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## Trauma, Delinquency, and Substance Use: Co-occurring Problems for Adolescent Girls in the Juvenile Justice System

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### Abstract

Girls in the juvenile justice system are known to have high rates of co-occurring childhood abuse, trauma, and substance abuse. Girls with this constellation of problems are at high risk for serious adverse outcomes, including problems with drug dependence and abuse. The relationship between childhood sexual abuse, childhood physical abuse, other types of childhood trauma, and rates of substance use during adolescence were examined for girls in the juvenile justice system. As expected, childhood sexual abuse was significantly related to girls' substance use during adolescence. In contrast to prior research, no link was found between physical abuse, lifetime trauma, and substance use. Limitations and future directions are discussed.

### Keywords

Females; delinquency; substance use; treatment

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Girls in the juvenile justice system are known to have high rates of co-occurring problems and as a result, to be at high risk to experience a host of negative outcomes (Bardone, Moffitt, Caspi, Dickson, & Silva, 1996; Leve & Chamberlain, 2005; Lewis et al., 1991). In particular, prior research suggests high rates of childhood abuse, trauma and co-occurring substance abuse for juvenile justice youths (Belenko & Dembo, 2003; Donovan & Jessor, 1985; Teplin et al. 2005). This constellation of problems is of specific concern due to serious adverse outcomes that are associated with co-occurring delinquency, childhood abuse, trauma and substance use in girls, including a risk for escalating criminal behavior, and drug dependence and abuse (Armstrong & Costello, 2002; Bardone et al., 1996; Mullen, Martin, Anderson, Romans, & Herbison, 1996).

Research on co-occurring problems in girls in the juvenile justice system has helped to highlight the complex profile of this population of youngsters and has helped to highlight the increased risk for continuing and escalating difficulties for such girls as they age (Giordano et al., 2004). Recent research has begun to examine the relationship between childhood trauma and delinquency in girls, suggesting that childhood trauma experiences are predictive of arrests during the adolescent years (e.g., Smith, Leve & Chamberlain, 2006). Despite much being known about the profile and outcomes associated with delinquent girls, less is known about the interplay between various types of childhood trauma experiences and substance use problems in girls with existing delinquency problems. In particular, there is limited information about how childhood abuse and other traumatic childhood experiences relate to adolescent substance abuse in delinquent girls. Given the complex problems faced by delinquent girls and their high risk for negative outcomes as they age, it is important that

the links between co-occurring problems and early adversity are well understood so that prevention and intervention efforts can be directly tailored to meet the unique needs of this population. In this paper we examined the relationship between childhood sexual abuse, childhood physical abuse, other types of childhood trauma, and rates of substance use during adolescence for girls in the juvenile justice system.

## **The Relationship Between Childhood Trauma, Delinquency and Substance Use**

High rates of trauma have been found among girls with conduct problems and delinquency (Anderson et al., 1993; Fleming, 1997; Russell, 1984), with prior research indicating that rates of childhood abuse and co-occurring delinquency in adolescent girls are as high as 80% (Smith et al., 2006). High rates of substance use are well-documented in youths with trauma histories (Goodkind et al., 2006; Lipschitz et al., 2003) as well as in delinquent youth populations (Abram et al., 2007; Goldstein et al., 2003; Lederman et al., 2004), and adverse social, health, and mental health outcomes for youths with such co-occurring problems are well known (Bardone et al., 1996; Lewis et al., 1991; Mullen et al., 1996; Pajer, 1998; Robins, 1966; White, Loeber, Stouthamer-Loeber, & Farrington, 1999; Zoccolillo, 1993). Although causal relationships between childhood trauma, delinquency, and substance abuse have not been fully explained, prior research has helped to specify links between each.

### **Trauma and delinquency**

Prior research suggests a link between childhood family trauma and the development of delinquent behavior (Brown et al., 1999; McCord, 1983), with some research suggesting that higher rates of family dysfunction in delinquent girls increases the risk for trauma exposure and the development of trauma-related mental health problems (Lewis et al., 1991; Smith et al., 2006). Researchers also have suggested a specific link between childhood trauma experiences and the development of later delinquency. In particular, it has been suggested that trauma exposure may exacerbate the development of coercive processes between a youth and his/her parent. Traumatized children may be more emotionally over-reactive and more likely to engage in coercive and noncompliant behaviors (Snyder, Schrepferman, & St. Peter, 1997), which may in turn lead to higher levels of parental reactivity and harsh parental responses (Lytton, 1990). It has also been suggested that traumatic exposure -especially exposure to violent events - may increase the likelihood of aggressive behavior (Ruchkiin, Schwab-Stone, Kogosov, et al., 2002). The effects of a traumatic event alone partially has been suggested to account for many of the features central to conduct problem behavior such as lack of empathy, impulsivity, anger, acting-out, and resistance to treatment (Greenwald, 2002). Regardless of the causal factors relating trauma experiences and delinquent behavior in girls, their coexistence has been shown to be associated with increases in girls' problem behavior and poor outcomes. Specifically, evidence has shown that girls with co-occurring trauma and delinquency are at increased risk for greater delinquent involvement (i.e., higher arrest rates) and health-risking sexual behavior (e.g., Smith et al., 2006).

