



The Relationship Between Trauma, Recidivism Risk, and Reoffending in Male and Female Juvenile Offenders

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Abstract

Elevated rates of traumatic experience in the juvenile justice population are well established. Nevertheless, the role of trauma and its application to rehabilitation and recidivism in a criminal justice context remains hotly debated, particularly for female youth. The Risk-Need-Responsivity framework, the predominant model for risk assessment and case management in juvenile justice, does not consider trauma to be a risk factor for offending. This study examined— Posttraumatic Stress symptomology, maltreatment history, and childhood adversity — in relation to RNR risk factors for reoffending (criminogenic needs) and recidivism in a sample of female and male juvenile offenders. Rates of PTS symptomology, maltreatment, and childhood adversity were significantly higher in this sample compared to prevalence in the general population. Females were more likely to have experienced maltreatment. Several maltreatment and childhood adversity types were significantly related to criminogenic needs. PTS symptomology and adversity were not significant predictors of recidivism when entered alongside criminogenic needs; however, maltreatment was the strongest predictor of recidivism for both male and female youth in a model that included criminogenic needs. Gender did not moderate the relationship between maltreatment and recidivism. The importance of considering youths' maltreatment history in their rehabilitative care is discussed.

Keywords Maltreatment · PTSD · Childhood adversity · Youth justice · Risk need responsivity (RNR) · Gender differences

Almost all juvenile offenders report experiencing at least one traumatic event over their lifetime (Ford et al. 2012; Wilson et al. 2013), a rate much higher than in community samples (Costello et al. 2002). Rates of Posttraumatic Stress Disorder (PTSD) (11–67%; Abram et al. 2004; Dixon et al. 2005; Moore et al. 2013), *childhood maltreatment* (40–77%; Coleman and Stewart 2010; Moore et al. 2013), and *childhood adversity* (77–95%; Baglivio et al. 2014; Wilson et al. 2013) are much higher in justice system-involved youth than in the general population (Afifi et al. 2014). These rates are two to three times higher for

female than male juvenile offenders (Coleman and Stewart 2010; Foy et al. 2012; Moore et al. 2013).

Shifting from prevalence to relationships, how the *connection* between trauma and (re)offending is conceptualized, has critical implications for policy and practice within and beyond corrections. Although trauma is clearly relevant to the lives of many justice-involved youth, it is unclear whether these trauma-related constructs are direct risk factors for reoffending in justice system-involved youth and whether the relationship between these constructs and reoffending differs for female and male youth, questions we explored in the present study.

This lack of clarity is due, at least in part, to the fact that the connection between childhood trauma — and its resultant symptoms — and later justice system involvement has been studied in distinct, and generally siloed, research literatures. Within the maltreatment literature, symptoms of PTSD (Ardino et al. 2013; Becker and Kerig 2011), experiences of childhood maltreatment (Evans and Burton 2013; Mersky et al. 2012; Smith et al. 2005) and — in addition to maltreatment — exposure to multiple forms of childhood adversity (e.g., economic hardship, parental mental illness) (Fox et al. 2015; Wolff et al. 2015) have been conceptualized as risk

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factors for offending (e.g., Widom 2017) for both male and female youth. In contrast, in the correctional psychology literature, they are not conceptualized as direct predictors of future criminal justice involvement among adjudicated adolescent offenders (Bonta and Andrews 2017). In the Risk-Need-Responsivity (RNR) framework (Andrews et al. 1990), a widely-used correctional rehabilitation model, the relationship between early trauma and later offending is accounted for by other, well-established, risk factors for offending: ‘criminogenic needs’ such as substance use, anti-social peer relationships, and pro-criminal attitudes, among others (Andrews et al. 2006). These scholars argue that studies reporting a direct link between trauma and (re)offending have failed to include these important risk factors in their analyses (Rettinger and Andrews 2010).

Differing understandings of the relationship between trauma and offending are also reflected in framings of the role of trauma in rehabilitative *interventions* in the criminal justice system. While in the maltreatment literature, trauma is viewed as both a way of understanding the causes of offending and as a primary target for treatment regardless of gender (Evans and Burton 2013; Mersky et al. 2012), in the correctional rehabilitation literature, trauma is an important consideration to the extent that it that impacts the effectiveness of interventions aimed at other proximal factors related to offending, rather than as a primary treatment target (Bonta and Andrews 2017).

