMed: 16281239]
- Weathers FW, Blake DD, Kaloupek DG, Marx BP, & Keane, &. (2013). The life events checklist for DSM-5 (LEC-5). National Center for PTSD. Retrieved from [www.ptsd.va.gov](http://www.ptsd.va.gov)
- Winkelman TN, Frank JW, Binswanger IA, & Pinals DA (2017). Health conditions and racial differences among justice-involved adolescents, 2009 to 2014. *Academic Pediatrics*, 17(7), 723–731. [PubMed: 28300655]
- Wolff KT, Baglivio MT, & Piquero AR (2017). The relationship between adverse childhood experiences and recidivism in a sample of juvenile offenders in community-based treatment. *International Journal of Offender Therapy and Comparative Criminology*, 61(11), 1210–1242. [PubMed: 26567183]
- Wolff KT, Cuevas C, Intravia J, Baglivio MT, & Epps N (2018). The effects of neighborhood context on exposure to adverse childhood experiences (ACE) among adolescents involved in the juvenile justice system: Latent classes and contextual effects. *Journal of Youth and Adolescence*, 47(11), 2279–2300. [PubMed: 29968064]

**Public Health Significance:**

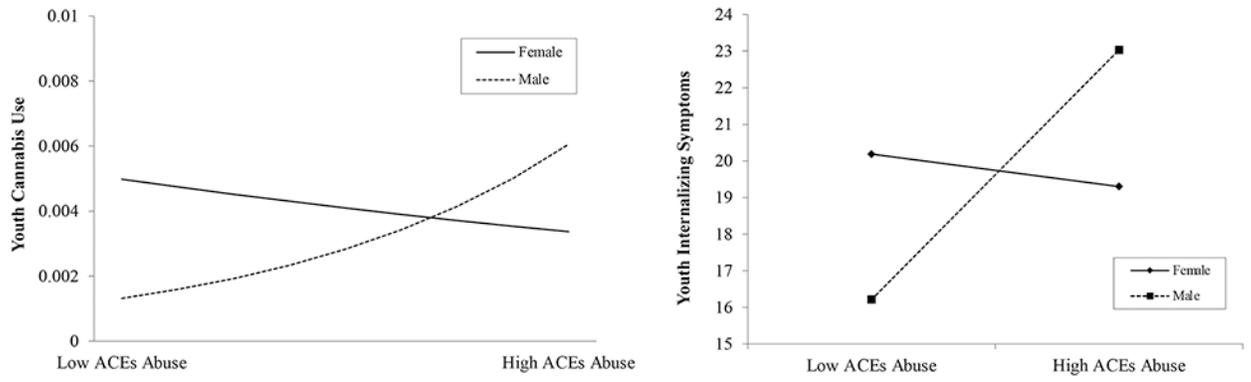
Justice-involved youth experience multiple adverse childhood experiences before coming into contact with the juvenile court, putting them at risk for elevated substance use and psychiatric needs.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript



**Figure 1. Gender differences in the relationship between number of abuse ACEs and youth cannabis use and internalizing symptoms.**  
Note. Variables were centered prior to computing interaction terms.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 1.

Differences in rates of adverse childhood experiences and behavioral health outcomes by race and ethnicity (N=271).

	White, non-Latinx <i>M(SD)</i> , [95% CI]	Black, non-Latinx <i>M(SD)</i> , [95% CI]	Other, non-Latinx <i>M(SD)</i> , [95% CI]	Multi-racial, non-Latinx <i>M(SD)</i> , [95% CI]	Latinx <i>M(SD)</i> , [95% CI]
ACEs	2.64(2.11), [2.19, 3.09]	2.78(1.62), [2.08, 3.48]	2.61(1.24), [1.99, 3.23]	3.44(2.10), [2.32, 4.55]	2.65(2.09), [2.26, 3.04]
Alcohol Consequences	1.23(3.64), [0.43, 2.03]	0.12(0.49), [-0.13, 0.37]	0.24(0.75), [-0.15, 0.62]	0.00(0.00), [0.00, 0.00]	0.51(2.67), [-0.02, 1.03]
Cannabis Consequences	1.20(3.10), [0.51, 1.88]	1.12(3.41), [-0.63, 2.87]	0.24(0.66), [-0.11, 0.58]	0.60(1.18), [-0.06, 1.26]	0.78(2.62), [0.26, 1.30]
Internalizing Symptoms	51.58(14.88), [48.26, 54.89]	50.60(18.33), [40.45, 60.75]	50.00(13.67), [42.97, 57.03]	46.57(12.08), [39.60, 53.55]	47.56(14.02), [44.61, 50.51]
Externalizing Symptoms	57.99(13.49), [55.02, 60.95]	50.32(10.56), [45.23, 55.40]	52.69(11.59), [46.51, 58.86]	61.50(11.71), [54.74, 68.26]	54.30(12.42), [51.87, 56.74]
Trauma Symptoms	6.43(8.76), [4.30, 8.57]	7.45(10.78), [0.21, 14.70]	8.17(10.95), [1.21, 15.12]	6.30(10.67), [-1.33, 13.93]	4.75(7.91), [2.98, 6.52]

