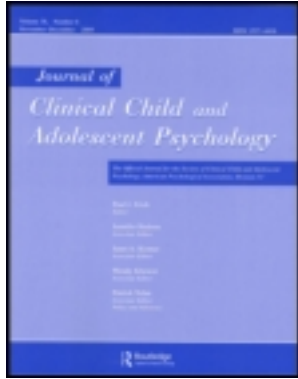


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Posttraumatic Stress Symptoms are Associated with the Frequency and Severity of Delinquency Among Detained Boys

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BRIEF REPORTS

Posttraumatic Stress Symptoms are Associated with the Frequency and Severity of Delinquency Among Detained Boys

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Trauma and posttraumatic stress symptoms increasingly are recognized as risk factors for involvement with the juvenile justice system, and detained youth evidence higher rates of trauma exposure and posttraumatic stress disorder (PTSD) compared to their nondetained peers. Using a sample of 83 detained boys aged 12 to 17, we tested the hypothesis that degree of PTSD symptomatology would be positively associated with arrest frequency and delinquency severity. Results indicated that 95% of participants had experienced trauma, and 20% met criteria for Full or Partial PTSD. As predicted, severity of PTSD symptoms was associated with degree of delinquency, and this effect remained present for the past year delinquency variables after controlling for the total number of traumas reported.

Substantial research has documented a link between traumatic exposure or posttraumatic stress disorder (PTSD) and juvenile offending. Cross-sectional and longitudinal research attests to the fact that maltreated and traumatized youth, including youth experiencing PTSD symptoms, are at increased risk for juvenile delinquency and antisocial behavior compared to their peers (e.g., Egeland, Yates, Appleyard, & van Dulmen, 2002; Mersky & Reynolds, 2007; Widom & White, 1997). A separate line of research has documented the prevalence of trauma exposure and PTSD among youth involved in the juvenile justice system (e.g., Abram et al., 2004; Ford, Hartman, Hawke, & Chapman, 2008; Kerig, Arnzen Moeddel, & Becker, 2010; Kerig, Ward,

Vanderzee, & Arnzen Moeddel, 2009). Although community estimates of PTSD among boys range from 4 to 9% (Kessler et al., 1994; Kilpatrick et al., 2003), a recent review of the literature finds that, across studies of youth in detention, as many as 32% of boys and 52% of girls report significant levels of posttraumatic symptoms (Kerig & Becker, 2011).

These studies have informed new theoretical models of the developmental psychopathology of delinquency, which suggest that trauma may act as a catalyst for some youths' involvement in the juvenile justice system (Ford, Chapman, Mack, & Pearson, 2006; Greenwald, 2002; Kerig & Becker, 2010). However, studies examining the continuum of offending among youth in the juvenile justice system are rare. Emerging research suggests the possibility that the severity of PTSD symptoms may be associated with severity of delinquency. For example, Smith, Leve, and Chamberlain (2006) reported that higher levels of PTSD symptoms may be directly linked to increased engagement with the juvenile justice system. The authors found that among 88 girls court-mandated to out-of-home treatment, severity of posttraumatic stress symptoms was associated with the

We extend appreciation to the families who participated in this study. We also thank the administrators and staff of the Butler County Juvenile Justice Center, including Thomas Barnes, Robert Clevenger, Devin Goodman, Jason Gundrum, and Sandra Spoerl, as well as research assistants Rebecca Ezechukwu, Zachary Shindorf, and Holli Sink.

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number of criminal referrals received in the past year. However, further research is needed to determine whether these findings also hold true for detained boys as well as to extend this research by investigating both the frequency of contacts with the juvenile justice system and the severity of the offenses that draw the attention of the courts. Therefore, the purpose of the present study was to test the hypothesis that, among a sample of detained boys, there would be a positive association between level of PTSD symptomatology and youth offending as measured by arrest frequency and delinquency severity.

METHOD

Participants

Participants included 83 adolescent boys remanded to the custody of a local juvenile detention center between September 2009 and May 2010. Youth ranged in age from 12 to 17 years at the time of study enrollment, with a mean age of 16 years 2 months ($SD=1$ year 4 months). Among the 83 participants, 58 (70%) were Caucasian, 20 (24%) were African American, 1 (1%) was Latino, and 4 (5%) were multiracial. The detained youth were charged with a variety of offenses, including status offenses, misdemeanors, and felonies.