The Relationship Between Trauma and Reoffending in the RNR Framework

Central to the RNR framework is the assertion that effective correctional rehabilitative service must attend to the principles of risk, need, and responsivity (Andrews et al. 1990). The Risk Principle states that the intensity of rehabilitative intervention should increase with individuals’ risk to reoffend. Risk is defined in terms of variables demonstrated across meta-analytic studies to be strong and direct predictors of re-offending (e.g., pro-criminal attitudes, antisocial peers, and personality features such as impulsivity); these are termed criminogenic needs (Bonta and Andrews 2017). If the goal of service is to reduce re-offending, criminogenic needs are the appropriate targets of programming (Need Principle). The Specific Responsivity Principle states that in order to effectively address criminogenic needs, services must be delivered in a manner that takes into account individuals’ personal characteristics and/or circumstances that impact the effectiveness of treatment (Andrews et al. 2006). As noted above, certain trauma-related factors (e.g., past neglect and abuse, mental health difficulties, and adverse living conditions) are conceptualized as specific responsivity factors that may be important to address to permit, or enhance the efficacy of, treatment of criminogenic needs (Hoge and Andrews 2011). However, to

date there is little guidance in the RNR literature around *how* specific responsivity factors should be integrated into the rehabilitation process.

RNR is a gender-neutral framework: the same criminogenic needs have been empirically established for males and females (Bonta and Andrews 2017). This approach has been criticized for not taking into account the potential differential impact of particular gender relevant factors, such as a previous history of trauma, on the offending behaviors of women (Belknap 2015; Van Voorhis et al. 2010). Nevertheless, several large scale and meta-analytic studies have demonstrated comparable predictive validity for males and females of RNR-based risk assessment tools (Andrews et al. 2012; Olver et al. 2014). However, several smaller studies have reported that juvenile risk assessment tools (in particular, the Youth Level of Service/Case Management Inventory; YLS/CMI, (Hoge and Andrews 2002) are less effective at predicting recidivism for female than male youth (Onifade et al. 2008; Schmidt et al. 2011; Vitopoulos et al. 2012). There is also evidence of differences in the salience of risk domains for males and females (Olver et al. 2014; Andrews et al. 2012). These studies suggest that while the RNR framework highlights important risk factors for re-offending for both genders, there remains a need to explore the possibility and implications of variations in relevance of specific criminogenic needs to male and female juvenile offenders.

Trauma and (Re-) Offending in the Broader Literature

In contrast to RNR’s approach to risk, gender, and reoffending, a body of scholarship – often coming from a feminist perspective (Belknap 2015; Chesney-Lind and Pasko 2013) – highlights potential *gender-specific* risk factors. These are the factors deemed unique to females, and *gender-salient* factors, identified as important factors for all but even more meaningful for females, that could have a substantial impact on outcomes for female offenders (Bloom et al. 2003; Chitsabesan and Bailey 2006). In this perspective, trauma-related factors such as mental health needs, relationship dysfunction, and abuse histories are seen as particularly relevant to the lives of female offenders (Gavazzi et al. 2006). Although emerging (Van Voorhis et al. 2010; Conrad et al. 2014), there is limited empirical evidence that these factors contribute to risk prediction for girls and women over and above established criminogenic needs (Andrews et al. 2012). However, there is a substantial literature outside the RNR context examining not only the prevalence of, but the relationships between, offending and trauma for both male and female youth that calls attention to the need for research on these phenomena that also takes into account the significant strides already made in juvenile corrections practice.

Post-Traumatic Stress Symptomology Post-traumatic stress symptomology refers to the features of PTSD as defined in the DSM-IV/V (American Psychiatric Association 2000, 2013) triggered by experiencing or witnessing one or more traumatic events, including flashbacks, nightmares, severe anxiety, and uncontrollable thoughts about the event(s). Aside from higher rates of PTSD found in both male and female juvenile offender samples, there is evidence that the severity of juveniles' PTSD symptoms is associated with degree of delinquency, even controlling for total number of traumatic events reported (Becker and Kerig 2011). Trauma experts have suggested that the DSM definition of PTSD, initially developed to describe the experiences and guide the mental health treatment of combatants returning from war, does not adequately describe the developmental impacts of exposure to sustained, repeated, or multiple 'traumatic' experiences reported by many survivors of childhood abuse (Cloitre et al. 2009). Indeed, Smith et al. (2006) found that, while meeting partial or full criteria for PTSD did not predict re-offending for female juvenile offenders, exposure to traumatic events (i.e., whether or not, how many times, and over what time period) did.

Childhood Maltreatment Childhood maltreatment includes "physical and emotional ill-treatment, sexual abuse, neglect, and exploitation that occurs to children under 18 years... that results in actual or potential harm to the child's health, development or dignity" (WHO 2016, p. 1), and would be grounds for monitoring by child welfare services. In addition to research reporting elevated rates of maltreatment history in juvenile offenders (Coleman and Stewart 2010; Abram et al. 2004; Smith et al. 2006; Moore et al. 2013), studies have also reported robust relationships between maltreatment in childhood and adolescence, and subsequent offending (Evans and Burton 2013; Mersky et al. 2012; Smith et al. 2005) for both males and females.