**Table 2.**

*Bivariate associations between adverse childhood experiences, demographic factors, and youth substance use and psychiatric symptom outcomes (N=271).*

Variable	Total	Abuse	Neglect	Household Dysfunction
<u>Baseline</u>				
1. Age	.13*	.14*	.08	.01
2. Gender	-.13*	-.15*	-.02	-.15*
3. Latinx	-.03	.02	.04	-.08
<u>4-month follow-up</u>				
4. Alcohol Use	.22***	.17**	.15*	.12
5. Cannabis Use	.14*	.12	.04	.12
6. Internalizing Symptoms	.39***	.39***	.32***	.15 <sup>+</sup>
7. Externalizing Symptoms	.25***	.12	.16*	.24**
8. Trauma Symptoms	.33***	.43***	.13 <sup>+</sup>	.18*
<u>12-month follow-up</u>				
9. Alcohol Use	.21**	.27***	.12 <sup>+</sup>	.10
10. Cannabis Use	.17**	.18**	.07	.11
11. Alcohol Consequences	.14*	.19**	.11	.03
12. Cannabis Consequences	.18**	.25***	.09	.07
13. Internalizing Symptoms	.32***	.35***	.16*	.25**
14. Externalizing Symptoms	.23***	.18**	.09	.14 <sup>+</sup>
15. Trauma Symptoms	.28***	.39***	.07	.20*

Note.

<sup>+</sup>  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

**Table 3.** *Bivariate associations between demographic factors, and youth substance use and psychiatric symptom outcomes (N=271).*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<u>Baseline</u>															
1. Age	-	.03	.02	.35***	.42***	.07	-.09	.06	.22**	.34***	.14*	.22**	-.02	-.12 <sup>+</sup>	-.10
2. Gender		-	.08	-.11 <sup>+</sup>	-.14*	-.28***	.06	-.20**	-.05	-.15*	-.06	-.10	-.23**	.11 <sup>+</sup>	-.18*
3. Latinx			-	-.03	-.00	-.07	-.08	-.04	-.08	-.14*	-.05	-.04	-.11 <sup>+</sup>	-.09	-.13 <sup>+</sup>
<u>4-month follow-up</u>															
4. Alcohol Use				-	.51***	.20**	.06	.22**	.46***	.42***	.15*	.23***	.20**	.03	.11
5. Cannabis Use					-	.18**	.10	.15*	.35***	.51***	.16*	.28***	.15*	.08	.01
6. Internalizing Symptoms						-	.14*	.67***	.15*	.08	.10	.13*	.62***	.09	.49***
7. Externalizing Symptoms							-	.15*	.09	.07	.09	.11	.15*	.84***	.11
8. Trauma Symptoms								-	.24**	.12 <sup>+</sup>	.14 <sup>+</sup>	.08	.45***	.11	.56***
<u>12-month follow-up</u>															
9. Alcohol Use									-	.50***	.45***	.42***	.23**	.10	.16*
10. Cannabis Use										-	.29***	.47***	.19**	.07	.07
11. Alcohol Consequences											-	.75***	.15*	.09	.16*
12. Cannabis Consequences												-	.15*	.05	.10
13. Internalizing Symptoms													-	.17*	.63***
14. Externalizing Symptoms														-	.14
15. Trauma Symptoms															-

Note.

<sup>+</sup> *p*<.10

\* *p*<.05

\*\* *p*<.01

\*\*\* *p*<.001.