Procedure

This study and all procedures were approved by both the Butler County Juvenile Justice Center (JJC) and the Miami University Human Subjects Institutional Review Board. At parent visitations to the JJC, parents of eligible youth were invited to provide signed informed consent for their child's participation. After parents provided informed consent, youth were given the opportunity to provide signed assent. No incentives were offered to either parents or youth. Of 125 parents approached, 98 (78%) provided informed consent, although two youth were released from the detention center before they could be included in the study. Of the 96 boys approached, 90 (94%) provided assent. The data from seven youth were unusable due to computer errors, resulting in a final sample of 83 participants.

Research assistants conducted all interviews in a private interview room within the JJC. All interviewers underwent extensive training in the administration and scoring of the University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index for *DSM-IV* (PTSD-RI, described next) and the application of the *Diagnostic and Statistical Manual of*

Mental Disorders (4th ed. [*DSM-IV*]; American Psychiatric Association [APA], 2000) diagnostic criteria, including the web-based training devised by the measure's developers (<http://www.ncsnet.org/nccts/asset.do?id=314>), as well as training from a master clinician who monitored and oversaw the PTSD-RI scoring.

Measures

Trauma exposure and PTSD symptoms. The PTSD-RI (Pynoos, Rodriguez, Steinberg, & Stuber, 1998; Steinberg, Brymer, Decker, & Pynoos, 2004) is a well-validated screening measure used to assess trauma exposure and PTSD symptoms. First, the PTSD-RI screens for exposure to 13 different potentially traumatic events such as war, accidents, community violence, medical trauma, and seeing a dead body. In addition, given increasing attention to relational aspects of childhood trauma (e.g., Ullman, 2007), the present study added 10 items from Goldberg and Freyd's (2006) measure that differentiate between interpersonal traumas characterized by betrayal (e.g., "Has someone you cared a lot about seriously hurt you on purpose?") versus nonbetrayal (e.g., "Has someone you didn't care a lot about seriously hurt you on purpose?"). Youth respond *yes* or *no* to whether each event has ever happened to them, and after responding to exposure items, they choose one event that they identify as the most distressing. For the most distressing event chosen, the youth is asked when the event happened and to describe what happened. Next, the interview asks questions to determine whether the identified event meets *DSM-IV* (APA, 2000) Criterion A for PTSD, which requires both an objective component whereby there was a threat to the physical self as well as a subjective experience of terror, fear, or helplessness.

Youth are also asked to rate the extent to which they have experienced symptoms of PTSD in the month prior to the interview on a Likert scale from 0 (*none of the time*) to 4 (*most of the time*), and these ratings are used to derive a continuous scale of Total PTSD symptoms. In addition, these scores are used to determine whether the youth likely meets criteria for Full or Partial PTSD. Full PTSD is defined as endorsing the necessary symptom count for all three *DSM*-defined PTSD clusters (i.e., reexperiencing, avoidance, and hyperarousal), whereas Partial PTSD is defined as meeting the necessary symptom count for two of the three PTSD clusters, with a score of 3 or 4 on the Likert scale considered indicative of symptom presence. Studies, including those involving juvenile justice-involved youth, find internal consistency of the PTSD-RI to fall in the range of .90 (Kerig et al., 2009; Steinberg et al., 2004), and Goenjian et al. (2001) reported an intraclass correlation coefficient

across 7 days of .93. Scores on the PTSD-RI are highly correlated with a diagnosis of PTSD and demonstrate high sensitivity-specificity with diagnostic PTSD interviews (see Steinberg et al., 2004). The internal consistency for the Total PTSD score in the present study was .89.

Delinquency. Based on methods developed in previous research (e.g., Capaldi & Stoolmiller, 1999; Smith et al., 2006; Wood, Foy, Layne, Pynoos, & James, 2002), official records were used to assess delinquency. Although a limitation of these records is that youth will have a record only for those crimes for which they were charged, the use of official records avoids many of the shortcomings of self-report methods and documents only those behaviors associated with actual involvement in the juvenile justice system. In the present study, both the frequency of arrests and the severity in charges were incorporated into the delinquency scores established for each participant.