As noted above, a critical limitation of these studies is their lack of inclusion of established criminogenic needs alongside maltreatment variables in their predictive models. The few studies that have explored this question support the notion that maltreatment is related to offending for at least some youth. In a meta-analysis of the predictors of female youth offending that included studies of both criminogenic needs and factors proposed in the gender-responsive literature, Hubbard and Pratt (2002) found that criminogenic needs (e.g., antisocial peers) were the strongest predictors of offending but factors identified as important in the gender-responsive literature, such as histories of physical and/or sexual assault, also had modest effect sizes.

There is also evidence of multiple pathways to offending for girls and women, specifically. Reisig et al. (2006) found that an RNR-based risk assessment tool was a robust predictor of recidivism in women classified as following a 'typically

male' pathway into offending but that it did not predict recidivism in women whose pathway into the justice system was defined as 'gendered', that is, characterized by involvement with the justice system via histories of abuse and drug dependence (Daly 1994). Similarly, in a recent study of female juvenile offenders, almost half the sample followed a pathway characterized by childhood abuse while the remaining youth followed a gender-neutral pathway (Jones et al. 2014). Taken together, the research suggests that maltreatment may be a criminogenic need, at least for some offenders. However, studies of this 'gendered' pathway have typically included only female offenders; thus, it is important to examine the role of maltreatment in reoffending alongside established criminogenic needs in male, as well as female, youth.

Childhood Adversity Childhood adversity refers to the accumulation of exposure to chronic stressors in early life. Adversity typically includes experiences of maltreatment (outlined above) as well as other familial (e.g., parental mental health problems and criminality, separation from caregiver) and socioeconomic (e.g., poverty) factors, experiences of discrimination and other adverse personal experiences (i.e., witnessing or being the victim of violence by a same age peer, the sudden or violent death of a loved one, childhood illness) related to negative outcomes such as academic difficulties, poor physical and mental health, and substance abuse (Copeland et al. 2007; Dong et al. 2005; Green et al. 2010). Studies of childhood adversity have highlighted direct links between exposure to adversity and subsequent offending for both male and female juvenile offenders (Fox et al. 2015; Wolff et al. 2015), as well to subsequent PTSD and other mental health difficulties that co-occur with – but are not necessarily directly related to – offending (Becker and Kerig 2011; Wilson et al. 2013). However, these analyses have generally not included other variables known to predict reoffending. The few studies that have examined possible mediating effects, suggest negative affect and association with delinquent peers (Maschi et al. 2008) to be mediators in the relationship between early adversity and later offending, particularly for male and female non-violent offending behavior.

The goal of the present study was to elucidate the relationships between post-traumatic stress symptoms, childhood maltreatment, childhood adversity, and reoffending in a sample of justice system-involved youth. With the inclusion of a male comparison sample, we also sought to examine gender differences in these relationships to understand whether these trauma constructs merit further exploration as unique gender-specific/salient or gender-neutral criminogenic needs in juvenile justice risk assessment and case management. Beginning with descriptive analyses, we hypothesized that both female and male justice-involved youth would have significantly higher rates of maltreatment and childhood adversity exposure, as well as higher rates of post-traumatic stress symptoms,

compared to those found in the general youth population, and that female youth would have significantly higher rates than males. Next, we examined relationships between RNR criminogenic needs and the trauma variables. We expected that maltreatment and childhood adversity exposure, as well as post-traumatic stress symptomology, would be positively related to criminogenic needs. Finally, we sought to examine whether there was a direct relationship between the trauma constructs and reoffending and, if so, whether this relationship remained significant beyond the contribution of the already well-established criminogenic risk factors and whether this relationship would be moderated by gender.

Method

Participants

The sample consisted of 50 male and 50 female 13- to 19-year old ($M = 15.98$, $SD = 1.48$) youth who were ordered to a juvenile justice clinic of a mental health agency in a large urban city in Canada for assessment to assist with sentencing. Female participants represent consecutive admissions for assessments. Male participants were matched to female participants by date of assessment, age, and recidivism risk based on

their score on an empirically validated risk measure—the Youth Level of Service Inventory/Case Management Inventory (Hoge and Andrews 2002). Given that female youth represent approximately 25% of youth involved in the justice system (Malakieh 2017) and that male participants were matched to female participants in order to control for timing of assessment, age, and YLS score, our sample size was limited by the pace at which female youth were referred to the clinic. The matching of males and females across these characteristics allowed us to more meaningfully compare the impact of childhood maltreatment, adversity, and PTSD symptomology on male and female youth while controlling for possible confounding variables. In addition, this methodology allowed for enhanced internal validity of the study: RNR factors were identified prospectively through a comprehensive, consistent, multisource, multimethod assessment process unlikely to be available through regular youth justice services, thus yielding high-quality data on youth's individual RNR needs, mental health needs, and trauma-exposure histories. Only clients for whom consent was obtained to use clinical information for research purposes were included in the study; 82% of clients consented. Institutional Review Board approval for this study was obtained.