**Table 4.** Association between total adverse childhood experiences and youth substance use (N=271).

Variable	Alcohol Use				Cannabis Use				Alcohol Consequences				Cannabis Consequences			
	B	SE	OR	95% CI	B	SE	OR	95% CI	B	SE	$\beta$	95% CI	B	SE	$\beta$	95% CI
Age	0.16	0.13	1.17	0.92, 1.50	0.26*	0.12	1.30	1.03, 1.63	0.17	0.13	.09	-0.10, 0.43	0.23	0.13	.13 <sup>+</sup>	-0.03, 0.48
Latinx	-0.49	0.37	0.61	0.29, 1.27	-0.79*	0.34	0.46	0.23, 0.89	-0.27	0.39	-0.05	-1.04, 0.50	-0.17	0.36	-0.03	-0.88, 0.55
Prior Use	1.91***	0.38	6.76	3.20, 14.28	1.96***	0.36	7.10	3.53, 14.30	0.54	0.46	.09	-0.37, 1.46	1.03	0.41	.18*	0.22, 1.85
Gender	0.20	0.38	1.22	0.58, 2.56	-0.27	0.35	0.77	0.39, 1.52	-0.18	0.40	-0.03	-0.97, 0.61	-0.31	0.38	-0.06	-1.05, 0.43
ACEs	0.19*	0.09	1.21	1.01, 1.44	0.11	0.09	1.12	0.95, 1.32	0.15	0.10	.10	-0.05, 0.35	0.15	0.10	.11	-0.04, 0.34
Constant	-4.80**	1.85	0.01		-5.16*	1.68	0.01		-2.06	1.89		-5.77, 1.66	-2.92	1.78		-6.42, 0.58

Note.

<sup>+</sup>  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

ACEs = adverse childhood experiences; Sx=symptoms; All values represent Step 2 of the model;  $\chi^2$ : Alcohol Use=48.68\*\*\*; Cannabis Use=71.41\*\*\*; Adjusted R<sup>2</sup>: Alcohol Consequences=0.02; Cannabis Consequences=0.08.

**Table 5.** Association between total adverse childhood experiences and youth psychiatric symptoms ( $N=271$ ).

Variable	Internalizing				Externalizing				Trauma			
	B	SE	$\beta$	95% CI	B	SE	$\beta$	95% CI	B	SE	$\beta$	95% CI
Age	-	-	-	-	-	-	-	-	-1.17	0.39	-.21**	-1.94, -0.40
Latinx	-1.89	1.68	-.06	-5.19, 1.42	-0.39	0.94	-.02	-2.25, 1.46	-1.25	1.22	-.07	-3.67, 1.17
Prior Sx	0.54	0.06	.56***	0.42, 0.67	0.82	0.04	.84***	0.75, 0.90	0.48	0.07	.50***	0.35, 0.62
Gender	-1.23	1.74	-.04	-4.66, 2.21	1.93	0.94	.08*	0.07, 3.80	-0.31	1.26	-.02	-2.79, 2.17
ACEs	0.48	0.45	.07	-0.41, 1.37	0.11	0.25	0.02	-0.38, 0.60	0.73	0.31	.17*	0.12, 1.33
Constant	21.22***	3.53		14.26, 28.19	7.36**	2.21		3.01, 11.70	18.13**	5.64		6.97, 29.28

Note.

+  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

$p < .001$ ; Sx=symptoms; ACEs = adverse childhood experiences; All values represent Step 2 of the model; Adjusted  $R^2$ : Internalizing=0.36; Externalizing=0.72; Trauma Symptoms=0.34.