Utilizing the official state judicial codes, charges were typologized into predetermined categories based on their severity (i.e., status offenses, nonviolent miscellaneous offenses, nonviolent criminal offenses, violent criminal offenses, and violent sexual offenses). Offense levels were assigned a rank-order score, ranging from a status offense (weight of 1) to a violent sexual offense (weight of 5). For example, a youth who had a record of two status offenses (each with a weight of 1) and one violent criminal offense (with a weight of 4) would have a total delinquency score of 6 (see also Wood et al., 2002). SPSS syntax based on the level of offense and the number of offenses was used to create a total score of delinquency. Four delinquency variables were created: number of lifetime arrests, lifetime delinquency severity, number of past year arrests, and past year delinquency severity.

RESULTS

Demographic Characteristics and Descriptives

The means, standard deviations, and intercorrelations of all study variables are presented in Table 1. Independent groups *t* tests were performed to compare mean differences in trauma exposure, PTSD, and delinquency variables between Caucasian and minority youth, and no differences emerged ($ps > .10$). Participant age was positively associated with total number of traumas endorsed ($r = .24, p = .03$) as well as the number of lifetime arrests ($r = .26, p = .02$).

The boys in this study had been arrested an average of 6.8 times throughout their lives and an average of 3 times in the past year. The age of participants' first offense ranged from 9 to 17, with an average age of 13.31 ($SD = 1.93$). Correlations indicated that total trauma exposure was not significantly associated with any of the delinquency variables. In contrast, the Total PTSD score was significantly associated with both the number of lifetime ($r = .26, p = .03$) and past year ($r = .29, p = .02$) arrests, as well as past year delinquency severity ($r = .26, p = .03$).

Type and Severity of Trauma Exposure

In total, 95% of the sample reported having experienced at least one adverse life experience ($n = 79$), and on average, youth reported exposure to approximately six different types of potentially traumatic event (e.g., accident, physical abuse). Regarding the experience most distressing at the time of the interview, boys in the study most frequently endorsed experiencing community violence (25.3%), domestic violence (19.3%), and witnessing community violence (19.2%). Approximately four out of every five boys in the sample ($n = 68$) identified as their most distressing event a trauma that met *DSM-IV*

TABLE 1
Means, Standard Deviations, and Intercorrelations of Study Variables

Variable	1	2	3	4	5	6	7
1. Age	—	.24*	-.02	.26*	.17	.22	.13
2. Total Trauma Exposure		—	.42***	.15	.13	.11	.14
3. PTSD-RI Total			—	.26*	.20	.29*	.26*
4. No. of Lifetime Arrests				—	.88***	.59***	.37***
5. Lifetime Delinquency Severity					—	.51***	.50***
6. No. of Past Year Arrests						—	.80***
7. Past Year Delinquency Severity							—
<i>M</i>	16.18	5.88	22.04	6.84	21.68	3.09	10.73
<i>SD</i>	1.41	3.69	11.56	5.03	14.92	2.69	8.55

Note: Age is calculated in years. PTSD-RI = Posttraumatic Stress Disorder-Reaction Index.

* $p \leq .05$. *** $p \leq .001$.

TABLE 2
Multiple Regression Models Testing for Posttraumatic Stress Symptoms as a Predictor of Past Year and Lifetime Delinquency

	<i>Lifetime Delinquency Severity</i>					<i>No. of Lifetime Arrests</i>				
	R^2	ΔR^2	ΔF	β	t	R^2	ΔR^2	ΔF	β	t
Step 1 Model Summary	.05	—	1.51			.11	—	3.84*		
Age				.17	1.36				.31	2.67**
Ethnicity				-.12	-.98				-.09	-.80
Step 2 Model Summary	.08	.04	2.70 [†]			.18	.07	5.42*		
PTSD Symptoms				.20	1.64 [†]				.27	2.33*
	<i>Past Year Delinquency Severity</i>					<i>No. of Past Year Arrests</i>				
	R^2	ΔR^2	ΔF	β	t	R^2	ΔR^2	ΔF	β	t
Step 1 Model Summary	.06	—	2.07			.13	—	4.57		
Age				.14	1.18				.33	2.92*
Ethnicity				-.19	-1.61				-.11	-.96
Step 2 Model Summary	.13	.07	5.20*			.21	.09	6.91*		
PTSD Symptoms				.27	2.28*				.29	2.63*

Note: For ethnicity, majority race = 1, minority race = 0. Beta weights reflect variables' coefficients in final model. PTSD = posttraumatic stress disorder.