As Table 1 shows, participants were ethnically diverse. The charges precipitating their referrals for assessment included

Table 1 Demographic, criminal history, mental health, and recidivism characteristics by gender

Variables	M (<i>SD</i>)			<i>t</i>	<i>df</i>
	Males	Females	Total		
Age (years)	15.98 (1.49)	15.98(1.49)	15.98 (1.49)	.00	98
Mean number of DSM diagnoses	1.80(1.28)	2.04 (1.85)	1.92 (1.59)	−.75	98
Days to recidivism ($N = 49$)	383.00 (177.36)	455.05 (209.34)	413.90 (193.01)	−1.30	56
Variables	Percentage		%	χ^2	Φ
	Males	Female			
Percent ethnicity				1.08	.10
White	13	17	30		
Black	22	18	40		
East/West/South Asian	6	5	11		
Other	9	10	19		
Percent index offense				1.17	.11
Nonviolent	11	15	26		
Violent (nonsexual)	33	32	65		
Sexual	6	3	9		
Recidivism-yes	28	21	49	1.96	−.14
Type of recidivism ($N = 49$)				5.31	.33
Violent	2	3	5		
Non-violent	24	12	36		
Administrative	2	6	8		

Note. Male and female youth were matched for age. *DSM* Diagnostic and Statistical Manual of Mental Disorders

*= $p < .05$

nonviolent (e.g., failure to comply with probation, theft, drug related, break and enter), sexual (e.g., aggravated sexual assault, sexual assault, invitation to touching), and violent but not sexual (e.g., robbery, assault, threatening) offenses. The majority of youth (81%) were diagnosed with at least one psychiatric disorder at assessment (range = 0–7). There were no significant gender differences in ethnicity, category of index offense, rate of recidivism, age, or type of and time to recidivism in youth who did re-offend. 49% percent of the sample re-offended within a 2-year period (42% of females and 56% of males), with an average of 413 days to recidivism, similar to estimates of the broader justice-involved youth population of approximately 402 days to recidivism (Thomas et al. 2002).

Procedure

At the time of assessment, clinicians (psychologist, psychiatrist, or social worker) with five to 15 years' experience assessing juvenile offenders completed the Youth Level of Service/Case Management Inventory (YLS/CMI) (see Measures and Coding, below). They produced a report focused on mental health, criminogenic needs, and risk using information from multiple sources, including file material (e.g., criminal records, previous probation and mental health reports), interviews with the youth and collateral sources (parents, probation officers, etc.), and standardized tests and checklists. Participants' clinical charts and assessment reports were reviewed and double coded for reliability by doctoral level graduate students to gather information on demographics, offense history, charges, recidivism risk and criminogenic needs, post-traumatic stress symptoms, as well as information regarding youths' past experiences of childhood maltreatment and adversity.

Measures and Coding

Risk to Reoffend and Criminogenic Needs The Youth Level of Service/Case Management Inventory (Hoge and Andrews 2002) is a standardized instrument used to assess youths' criminogenic needs and risk to reoffend. A 42-item checklist produces a detailed survey of youth risk factors in eight domains; each item is coded as present or absent. The first domain covers the youth's criminal history and current convictions which, while a significant predictor of recidivism, is not a treatment target given its static nature. The remaining seven domains are amenable to change and therefore labelled dynamic risk factors, or criminogenic needs, including: Family Circumstances and Parenting (e.g., child-parent relationship difficulties, parental monitoring and control), Current School/ Employment Functioning (e.g., low achievement, truancy), Peer Affiliations (e.g., anti-social peers), Alcohol and Drug Use (e.g., substance use interfering with functioning), Leisure and Recreational Activities (e.g., limited involvement

in organized activities), Personality and Behavior (e.g., impulsivity, inadequate guilt feelings, verbal and physical aggression), and Antisocial Attitudes (e.g., attitudes favorable to crime). Items within each of the eight risk/criminogenic need domains are summed and the score is assigned a categorical descriptor (low, moderate, high). Across domains, items are summed to create a total risk score, which also corresponds to a risk category (low, moderate, high, or very high). The measure also contains a checklist of additional personal characteristics or experiences, distinct from the eight domains of risk/need and not used to determine risk, which highlights case management issues relevant to treatment responsiveness. The YLS/CMI possesses strong internal consistency and concurrent validity (Schmidt et al. 2005) and moderate to strong predictive validity (Olver et al. 2014). In the current sample, interrater reliability for the YLS/CMI total score was high, with correlations among clinicians ranging from .80 to .98 (average $r = .93$).