### **Trauma and substance use**

Research has long shown an association between trauma experiences and substance use problems (Kaysen, Simpson, Dillworth, Larimer, Gunter, & Resnick, 2006; Kilpatrick et al., 2000; Stewart, Pihl, Conrod, & Dongier, 1998) with rates of comorbidity as high as 75% (Kulka, Schlenger, Fairbank, Hough, Jordan, Mannar & Weiss, 1990). Although a majority of studies on trauma and substance use have used adult samples, studies of adolescents also show high rates of co-occurring substance abuse and trauma exposure, with up to 54% of youths in inpatient substance abuse settings meeting criteria for PTSD (Stevens, Murphey & McKnight, 2003). Co-occurring trauma exposure and substance abuse has been found to be

particularly high in females, with studies reporting rates for adult females that are nearly twice that of adult males (Najavits, Weiss & Shaw, 1997), and rates for adolescent females as high as three times that of adolescent males (Deykin & Buka, 1997).

Much of the prior research on trauma and substance use has focused on the relationship between trauma-related mental health symptoms and substance use and abuse. Greater trauma symptoms have been found to be associated with higher rates of tobacco use, drug use, and with the use of "hard" drugs (e.g., crack, cocaine, opiates, hallucinogens, tranquilizers) in adults (Baschnagel, Coffey, Schumacher, Drobos & Saladin, 2008; Williams, Smith, Gotman, Sabri, An & Hall, 2008). Although prior research suggests that greater trauma symptoms are related to higher rates of substance use, studies of substance use among adolescent girls have been mixed, with some studies finding similar rates of alcohol and drug use for adolescents with clinical and non-clinical levels of trauma-related mental health symptoms (Lipschitz et al., 2003).

Trauma exposure - regardless of the presence of trauma-related mental health symptoms - has also been linked to substance use. For example, childhood trauma has been linked to tobacco use (Roberts, Fuemmeler, McClernon & Beckham, 2008) and alcohol abuse (Schumacher, Coffey & Stasiewicz, 2006), and childhood sexual abuse has been linked to tobacco, alcohol and drug use in adults (Hamburger, Leeb & Swahn, 2008; Hayatbakinsh, et al., 2009; Nelson, Heath, Lynskey, Bucholz, Madden, Statham, & Martin, 2006). High rates of childhood physical and sexual abuse and co-occurring alcohol problems have been found among incarcerated women (Mullings, Hartley & Marquart, 2004), and childhood sexual and physical abuse also have been shown to be related to earlier onset of alcohol use among males and females (Brems, Johnson, Neal & Freemon, 2004). Additionally, greater trauma exposure has been linked to greater severity of substance use, with a positive relationship between the number of trauma experiences and higher rates of tobacco, alcohol, and drug use (Boyd-Bell, Manson, Noonan, & Beals, 2006; Lipschitz, Rasmusson, Anyan, Gueorguieva, Billingslea, Cromwell & Southwick, 2003). Recent research on developmental pathways to adolescent substance use has helped to illuminate the interplay between child maltreatment, internalizing and externalizing problems, and adolescent substance use, suggesting that early childhood maltreatment might set the stage for a developmental process that leads to increased drug use (i.e., marijuana; Oshri, Rogosch, Burnett, & Cicchetti, 2011).

## Hypotheses

Although prior research has demonstrated high rates of childhood abuse, trauma and co-occurring substance use in girls in the juvenile justice system, there is a gap in knowledge regarding the specific relationship between these conditions. In particular, little is known about the relationships between various types of childhood abuse, trauma and adolescent substance use among girls with existing delinquency problems. In the current study, we hypothesized that girls with more childhood trauma experiences would be at greater risk for substance use in adolescence. Given that prior research has linked childhood sexual abuse to drug and alcohol use among adult women, we expected girls with greater sexual abuse experiences to show greater drug and alcohol use during adolescence. Based on prior research linking childhood physical abuse and alcohol use, we hypothesized that girls with more physical abuse would have greater alcohol use during adolescence.