**Table 6.** Association between categories of adverse childhood experiences and youth substance use (N=271).

Variable	Alcohol Use				Cannabis Use			
	B	SE	OR	95% CI	B	SE	OR	95% CI
<b>Abuse ACEs</b>								
Age	0.16	0.13	1.18	0.91, 1.52	0.28*	0.12	1.32	1.05, 1.66
Latinx	-0.63	0.39	0.53	0.25, 1.15	-0.93**	0.36	0.40	0.20, 0.79
Prior Use	2.04***	0.39	7.72	3.58, 16.64	1.91***	0.36	6.72	3.30, 13.65
Gender	0.34	0.39	1.41	0.66, 3.01	-0.26	0.35	0.77	0.39, 1.54
Abuse	0.61**	0.20	1.83	1.24, 2.70	0.29	0.19	1.34	0.93, 1.94
Constant	-4.86*	1.92	0.01		-5.24**	1.70	0.01	
<b>Neglect ACEs</b>								
Age	0.16	0.12	1.17	0.92, 1.49	0.26*	0.12	1.30	1.04, 1.63
Latinx	-0.54	0.37	0.58	0.28, 1.21	-0.83*	0.34	0.44	0.22, 0.85
Prior Use	1.99***	0.38	7.33	3.49, 15.42	1.94***	0.35	6.98	3.49, 13.98
Gender	0.02	0.37	1.02	0.49, 2.09	-0.41	0.34	0.66	0.34, 1.30
Neglect	0.25	0.23	1.29	0.82, 2.03	0.11	0.22	1.11	0.73, 1.70
Constant	-4.35*	1.82	0.01		-4.85**	1.66	0.01	
<b>Household Dysfunction ACEs</b>								
Age	0.09	0.16	1.09	0.80, 1.48	0.23	0.14	1.26	0.96, 1.64
Latinx	-0.52	0.44	0.60	0.25, 1.42	-0.65 <sup>†</sup>	0.39	0.52	0.24, 1.13
Prior Use	2.61***	0.47	13.64	5.45, 34.12	1.94***	0.41	6.97	3.15, 15.41
Gender	0.13	0.45	1.14	0.47, 2.74	-0.40	0.39	0.67	0.31, 1.45
Dysfunction	0.18	0.20	1.20	0.80, 1.78	0.11	0.18	1.11	0.78, 1.59
Constant	-3.46	2.29	0.03		-4.40*	1.98	0.01	

Note.

<sup>†</sup>  $p < .10$

\*  $p < .05$

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

10  
\*\*\*  
\*\*

$p < .001$ . ACEs = adverse childhood experiences; All values represent Step 2 of the model;  $\chi^2$ : Alcohol: Abuse=57.72\*\*\*, Neglect=46.94\*\*\*, Dysfunction=49.32\*\*\*; Cannabis: Abuse=68.53\*\*\*, Neglect=67.91\*\*\*, Dysfunction=47.26\*\*\*.

**Table 7.** Association between categories of adverse childhood experiences and consequences of youth substance use (N=271).

Variable	Alcohol Consequences				Cannabis Consequences			
	B	SE	$\beta$	95% CI	B	SE	$\beta$	95% CI
<b>Abuse ACEs</b>								
Age	0.14	0.14	.07	-0.13, 0.41	0.17	0.13	.10	-0.08, 0.43
Latinx	-0.34	0.40	-0.06	-1.12, 0.44	-0.26	0.36	-.05	-0.98, 0.45
Prior Use	0.57	0.46	.09	-0.34, 1.48	1.12	0.41	.20**	0.31, 1.94
Gender	-0.11	0.41	-0.02	-0.92, 0.69	-0.21	0.38	-.04	-0.95, 0.53
Abuse	0.54	0.24	.16*	0.07, 1.02	0.62	0.22	.19**	0.19, 1.05
Constant	-1.60	1.93		-5.40, 2.20	-2.18	1.80		-5.73, 1.37
<b>Neglect ACEs</b>								
Age	0.17	0.14	.09	-0.10, 0.43	0.22	0.13	.12 <sup>+</sup>	-0.04, 0.48
Latinx	-0.34	0.40	-0.06	-1.12, 0.45	-0.22	0.37	-.04	-0.95, 0.51
Prior Use	0.60	0.47	.10	-0.32, 1.52	1.16	0.42	.20**	0.34, 1.98
Gender	-0.27	0.40	-0.05	-1.06, 0.53	-0.41	0.38	-.07	-1.15, 0.34
Neglect	0.32	0.26	.09	-0.19, 0.82	0.19	0.24	.05	-0.28, 0.66
Constant	-1.83	1.93		-5.63, 1.96	-2.55	1.82		-6.13, 1.03
<b>Household Dysfunction ACEs</b>								
Age	0.34	0.18	.16 <sup>+</sup>	-0.02, 0.70	0.34	0.17	.17*	0.01, 0.67
Latinx	-0.25	0.51	-.04	-1.25, 0.76	-0.13	0.47	-.02	-1.06, 0.81
Prior Use	0.61	0.60	.09	-0.57, 1.79	0.88	0.52	.15 <sup>+</sup>	-0.15, 1.90
Gender	-0.05	0.52	-.01	-1.07, 0.97	-0.36	0.48	-.06	-1.31, 0.59
Dysfunction	0.04	0.24	.01	-0.44, 0.52	0.11	0.22	.04	-0.33, 0.55
Constant	-4.23	2.63		-9.42, 0.97	-4.21 <sup>+</sup>	2.43		-9.00, 0.59

Note.