Post-Traumatic Stress The Youth Self Report (YSR; Achenbach and Rescorla 2001) assesses behavioral and emotional problems in 11–18-year-olds. Respondents rate themselves over the past 6 months on 112 items. The YSR's 14-item Post-Traumatic Stress (PTS) Problems subscale reflects experiences that may be indicative of post-traumatic stress (i.e., "I have trouble concentrating or paying attention", "I can't get my mind off of certain thoughts", "I have nightmares"); $\alpha = .85$ in the current study. Significant relationships have been reported between YSR PTS scores and self-report scales of PTSD and dissociation (Sims et al. 2005), and YSR PTS scores discriminated abused children who did and did not meet diagnostic criteria for PTSD (Ruggiero and McLeer 2000), providing evidence for the concurrent validity of the YSR PTS scale. The YSR PTS scale has also been found to have better concurrent validity than PTS scales derived from teacher or parent reports, and to be as valid as other scales specifically developed to screen for symptoms of post-traumatic stress in youth (Dongyoung et al. 2015). However, the PTS scale has shown poorer sensitivity in psychiatric than general population samples (Sims et al. 2005; Ruggiero and McLeer 2000). In the current sample, the YSR PTS scale was significantly and moderately related to the YSR Internalizing Syndrome Scale ($r = .47, p = .02$) but the relationship with the Externalizing Syndrome Scale was non-significant ($r = .18, p = .60$).

Maltreatment Exposure Participants' clinical files contained information on maltreatment exposure prior to age 16 derived from reports (e.g., criminal records, previous probation and mental health reports) and interviews with youths and collaterals (parents, probation officers, mental health workers, etc.). Five types of exposure were coded yes/no based on the Core Clinical Characteristics measure, originally a clinician-administered interview developed by the National Child

Traumatic Stress Network (Hodges et al. 2013), including sexual abuse, physical abuse, neglect, emotional/psychological abuse, and witnessed domestic violence. To be coded ‘yes’, exposure had to be supported by reports of at least one informant at time of assessment (typically the youths themselves); almost all reports were corroborated by more than one informant/source (90%) and a majority were documented by child welfare (54%). A ‘total maltreatment’ variable was calculated by summing across the five exposure types; thus, each youth received a score ranging from zero to five for this variable. Due to the retrospective nature of the data available, frequency or severity of maltreatment episodes could not be discerned. The total maltreatment variable was used as a marker of possible complexity, following the same format as the adverse childhood experience (ACE) literature (Baglivio et al. 2014; Wolff et al. 2015) research whereby categories of experienced adversities are used as a measure of cumulative adversity exposure. The five maltreatment exposure types were also included in a childhood adversity scale, but were examined on their own due to their predominance in the literature, as well as in real-world practice with regard to children/youth requiring the care of child welfare services as a result of these forms of exposure.

Childhood Adversity In addition to the five maltreatment types, 11 childhood adversity variables were coded as present/absent from assessment reports. Nine of the 11 adversity variables were derived from the National Comorbidity Survey-Revised (Green et al. 2010) to examine the relationship between childhood adversities and adult psychiatric disorders in a large national US population survey. These included three types of interpersonal loss (parental death, parental divorce, and other separation from parents or caregivers – e.g., foster care placement), four types of parental maladjustment (mental illness, substance abuse, criminality, and violence) and two other forms of adversity (life-threatening childhood physical illness and extreme childhood family economic adversity). In addition to the Green et al. (2010) variables, a ‘childhood bullying’ variable was coded on the basis of research linking early victimization by bullying to delinquent behavior in adolescence (Wong and Schonlau 2013). The final adversity item included adverse events not captured in the previous categories (e.g., experiences of sexual or serious physical assault by a same-age peer, witnessing a sudden or violent death or reporting significant emotional distress due to the death of someone other than a parent). As with the maltreatment variables, to be coded ‘yes’, exposure had to be supported by reports of at least one informant at time of assessment (typically the youths themselves). Corroboration of the individual adversity variables by multiple informants varied a great deal depending on the variable, ranging from 100% for parental death to 25% for early victimization by bullying. Given the breadth of adversities examined, consistent corroboration by multiple informants was not anticipated nor required for

inclusion. These 16 items were added to form a ‘total childhood adversity’ variable. Interrater reliability for coding of the maltreatment and childhood adversity variables was strong (Landis and Koch 1977), with a Cohen’s Kappa of .82 ($p < .001$).

Recidivism Recidivism was defined as a conviction for one or more new offenses anytime during the period after the sentencing date associated with the charge(s) that prompted the youth’s referral for assessment. Conviction data, rather than arrest data, provided a more reliable description of youths’ offending within the study period given stipulations under Canada’s Youth Criminal Justice Act emphasizing the expedient expunging of non-convictions. Furthermore, it is believed that conviction, rather than arrest data, more accurately accounts for youth belonging to marginalized communities having a greater likelihood of police involvement and arrest without subsequent conviction. A two-year fixed follow-up period from time of assessment was used to provide adequate time to elapse to collect a sample of youth who had and had not re-offending, as well as time for new offenses to be processed by both the criminal justice system and to be reflected in police criminal record databases. Data were obtained from a national police criminal record database.

Results

Question 1: Do Boys and Girls Differ in their Post-Traumatic Stress Symptoms, Maltreatment Histories, and Cumulative Childhood Adversity?