## Method

### Participants

Participants were 166 adolescent girls who were referred to treatment for chronic delinquency problems by the Oregon State juvenile justice system after being court-mandated to out-of-home care. Inclusion criteria for the study were as follows: history of arrest, court-mandated to out-of-home placement, female, and age 13–17 years. At placement, the girls were approximately 15 years old ( $M = 15.31$ ;  $SD = 1.17$ ). The ethnic composition of the sample was as follows: 74% Caucasian, 2% African American, 7% Hispanic, 4% Native American, 1% Asian American, and 13% reported mixed ethnic heritage. At the time of the study, 93% of girls (aged 13–19) in the region were Caucasian (U.S. Department of Commerce, 1992). At the baseline assessment, 61% of the girls lived with single-parent families and 32% of the girls lived in families earning less than \$10,000. Analyses included the entire intent-to-treat randomized sample. All procedures were approved by the Institutional Review Board. Girls provided assent and their legal guardian provided consent for the girl to participate. There were no adverse events during the study.

### Procedure

Girls and their caregivers participated in an assessment prior to placement in out-of-home care. A multimethod, multiagent assessment approach was used, consisting of a standardized interview and questionnaires for the girl and caregiver, an interview with the caseworker, and the collection of juvenile court records. Assessments were aimed at measuring youth and family demographics, youth behaviors, and youth mental health. All interviews were conducted in person and lasted approximately 2 hrs.

### Measures: Predictors

**Sexual abuse**—A computer-based, self-administered version of the Childhood Sexual Experiences Questionnaire (Zaidi et al., 1991) was used to measure girls' self-reported sexual abuse. Girls reported whether they had experienced any of 14 sexual abuse acts (*Yes/No*). To form a measure of self-reported sexual abuse, girls' responses were summed. Sample items included being exposed to sexual parts, being asked to commit sexual acts, and having forced sexual activity. The internal consistency of the scale was acceptable ( $\alpha = .89$ ). On average, the girls reported 7 ( $SD = 4.06$ ) sexual abuse experiences, with 93% of them reporting at least one act of sexual abuse.

**Physical abuse**—The Assessing Environments Questionnaire (Knutsen, 1978) was used to measure girls' self-reported physical abuse. Girls reported whether they had experienced any of 22 physical abuse acts (*Yes/No*). Items were summed to form a total index of physical abuse. Sample items included being hit with a stick, switch, or paddle for misbehavior, receiving cuts, burns, or broken bones from a parent's discipline, and requiring medical attention for injuries caused by parents. The internal consistency of the scale was acceptable ( $\alpha = .90$ ). In our sample, 93% of the girls reported at least one act of physical abuse.

**Lifetime trauma**—The Traumatic Stress Schedule was used to assess the impact of traumatic events, the degree of loss, the scope of the event(s), the threat to life and property, and the girl's sense of blame. A continuous score of lifetime trauma was calculated (range = 0–6), with higher scores reflecting more trauma experiences. The traumatic experiences of the girls included robbery (12%), assault (45%), serious motor vehicle accident (21%), injury or property damage from a natural disaster (14%), unexpected death of a loved one (36%), and other traumatic events (76%). On average, girls had experienced 2 ( $SD = 1.24$ )

traumatic events as measured by the Traumatic Stress Schedule, with 90% of girls having experienced at least one traumatic event over the course of their lifetime.

**Internalizing symptoms**—Given the association between internalizing symptoms and substance use found in prior studies (Libby, Orton, Stover & Riggs, 2005), internalizing symptoms were included as a covariate. The Depression and Anxiety subscales from the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) were used to measure girls' internalizing symptoms. The BSI is the short form of the SCL-90R instrument that is used as an objective method of screening for psychological problems and for measuring treatment progress. The Depression and Anxiety subscales (6 items each) were administered at the baseline assessment ( $\alpha = .88$  and  $.80$ , respectively) using a 5-point Likert-type scale: 0 (not at all) to 4 (very much). Anxiety and depression symptom scores were computed as the mean of the scale items rounded to the nearest whole integer and were summed to form a measure of internalizing symptoms. The girls had moderate rates of anxiety and depression, with 19% showing clinical levels of anxiety and 23% showing clinical levels of depression.

**Arrests**—Each girl's number of criminal referrals during the 12 months prior to baseline was collected using state police records and circuit court data. Court records have been found to be reliable indicators of externalizing behavior problems (Capaldi & Patterson, 1991; Capaldi & Stoolmiller, 1999). Girls had an average of 11.88 (SD = 8.01) criminal referrals.

**Age**—Given the age variation in the sample and given that prior studies have suggested that girls who become arrested at an earlier age have less positive outcomes (Leve & Chamberlain, 2004), age was included as a covariate.