<sup>+</sup>  $p < .10$

\*  $p < .05$

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

1  
\*\*\*  
\*\*\*

p<.001; ACEs = adverse childhood experiences; All values represent Step 2 of the model; Adjusted R<sup>2</sup>: Alcohol: Abuse=0.04, Neglect=0.02, Dysfunction=0.02; Cannabis: Abuse=0.11, Neglect=0.08, Dysfunction=0.05.

**Table 8.** Association between categories of adverse childhood experiences and youth psychiatric symptoms (N=271).

Variable	Internalizing				Externalizing				Trauma			
	B	SE	$\beta$	95% CI	B	SE	$\beta$	95% CI	B	SE	$\beta$	95% CI
<u>Abuse ACEs</u>												
Age	-	-	-	-	-	-	-	-	-1.19	0.38	-.21**	-1.94, -0.43
Latinx	-2.71	1.63	-.09 <sup>+</sup>	-5.93, 0.50	-0.48	0.97	-.02	-2.39, 1.43	-1.46	1.21	-.08	-3.86, 0.94
Prior Sx	0.59	0.06	.60***	0.47, 0.71	0.82	0.04	.82***	0.75, 0.89	0.47	0.07	.47***	0.32, 0.62
Gender	-0.39	1.70	-.01	-3.74, 2.96	2.18	0.97	.09*	0.27, 4.10	-0.11	1.26	-.01	-2.59, 2.38
Abuse	1.51	1.01	.09	-0.49, 3.51	1.15	0.56	.08*	0.06, 2.25	2.11	0.75	.21**	0.62, 3.60
Constant	19.01***	3.51		12.09, 25.93	7.09**	2.30		2.55, 11.63	18.93**	5.62		7.83, 30.04
<u>Neglect ACEs</u>												
Age	-	-	-	-	-	-	-	-	-1.19	0.40	-.21**	-1.97, -0.41
Latinx	-1.69	1.64	-.06	-4.92, 1.53	-0.20	0.95	-.01	-2.08, 1.67	-1.37	1.24	-.08	-3.82, 1.07
Prior Sx	0.59	0.06	.62***	0.47, 0.71	0.83	0.04	.84***	0.76, 0.90	0.54	0.07	.55***	0.40, 0.67
Gender	-1.25	1.69	-.04	-4.58, 2.08	2.00	0.95	.08*	0.14, 3.86	-1.05	1.26	-.06	-3.54, 1.44
Neglect	-0.81	1.11	-.04	-2.99, 1.37	-0.46	0.60	-.03	-1.65, 0.73	0.61	0.78	.05	-0.94, 2.16
Constant	20.77***	3.45		13.96, 27.58	7.60**	2.24		3.19, 12.01	20.24**	5.79		8.80, 31.67
<u>Household Dysfunction ACEs</u>												
Age	-	-	-	-	-	-	-	-	-0.56	0.46	-.10	-1.48, 0.36
Latinx	-1.99	1.92	-.07	-5.78, 1.80	-0.01	1.04	.00	-2.05, 2.04	-0.83	1.42	-.05	-3.64, 1.98
Prior Sx	0.46	0.07	.52***	0.33, 0.60	0.80	0.04	.87***	0.73, 0.88	0.48	0.08	.51***	0.32, 0.64
Gender	-0.67	2.01	-.03	-4.64, 3.31	2.62	1.04	.11*	0.57, 4.67	-0.89	1.47	-.05	-3.81, 2.03
Household Dysfunction	1.66	0.92	.13 <sup>+</sup>	-0.17, 3.48	-0.60	0.51	-.05	-1.61, 0.40	1.03	0.64	.14	-0.23, 2.30
Constant	23.55***	4.17		15.31, 31.79	8.23**	2.38		3.53, 12.93	10.02	6.75		-3.37, 23.41

Note.

<sup>+</sup>  $p < .10$

\*  $p < .05$

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

\*\*\*  
 $p < .01$

\*\*\*  
 $p < .001$ ; SX=symptoms; ACEs = adverse childhood experiences; All values represent Step 2 of the model; Adjusted  $R^2$ : Internalizing: Abuse=0.42, Neglect=0.38, Dysfunction=0.31; Externalizing: Abuse=0.71, Neglect=0.72, Dysfunction=0.74; Trauma: Abuse=0.36, Neglect=0.33, Dysfunction=0.28.