Females ($M = 12.00$, $SD = 6.20$) scored higher than males ($M = 9.00$, $SD = 4.90$), $t(91) = -2.55$, $p = .01$, $d = .26$ on the YSR PTS Problems Scale. However, the proportions of male (30%) and female (34%) youth who fell within the ‘high post-traumatic stress’ category (defined as scores falling at or above the Borderline-Clinical range) were similar, $\chi^2(1) = .15$, $p = .70$, $\Phi = .04$. Both were substantially higher than estimates in the general population of PTSD which are 3–6% (Kilpatrick et al. 2003). PTS symptoms were correlated with the number of maltreatment types for female ($r = .31$, $p = .03$) but not male ($r = -.09$, $p = .56$) youth. Although retrospective, it is of note that 28 of the 30 youth falling into the high PTS category had documented histories of exposure to one or more traumatic events. Adversity and PTS symptoms were not correlated for males or females.

When examining exposure-based measures of traumatic experience, number of maltreatment types ranged from 0 to 5 ($M = 1.2$, $SD = 1.3$); 72% of females and 50% of males had previously experienced at least one type of childhood maltreatment, much greater than even the highest estimates (32%) in the general population (Afifi et al. 2014). Girls (45%) were more likely to have experienced two or more

types of maltreatment than were boys (26%). Overall, females had experienced more types of maltreatment ($M = 1.50, SD = 1.30$) than males ($M = .96, SD = 1.20$), $t(98) = 2.01, p = .05; d = .20$. There were no significant gender differences in histories of physical abuse, neglect, and witnessing domestic violence; however, females were more likely than males to have experienced sexual abuse (15% v 4%, $\chi^2(1) = 7.86, p < .01, \Phi = 0.28$) and emotional/psychological abuse (14% v 5%, $\chi^2(1) = 5.26, p < .05, \Phi = 0.23$).

On the total childhood adversity measure, 95% of youth had experienced at least one of the 16 adversities, with females ($M = 5.30, SD = 2.50$) exposed to more types than males ($M = 4.10, SD = 2.50$), $t(98) = -2.49, p = .01, d = .24$. This rate is also much higher than that of the general population, wherein approximately 66% of people are estimated to have experienced at least one adverse event in childhood (Copeland et al. 2007). Females were more likely than males to have been separated from a caregiver (38% v 29%, $\chi^2(1) = 3.66, p < .05, \Phi = 0.19$), had a parent with mental illness (18% v 9%, $\chi^2(1) = 4.11, p < .05, \Phi = 0.20$), and been exposed to ‘other’ adversity, including victimization by a peer or witnessing death (26% v 16%, $\chi^2(1) = 4.1, p < .05, \Phi = 0.20$).

Question 2: How Are Post-Traumatic Stress Symptoms, Maltreatment Histories, and Childhood Adversity Related to Youths’ Criminogenic Needs?

There were no significant correlations between the YSR PTS problems scale and youths’ criminogenic need or total risk scores (Table 2). However, for both females and males, number of maltreatment types was positively correlated with total risk and criminogenic need scores in the domains of family and personality. Number of childhood adversities was also

correlated with total risk as well as with need scores in the domains of family, substance abuse and personality.

In terms of specific maltreatment types, using Pillai’s trace, youth who had experienced physical abuse had significantly higher scores across criminogenic need domains than youth who had not, $V = .153, F(1,99) = 2.03, p = .05$; follow up t-tests revealed significant effects in the domains of education ($t(98) = 2.01, p = .047, d = .20$), family ($t(98) = 2.08, p = .040, d = .42$) and personality ($t(98) = 2.99, p = .003, d = .29$). Comparing the total risk and criminogenic need domain scores of youth who had experienced sexual abuse and youth who had not, Pillai’s trace approached significance, $V = .14, F(2, 99) = 1.85; p = .08$; follow up t-tests revealed higher needs in the domains of substance abuse ($t(98) = 3.12, p = .002, d = .30$), family ($t(98) = 2.41, p = .02, d = .69$) and leisure ($t(98) = 2.05, p = .047, d = .20$). Youth who had experienced neglect, emotional abuse, or who had witnessed domestic violence did not differ in their criminogenic need scores from youth who had not experienced these forms of maltreatment.

In order to more closely examine the nature of the relationship between the childhood adversity scale and criminogenic risk, the childhood adversity scale was cut at the mean score of 5 to create a ‘low adversity’ and a ‘high adversity’ group. Previous literature has indicated that youth with more than four adversities in childhood are at highest risk for subsequent negative outcomes (Dong et al. 2005). Using Pillai’s trace, youth in the ‘high adversity’ group had significantly higher scores across criminogenic need domains, $V = .17, F(1,98) = 2.23; p = .03$ than their ‘low adversity’ counterparts; follow up t-tests revealed that the ‘high adversity’ group’s substance abuse domain scores ($M = 2.60, SD = 1.9$) were significantly higher than the ‘low adversity’ group’s scores ($M = 1.72, SD = 1.6$), ($t(98) = 2.32, p = .02, d = .23$).