#### Measures: Outcomes

**Substance use**—Information on substance use was collected using self- and caretaker-report Interviews were conducted separately with girls and with their caretakers and covered type and frequency of substance use. Girls were asked about tobacco, marijuana, alcohol and "hard" drugs using the following format: "How often have you used \_\_\_\_\_ (substance) in the past year? " The format for caretakers was "How often has \_\_\_\_\_ (girl) used \_\_\_\_\_ (substance) in the past year? " Girls and their caretakers answered these questions according to a five-point likert scale (1=never, 2=tried once or twice, 3=occasionally, 4=1–6 times a week, 5=1 or more times a day). If either a girl or caretaker reported use of "hard" drugs, the same 5-point likert scale was used to inquire about each of the following substances: stimulants, hallucinogens, opiates, inhalents, depressants, and other hard drugs (e.g., prescription, "club" drugs). Girl and caretaker reports of substance use were averaged to produce a single girl/caretaker report of each substance used.

**Analytic Approach**—Analyses were aimed at examining the predictive value of sexual abuse, physical abuse, and other trauma experiences on girls' adolescent substance use. The sexual abuse, physical abuse, and trauma scores were used as predictors of substance use; age, pre-treatment number of arrests, and internalizing symptoms were included as covariates. Hypotheses were evaluated using structural equation path modeling (SEM) with full information maximum likelihood (FIML) estimation in the AMOS 5 program (Arbuckle, 2003). FIML permits missing data and uses all available information from observed data, including derived information about means and variances, to estimate missing portions of the covariance matrix. Compared to mean-imputation, listwise, or pairwise models, FIML provides more statistically reliable standard errors (Wothke, 2000), assuming data is missing at random (Schafer & Graham, 2002). Little's test of missingness

for all data used in the SEM models indicated that data were missing completely at random, meaning that FIML was optimal and that no bias was introduced due to missing data.

## Results

### Descriptives

Correlational analyses indicated that sexual abuse was positively associated with physical abuse, lifetime trauma, internalizing symptoms, alcohol use, marijuana use, and hard drug use. Physical abuse was positively associated with marijuana use and hard drug use. Lifetime trauma was positively associated with pretreatment arrests. Internalizing symptoms was positively associated with alcohol use. Pretreatment arrests was positively associated with age. Tobacco use, alcohol use, marijuana use, and hard drug use were all positively associated with each other. Means, standard deviations, and correlations are shown in Table 1.

### Abuse, Trauma and Rates of Tobacco, Alcohol, Marijuana, and "Hard" Drug Use

The first SEM model specified effects of sexual abuse, physical abuse, and lifetime trauma on four substance use variables: tobacco, alcohol, marijuana, and "hard" drugs. Results are shown in Figure 1 in the form of standardized path coefficients. Our hypothesis that childhood sexual abuse would be significantly related to rates of substance use during adolescence was supported. Sexual abuse was significantly related to alcohol use, marijuana use, and "hard" drug use ( $\beta = .17, p < .05$ ;  $\beta = .17, p < .05$ ;  $\beta = .18, p < .05$ , respectively). Age, pretreatment arrests, physical abuse, lifetime trauma, and internalizing symptoms were not associated with substance use outcomes. The specified model obtained excellent fit to the observed covariance data,  $\chi^2(0) = 7.22, p = 0.71$ , comparative fit index (CFI) = 1.00, root mean square error (RMSEA) = .00. The model explained 8% of the variance in hard drug use, 3% of the variance in tobacco use, 7% of the variance in marijuana use and 5% of the variance in alcohol use.

### Sexual Abuse and Rates of Hard Drug Use

Given the significant relationship between sexual abuse and the use of "hard" drugs, a second SEM model was specified to examine the relationship between sexual abuse and the six categories of "hard" drugs: stimulants, hallucinogens, opiates, inhalents, depressants, and other hard drugs (e.g., prescription, "club" drugs). Sexual abuse was significantly related to stimulant use, opiate use, and depressant use ( $\beta = .24, p < .001$ ;  $\beta = .21, p < .01$ ;  $\beta = .23, p < .01$ , respectively). Age was significantly related to "other" hard drug use. Pretreatment arrests was not associated with use of hard drugs. The specified model obtained excellent fit to the observed covariance data,  $\chi^2(2) = .48, p = 0.79$ , comparative fit index (CFI) = 1.00, root mean square error (RMSEA) = .00. The model explained 8% of the variance in stimulant use, 3% of the variance in hallucinogen use, 9% of the variance in opiate use, 3% of the variance in inhalant use, 9% of the variance in depressant use, and 5% of the variance in other hard drug use.