[†] $p = .105$. * $p \leq .05$. ** $p \leq .01$.

(APA, 2000) Criterion A for the diagnosis of PTSD. On average, participants' most distressing traumatic event occurred 36 months ($SD = 36.75$) prior to their interview in the detention center, and the average age at which participants experienced the event was 12.79 ($SD = 3.39$). Compared to youth who experienced one traumatic event, youth who endorsed exposure to multiple events reported higher levels of PTSD symptoms, $t(66) = 1.97$, $p = .05$. In total, of the 83 youth in the sample, eight met criteria for likely Partial PTSD and eight met criteria for likely Full PTSD. Thus, approximately 20% of the sample met criteria for either likely Partial or Full PTSD.

Association Between PTSD and Delinquent Behavior

To test the hypothesis that there would be a positive relationship between level of PTSD symptoms and degree of delinquent behavior, four separate regression analyses were conducted. These analyses investigated whether PTSD symptoms were associated with number of lifetime arrests, lifetime delinquency severity, number of past year arrests, and past year delinquency severity. In the four regression models, age and ethnicity were entered first in the models as covariates, and the results of these regression analyses are presented in Table 2.

Overall, the hypothesis that PTSD symptoms would predict delinquency was supported, given that the predictive relationship was significant in three of the regression models and approached significance in the fourth model, $\Delta F(1, 63) = 6.91$, $p = .01$, for number

of past year arrests; $\Delta F(1, 63) = 5.20$, $p = .03$, for past year delinquency severity; $\Delta F(1, 63) = 5.44$, $p = .02$, for number of lifetime arrests; and $\Delta F(1, 63) = 2.70$, $p = .105$, for lifetime delinquency severity. In addition, participant age was significant associated with the number of lifetime and past year arrests. Subsequent analyses examined whether PTSD predicted delinquency above and beyond levels of trauma exposure. Although not shown, results indicated that, for the past year delinquency variables, the number of traumas reported by the youth did not predict delinquency, whereas PTSD did predict delinquency after controlling for trauma exposure, age, and ethnicity, $\Delta F(1, 62) = 3.99$, $p = .05$, for past year delinquency severity and $\Delta F(1, 62) = 4.80$, $p = .03$, for number of past year arrests. Therefore, results largely support the hypothesis that posttraumatic stress symptoms would be associated with delinquency, and this effect was still present for the past year delinquency variables even after controlling for the total number of traumas reported.

DISCUSSION

In addition to establishing that the youth in the present study experienced high rates of trauma, consistent with other investigations with juvenile justice-involved youth, the present study found that PTSD symptoms were associated with levels of delinquency. These results are noteworthy, particularly given that they provide substantiating evidence that posttraumatic symptoms are directly associated with delinquent behaviors (Smith et al., 2006).

This finding contributes to the current literature in several ways. First, although high rates of trauma exposure and PTSD have been found among delinquent youth (see Kerig & Becker, 2011, for a review), this study used official arrest records to demonstrate that there was a relationship between PTSD symptoms and both the severity of delinquency and the number of arrests in a youth's history. To date, little research has examined whether PTSD and degree of delinquency are directly associated. Second, this study utilized a sample of detained adolescent boys and thus corroborates the findings of Smith and colleagues (2006) based on an all-girl sample. Third, the present research extends the literature by providing evidence that not only do detained boys have higher prevalence rates of PTSD than their nondetained peers as has been previously reported but also the degree of posttraumatic stress is associated with the frequency and severity of boys' engagement in delinquency, both in the past year and across the boys' lifetimes. In addition, these results indicate that PTSD symptoms, rather than trauma exposure alone, are linked to offending behaviors.

Another contribution of the present study is its demonstration that the accumulation of arrests and charges is more powerful than detainment alone in explaining the link between PTSD and delinquency. For instance, whereas Wood and colleagues (2002) did not find posttraumatic symptoms to be associated with the severity of the single precipitating offense that led to the youth's detainment in their sample, the present study did find such a relationship when examining lifetime arrest histories. Therefore, although some engagement in delinquent behaviors may be common among adolescents and not necessarily related to psychopathology (e.g., Moffitt, 1993), it may be that a cumulative pattern of involvement with the juvenile justice system is associated with PTSD among traumatized delinquent youth.