Table 2 Correlations between age, maltreatment total, childhood adversity total, PTS symptoms total, and YLS/CMI total and domain scores

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1.Age	–	–	–	–	–	–	–	–	–	–	–	–
2.Maltreatment total	.01	–	–	–	–	–	–	–	–	–	–	–
3.Childhood adversity total	-.04	.80**	–	–	–	–	–	–	–	–	–	–
4. PTS problems scale	.13	.21*	.20	–	–	–	–	–	–	–	–	–
5. YLS/CMI total	-.22*	.17	.17	.13	–	–	–	–	–	–	–	–
6. Criminal history	.07	-.01	-.06	.09	.58**	–	–	–	–	–	–	–
7. Family problems	.01	-.30**	.33**	.10	.70**	.28*	–	–	–	–	–	–
8. Education/employment	-.22*	.11	.06	-.01	.69**	.22*	.34**	–	–	–	–	–
9. Peer relations	-.16	.02	.08	.04	.72**	.41**	.40**	.41**	–	–	–	–
10. Substance abuse	-.10	.12	.24*	.22*	.70**	.39**	.40**	.29**	.55**	–	–	–
11. Leisure/recreation	-.20*	.04	-.01	.06	.65**	.43**	.49**	.35**	.46**	.39**	–	–
12. Personality/behavior	-.32**	.23*	.21*	.14	.76**	.22*	.49**	.62**	.41**	.43**	.35**	–
13. Attitude/orientation	-.27**	.07	.04	.04	.79**	.36**	.56**	.52**	.52**	.47**	.44**	.54**

** $p < .01$, * $p < .05$

Question 3: Do Post-Traumatic Stress Symptoms, Maltreatment Histories, and Childhood Adversity Contribute to Recidivism Alongside Known Criminogenic Needs?

In a preliminary analysis, a logistic regression examining whether the total criminal risk score (along with age and gender) predicted recidivism 2 years' post-assessment was not significant, $\chi^2(3) = 4.62, p = .20$, with similar results when males and females were analyzed separately. The predictive ability of the YLS/CMI was further explored using ROC curve plotting. For the full sample, this resulted in a small effect size with an area under the curve value of 0.59 (95% CI = 0.48–0.70; $p = 0.05$).

Next, in order to examine whether post-traumatic stress symptoms, childhood maltreatment, and cumulative childhood adversity predicted reoffending when examined alongside established criminogenic needs, we tested three logistic regression models, with recidivism (yes/no) as the outcome. Gender and either post-traumatic stress symptoms (Model a), number of maltreatment types (Model b) or total childhood adversity (Model c) were entered in the first step of each model. In Step 2, the eight criminogenic need domain scores were entered. Age was not included as it was not correlated with recidivism.

Model a (post-traumatic stress symptoms) was not significant ($\chi^2(10) = 13.08, p = .22$) and contained no individual

significant predictors in either step 1 or step 2. Model b (total childhood adversity) was also non-significant ($\chi^2(10) = 13.75, p = .19$) at both steps of the model, although among the individual predictors, criminal history was significant ($B = .30$, Wald's $\chi^2 = 4.12, p = .04$) in the second step of the model. Model c, which included number of maltreatment types, was significant overall, at both step 1 ($\chi^2(2) = 5.80, p = .05$) and step 2 ($\chi^2(10) = 17.90, p = .05$); criminal history, $B = .30$, Wald's $\chi^2 = 4.12, p = .04$ and number of maltreatment types, $B = .47$, Wald's $\chi^2 = 5.42, p = .02$ emerged as significant individual predictors of recidivism in step 2 (see Table 3). The addition of the maltreatment variable to the model significantly improved the predictive ability of the overall model. The final model explained 22% (Nagelkerke R^2) of the variance in recidivism and correctly classified 71.7% of cases. Interpreting the odds ratios, wherein an $\text{exp}(B) = 1$ means no effect, $\text{exp}(B) > 1$ means that predictor increases the odds of the outcome, and $\text{exp}(B) < 1$ decreases the odds of the outcome, Table 3 shows that for each additional type of maltreatment experienced, youth were approximately 60% more likely to re-offend, while with each point increase on the criminal history score, youth were 35% more likely to re-offend. A moderated logistic regression examining the interaction between gender and number of maltreatment types was also examined ($\chi^2(11) = 21.73, p = .03$), although cautiously due to the model approaching saturation. Similar to Model c, only criminal history ($B = .35$, Wald's

Table 3 Model C: hierarchal logistic regression with gender, criminogenic domains and maltreatment total