## Discussion

Consistent with prior research, the girls in the present study who were involved in the juvenile justice system experienced high rates of abuse and trauma, with 93 % of girls reporting having experienced sexual abuse, 93% of girls reporting having experienced physical abuse, and 90% of girls having been exposed to at least one additional childhood trauma ( $M = 2.01$ ;  $SD = 1.24$ ). Girls in the present study also were found to have a high rate of substance use, with 85.3% reporting use of tobacco, 80% reporting use of alcohol, and 79% reporting use of marijuana. In addition, girls in the present study were found to use hard

drugs at a high rate (64%), with 51% of girls reporting use of stimulants, 30% reporting use of hallucinogens, 21% reporting use of opiates, 20% reporting use of inhalents, 15% reporting use of depressants, and 11% reporting use of other hard drugs (e.g., prescription, "club" drugs). High rates of childhood abuse, trauma and substance use in this study highlight the complex co-occurring difficulties experienced by adolescent girls in the juvenile justice system.

As expected, childhood sexual abuse was significantly related to girls' substance use during adolescence. Consistent with prior research, childhood sexual abuse was significantly related to alcohol use, marijuana use, and the use of hard drugs. Surprisingly, physical abuse and lifetime trauma, were not significantly related to adolescent substance use in the present study.

The lack of association between physical abuse, lifetime trauma, and substance use is in contrast to prior research. In particular, prior research has shown a link between physical abuse, trauma experiences, and the use of alcohol and drugs among incarcerated women (Mullings, Hartley & Marquart, 2004) and among adolescents (Boyd-Bell, Manson, Noonan, & Beals, 2006). Although the reason for these lack of associations cannot be determined by the current study, there are several possibilities for these findings. One explanation might be that rates of tobacco, alcohol, marijuana, and other drug use are high among girls in the juvenile justice system in general, making it difficult to detect differences between girls with greater physical abuse and trauma experiences. Further, given the high rates of multiple forms of trauma, it might be the case that previous research that has not included multiple forms within a single model have drawn conclusions that might have otherwise been different; that is, a more detailed model allows for a greater understanding of the significance of each predictor. It also might be the case that, with the exception of a few prior studies (i.e., Lipschitz et al., 2003; Williams et al., 2008), the existing research on adolescent trauma and substance use has focused on examining either the relationship between substance use and trauma experiences or the relationship between substance use and trauma-related symptoms. Internalizing symptoms were included as a covariate in the current study, which might provide a more accurate picture of adolescent substance use among girls with co-occurring childhood abuse and trauma. And finally, it might be the case that studies conducted with adult populations do not directly transfer to adolescents, even when these populations have similar co-occurring problems (e.g., incarcerated females).

## Limitations and Conclusions

There are several limitations to the present study. First, the sample was comprised entirely of girls. As such, it is unclear whether similar processes exist for boys. Second, our models applied to a sample that was selected based on the presence of trauma and delinquency. Thus, it is unclear if similar results would be found in a prospective study of girls. Third, despite having utilized a multimethod, multiagent approach, our measures of early childhood abuse and trauma took place during a baseline assessment when girls were an average of 15 years old, resulting in a reliance on historical and retrospective reports of abuse experiences. Although this study provides some evidence that childhood sexual abuse experiences might be related to the development of later substance use, we did not test for these specific causal mechanisms in our data. Fourth, no measures of childhood neglect were included in the current study. Given that neglect and other forms of child abuse (i.e., physical and sexual abuse) often co-exist, and that prior research has shown links between childhood neglect and substance use problems (Widom, Marmorstein & White, 2006), including measures of neglect might add substantially to understanding the relationship between child abuse experiences and substance use problems. Finally, although the measure of sexual abuse was significantly related to drug and alcohol use outcomes, the amount of variance explained by

these variables was relatively low suggesting additional variables that are significant to the models. In light of these limitations, future research should aim to replicate these findings and prospectively examine developmental models on the effects of childhood trauma for girls and boys using mediation models and longitudinal study designs.

## Conclusion

Despite its limitations, findings from the present study build on prior research on the links between childhood abuse and trauma, and co-occurring problems for girls in the juvenile justice system. In particular, findings from the present study highlight distinct relationships between childhood sexual abuse and the use of alcohol, marijuana, and hard drugs. In addition to broadening understanding of the relationship between childhood abuse, trauma experiences, and adolescent substance use, these results have important clinical implications and suggest that prevention and intervention efforts with delinquent girls might benefit from comprehensive assessment and treatment of childhood sexual abuse and substance use.