The present findings also are consistent with the supposition that multiple or repeated traumas may increase the risk for engagement in delinquent behaviors. Consistent with previous research with detained samples (Abram et al., 2004; Kerig et al., 2010; Kerig et al., 2009), the majority of the participants in the present study reported exposure to several different types of potentially traumatic events. As also is evident among the youth in this study, repeated or cumulative traumas are associated with higher levels of PTSD symptoms than are single traumatic events (Briere, Kaltman, & Green, 2008; Copeland, Keller, Angold, & Costello, 2007; Scott, 2007; Suliman et al., 2009), which may set in motion a negative transactional spiral. For example, research indicates that adolescents with PTSD are more likely than their peers to have lowered self-esteem (Saigh, Yasik, Oberfield, & Halamandaris, 2008), to experience school difficulties (Lipschitz, Rasmusson,

Anyan, Cromwell, & Southwick, 2000), and to be at increased risk for drug and alcohol use or other risk-taking behaviors (Kilpatrick et al., 2000), which may draw the attention of the juvenile justice system. In addition, individuals who evidence PTSD symptoms may have deficits in recognizing, as well as maturely responding to, risky or ambiguous situations (Orcutt, Erickson, & Wolfe, 2002) and thus may be more likely than other youth not only to enter into dangerous, risky, and illegal situations but also, once caught, to fail to "make the kinds of strategic choices that would allow him/her to avoid getting entangled in the law" (Kerig & Becker, 2010, p. 49).

Although these results extend the current knowledge regarding the link between PTSD and delinquency, limitations of the present study should be noted. The data collected in this research were cross-sectional, and so no causal relationships among the variables can be presumed. As previously noted, transactional and bidirectional processes may come into play such that, although PTSD may increase the likelihood of delinquency, it is also possible that antisocial youngsters place themselves in risky situations where they are likely to be victimized and to experience subsequent posttraumatic stress (e.g., Giaconia et al., 1995; Kerig & Becker, 2010). The PTSD measure used in the present study does not include a timeline of all traumatic events aside from the event endorsed by the youth as most distressing, and information on comorbid mental health symptoms was not available. In addition, the only charges and arrests included in the present study were those incurred within the county of the juvenile detention center, and so any charges received in other jurisdictions were not included. The sample also consisted predominantly of White male subjects, and future research would benefit from greater diversity, particularly because parent presence and consent at visitation times may have limited the representativeness of the present sample of all youth in detention. Likewise, given that the sample consisted of only boys, as well as only those boys who were actually detained in a single detention center, results cannot be assumed to generalize to delinquent girls or represent all boys within the juvenile justice system.

Implications for Research, Policy, and Practice

In spite of these limitations, the present results indicate that further research is warranted to investigate the link between PTSD and delinquency. Future research would benefit from utilizing multiple informants and wider sampling procedures as well as including multiple measures to capture each construct (e.g., official arrest records, parent reports, and self-report of delinquency) and additional measures of distress and comorbid psychopathology. In addition, prospective longitudinal

research will be needed to establish the direction of effects and to investigate moderators and mediators of the relationship between posttraumatic stress and delinquency. Future research should also not only investigate the ways in which trauma may be a catalyst for anti-social behavior but also identify the protective factors that contribute to resilience among traumatized youth.

Last, these results highlight the importance of developing effective assessments and interventions for trauma and suggest that initial entry into the juvenile justice system might be a crucial time for identifying those youth who are in need of mental health services (Kerig et al., 2010). At a minimum, a thorough assessment of diverse adverse life events is warranted, and in addition to standard assessments of physical and sexual abuse, attention to frequently endorsed events such as community and domestic violence should not be overlooked or dismissed. Moreover, the results support increasing attention to the need to develop and deploy effective trauma-focused interventions for juvenile justice-involved youth (Greenwald, 2002; Kerig, in press). Given the cost to society of juvenile offenders' ongoing legal system involvement, and the potential iatrogenic effects of detention, it is important to incorporate early prevention and intervention efforts that may assist youths' desistance from delinquency and their overall well-being.

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