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## References

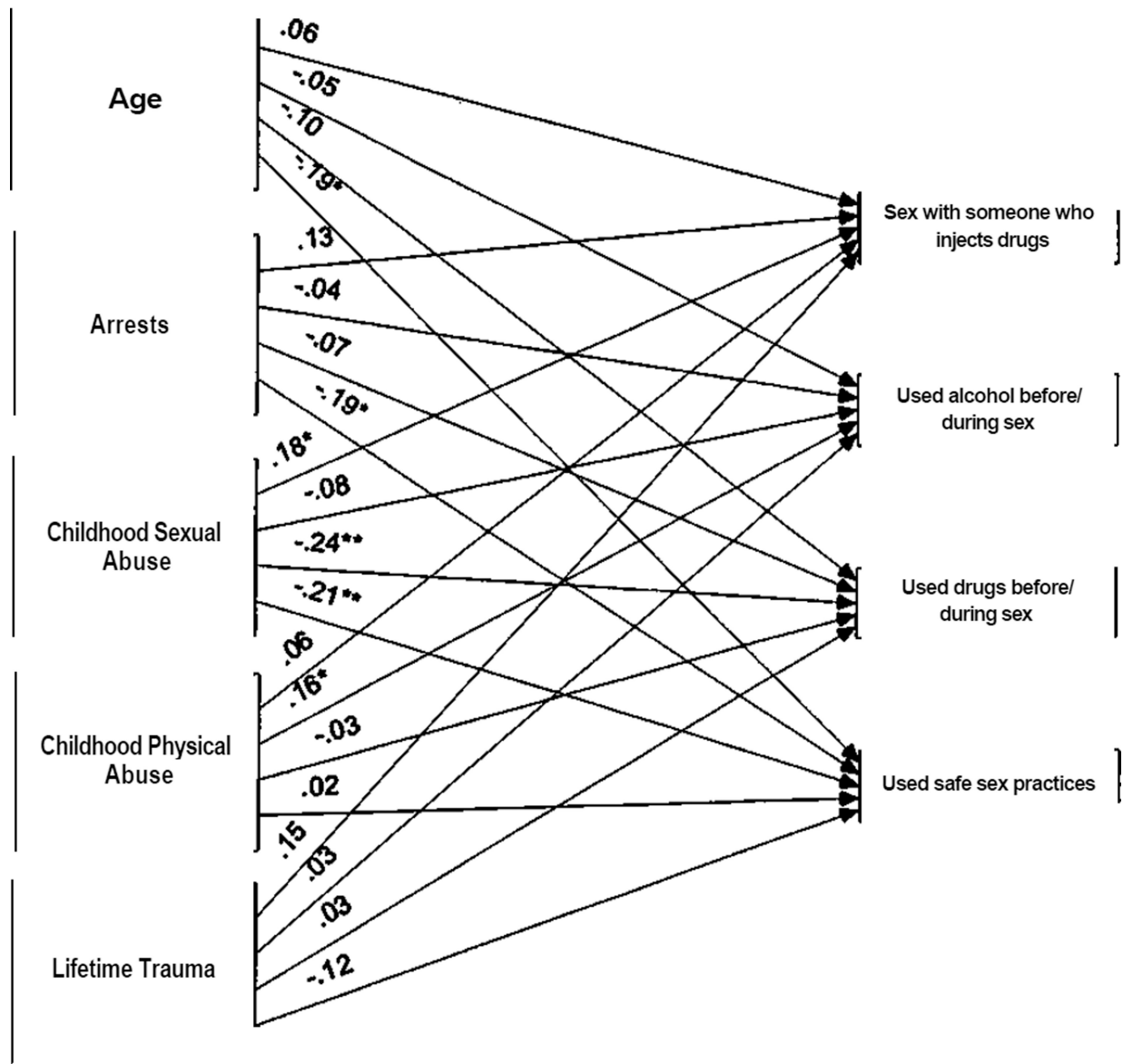
- Abram KM, Washburn JJ, Teplin LA, Emanuel KM, Romero EG, McClelland GM. Posttraumatic stress disorder and psychiatric comorbidity among detained youths. *Psychiatric Services*. 2007; 58:1311–1316. [PubMed: 17914008]
- Armstrong TD, Costello EJ. Community studies on adolescent substance use, abuse, or dependence and psychiatric comorbidity. *Journal of Consulting and Clinical Psychology*. 2002; 70:1224–1239. [PubMed: 12472299]
- Bardone AM, Moffitt TE, Caspi A, Dickson N, Silva PA. Adult mental health and social outcomes of adolescent girls with depression and conduct disorder. *Development & Psychopathology*. 1996; 8:811–829.
- Baschnagel JS, Coffey SF, Schumacher JA, Drobos DJ, Saladin ME. Relationship between PTSD symptomatology and nicotine dependence severity in crim victims. *Addictive Behaviors*. 2008
- Biglan, A.; Brennan, PA.; Foster, SL.; Holder, HD. *Helping adolescents at risk: Prevention of multiple problem behaviors*. New York: Guilford Press; 2004.
- Boyd-Bell AJ, Manson SM, Noonan C, Beals J. Traumatic events and alcohol use disorders among American Indian adolescents and young adults. *Journal of Traumatic Stress*. 2006; 19:937–947. [PubMed: 17195969]
- Brown, P.J.; Read, J.P.; Kahler, C.W. Comorbid PTSD and substance use disorders: Treatment outcomes and role of coping. In: Ouimette, P.C.; Brown, P.J., editors. *Trauma and substance abuse: Causes, consequences, and treatment of comorbid disorders*. Washington, DC: American Psychological Association; 2003. p. 171-190.
- Brown PJ, Stout RL, Gannon-Rowley J. Substance use disorder - PTSD comorbidity: Patients' perceptions of symptom interplay and treatment issues. *Journal of Substance Abuse Treatment*. 1998; 14:1–4.
- Brown TL, Henggeler SW, Brondino MJ, Pickrel SG. Trauma exposure, protective factors, and mental health functioning of substance-abusing and dependent juvenile offenders. *Journal of Emotional & Behavioral Disorders*. 1999; 7(2):94–102.
- Cauffman E, Feldman SS, Waterman J, Steiner H. Posttraumatic Stress Disorder among female juvenile offenders. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1998; 37:1209–1216.
- Deykin EY, Buka SL. Prevalence and risk factors for Posttraumatic Stress disorder among chemically dependent adolescents. *American Journal of Psychiatry*. 1997; 154:752–757. [PubMed: 9167501]



- Giordano, PC.; Cernkovich, SA.; Lowery, AR. A long-term follow-up of serious adolescent female offenders. In: Putallaz, M.; Bierman, KL., editors. *Aggression, antisocial behavior, and violence among girls: A developmental perspective*. Duke series in child development and public policy. NY: Guilford Publications; 2004. p. 186-202.
- Goldstien NE, Arnold DH, Weil J, Mesiarik CM, Peuschold D, Grisso T, Osman D. Comorbid symptoms patterns in female juvenile offenders. *International Journal of Law and Psychiatry*. 2003; 26:565–582. [PubMed: 14522226]
- Goodkind S, Ng I, Sarri RC. The impact of sexual abuse in the lives of young women involved or at risk of involvement with the juvenile justice system. *Violence Against Women*. 2006; 12:456–477. [PubMed: 16617171]
- Harrison PA, Hoffman NG, Edwall GE. Differential drug use patterns among sexually abused adolescent girls in treatment for chemic dependency. *International Journal of the Addictions*. 1989; 24:499–514. [PubMed: 2599679]
- Khantzian EJ. The self-medication hypothesis of substance use disorders: A reconsideration and recent applications. *Harvard Review of Psychiatry*. 1997; 4:231–244. [PubMed: 9385000]
- Kaysen D, Simpson T, Dillworth T, Larimer ME, Gunter C, Resnick PA. Alcohol problems and posttraumatic stress disorder in female crime victims. *Journal of Traumatic Stress*. 2006; 19:399–403. [PubMed: 16788998]
- Kilpatrick DG, Aciemo R, Saunders B, Resnick HS, Best CL, Schnurr PP. Risk factors for adolescent substance abuse and dependence: Data from a national sample. *Journal of Consulting and Clinical Psychology*. 2000; 68:19–30. [PubMed: 10710837]
- Knutson JF. Child abuse as an area of aggression research. *Journal of Pediatric Psychology*. 1978; 3:20–27.
- Lederman CS, Dakof GA, Larrea MA, Li H. Characteristics of adolescent females in juvenile detention. *International Journal of Law and Psychiatry*. 2004; 27:321–337. [PubMed: 15271527]
- Leve, LD.; Chamberlain, P. Girls in the juvenile justice system: Risk factors and clinical implications. In: Pepler, D.; Madsen, K.; Webster, C.; Levine, K., editors. *The development and treatment of girlhood aggression*. Mahway NJ: Lawrence Erlbaum Associates; 2005. p. 191-215.
- Lewis EO, Yeager CA, Cobham-Portorreal CS, Klein N, Showalter C, Anthony A. A follow-up of female delinquents: Maternal contributions to the perpetuation of deviance. *Journal of the American Academy of Child & Adolescent Psychiatry*. 1991; 30:197–201. [PubMed: 2016222]
- Lipschitz DS, Grilo CM, Fehon D, McGlashan TM, Southwick SM. Gender differences in the associations between posttraumatic stress symptoms and problematic substance use in psychiatric inpatient adolescents. *The Journal of Nervous and Mental Disease*. 2000; 188:349–356. [PubMed: 10890343]
- Lipschitz DS, Rasmusson AM, Anyan W, Gueorguieva R, Billingslea EM, Cromwell PF, Southwick SM. Posttraumatic stress disorder and substance use in inner-city adolescent girls. *The Journal of Nervous and Mental Disease*. 2003; 191:714–721. [PubMed: 14614338]
- McCord J. A forty year perspective on effects of child abuse and neglect. *Child Abuse & Neglect*. 1983; 7:265–270. [PubMed: 6686471]
- McFall ME, MacKay PW, Donovan DM. Combat-related posttraumatic stress disorder and severity of substance abuse in Vietnam veterans. *Journal of Studies on Alcohol*. 1992; 53:357–362. [PubMed: 1619930]
- Najavits LM, Weiss RD, Shaw SR. The link between substance abuse and posttraumatic disorder in women: A research review. *American Journal of Addiction*. 1997; 6:273–283.
- Read JP, Brown PJ, Kahler CW. Substance use and posttraumatic stress disorders: Symptom interplay and effects on outcome. *Addictive Behaviors*. 2004; 29:1665–1672. [PubMed: 15451135]
- Robertson AA, Dill PL, Husain J, Undesser C. Prevalence of mental illness and substance abuse disorders among incarcerated juvenile offenders in Mississippi. *Child Psychiatry and Human Development*. 2004; 35:55–74. [PubMed: 15626325]
- Ruchkiin VV, Schwab-Stone M, Kuposov R, vermeiren R, Steiner H. Violence exposure, posttraumatic stress, and personality in juvenile delinquents. *Journal of the American Academy of Adolescent Psychiatry*. 2002; 41:322–329.

- Schumacher JA, Coffey SF, Stasiewicz PR. Symptom severity, alcohol craving, and age of trauma onset in childhood and adolescent trauma survivors with comorbid alcohol dependence and posttraumatic stress disorder. *The American Journal on Addictions*. 2006; 15:422–425. [PubMed: 17182443]
- Simpson TL. childhood sexual abuse, PTSD and the functional roles of alcohol use among women drinkers. *Substance Use and Misuse*. 2003; 38:249–270. [PubMed: 12625430]
- Stevens SJ, Murphey BS, McKnight K. Traumatic stress and gender differences in relationship to substance abuse, mental health, physical health, and HTV risk behavior in a sample of adolescents enrolled in drug treatment. *Child maltreatment*. 2003; 8:46–57. [PubMed: 12568504]
- Stewart SH, Conrod PJ, Pihl RO, Dongier M. Relationship between posttraumatic stress syndrome dimensions and substance dependence in a community-recruited sample of substance-abusing women. *Psychology of Addictive Behaviors*. 1999; 13:78–88.
- Stewart SH, Pihl RO, Conrod PJ, Dongier M. Functional relationship among trauma, PTSD, and substance-related disorders. *Addictive Behaviors*. 1998; 23:797–812. [PubMed: 9801717]
- Williams JK, Smith DC, Gotman N, Sabri B, An H, Hall JA. Traumatized youth and substance abuse treatment outcomes: A longitudinal study. *Journal of Traumatic Stress*. 2008; 21:100–108. [PubMed: 18302171]

### Trauma, Delinquency, and Substance Use



Chi-Square=6.135; df=6; p=. 408; CFI= .999; cmindf=1.023

**Figure 1.** Childhood abuse, trauma and rates of tobacco, alcohol, marijuana, and "hard" drug use

**Table 1**  
Means, Standard Deviations, and Correlations Among Variables Used in Path Analyses

Variable	1	2	3	4	5	6	7	8	9	10
1. Pretreatment arrests										
2. Age	.AT									
3. Sexual abuse	.02	.05								
4. Physical abuse	-.01	.10-.01	.19*							
5. Lifetime trauma	.23**	.07	.15*	.04						
6. Internalizing symptoms	-.10	-.07	.25***	.14	-.02					
7. Tobacco use	.02	.08*	.12	.07	.07	.12				
8. Alcohol use	-.05	-.05	.16*	.05	-.01	.15*	.34***			
9. Marijuana use	.07	-.05	.22**	.26***	-.02	.04	.42***	.54***		
10. Hard drug use	.09	.12	.24***	.16*	.15	.15	.40***	.39***	.45***	
<i>M</i>	11.88	15.31	6.66	17.46	.34	103.60	4.07	3.06	2.97	2.49
<i>SD</i>	8.06	1.17	4.06	14.80	.21	20.20	1.48	1.34	1.36	1.41