Gender entered first as covariate								
Model variables	B	SE β	Wald's χ^2	df	p	exp(B)	CI (95%)	
							Lower	Upper
Model E								
Step 1								
Gender	.72	.43	2.80	1	0.09	2.05	0.88	4.74
Maltreatment Total	.35	.18	3.83	1	0.05	1.41	0.99	1.99
Constant	−.79	.39	4.04	1	0.04	0.45		
Step 2								
Gender	.79	.48	2.74	1	0.10	2.20	0.86	5.61
Maltreatment total	.47	.20	5.42	1	0.02	1.60	1.08	2.37
Criminal history	.30	.15	4.12	1	0.04	1.35	1.01	1.81
Family	−.02	.19	0.02	1	0.90	0.98	0.67	1.42
Education/employment	−.07	.15	0.23	1	0.63	0.93	0.69	1.26
Peer relations	.42	.25	2.77	1	0.10	1.52	0.93	2.48
Leisure	.24	.32	0.54	1	0.46	1.27	0.67	2.38
Substance abuse	−.19	.16	1.32	1	0.25	0.83	0.60	1.14
Personality/behavior	−.11	.16	0.49	1	0.49	0.90	0.66	1.22
Attitudes/orientation	.01	.20	0.01	1	0.98	1.01	0.68	1.49
Constant	−1.86	.83	5.07	1	0.02	.16		

$\chi^2 = 4.70$, $p = .03$) and a main effect of maltreatment ($B = .52$, Wald's $\chi^2 = 5.84$, $p = .02$) emerged as significant in the model and no significant interaction was found, indicating that gender did not moderate the relationship between number of maltreatment types and recidivism.

Due to the relationships found between physical and sexual abuse and youths' criminogenic needs, follow-up analyses were conducted to determine if two these forms of maltreatment, alone, might contribute to the prediction of re-offending in models containing gender and the criminogenic needs. Neither models, containing physical abuse alone ($\chi^2(10) = 15.29$, $p = .12$) or sexual abuse alone ($\chi^2(10) = 12.65$, $p = .124$), were found to be significant overall. However, in the physical abuse model, criminal history ($B = .29$, Wald's $\chi^2 = 3.83$, $p = .05$) was significant and physical abuse ($B = .89$, Wald's $\chi^2 = 3.26$, $p = .07$) approached significance.

Discussion

Trauma has consistently been posited as a gender-salient criminogenic need by scholars who advocate for a gender-specific approach to risk assessment and treatment for female juvenile offenders. While a few scholars have examined the potential contribution of trauma in the context of the Risk-Need-Responsivity framework with adult populations, this issue received scant attention with juvenile offenders. In the current study we examined: whether elevated rates of trauma-related exposure and symptomology functioned as direct predictors of reoffending or were better described as coinciding vulnerabilities in a high-risk population, their relationship to the RNR model's gender-neutral criminogenic needs, and (alongside these known criminogenic needs) whether they predicted reoffending.

Post-Traumatic Stress, Maltreatment, and Childhood Adversity

Consistent with previous literature (Becker and Kerig 2011; Coleman and Stewart 2010; Moore et al. 2013; Smith et al. 2006; Wilson et al. 2013) both male and female justice involved youth had higher rates of elevated post-traumatic stress symptomology, exposure to maltreatment, and childhood adversities than reported in the general population. Female youth were significantly more likely than male youth to have been exposed to at least one type of maltreatment and multiple types of maltreatment. Female youths' mean childhood adversity score was also significantly higher than males'. However, while the girls' scores on the PTS symptoms scale were significantly higher than the boys', the proportions of boys and girls who fell into the 'high' PTS groups were similar.

There was a lack of relationship between the *symptom*-based measure of post-traumatic stress and the two *exposure*-

based trauma measures; the only significant relationship was between number of maltreatment types and PTS scores in female youth. Explanations for this inexact relationship have included genetic vulnerability to PTSD (Gilbertson et al. 2002) and the complexity of genetic and environmental factors related to the development of mental illness in general. The pathway from exposure potentially traumatic experiences to PTSD symptomology is influenced by a myriad of biological and environmental factors such that one would not expect a strong or uniform relationship between exposure and symptom manifestation or diagnosis.

That said, childhood trauma experts have also noted that the current DSM definition of PTSD, initially developed with limited or single instances of traumatic exposure, fails to include relevant symptoms experienced by youth exposed to maltreatment and adversity over the course of development (Cloitre et al. 2009). Thus, youth exposed to frequent and prolonged maltreatment and adversity may not be flagged for trauma-related mental health issues because the current definition of PTSD is overly narrow. Given the high exposure to childhood adversity and trauma in our sample, symptoms of Complex PTSD (c-PTSD) (Herman 1992) – which includes disturbances in affective and interpersonal self-regulation, such as anxious arousal, dissociation, and aggressive or socially avoidant behaviors – rather than PTSD alone may better describe the psychological experiences of justice-involved youth who have histories of maltreatment and multiple adversities. Studies examining symptoms of exposure to trauma in juvenile offenders (Smith et al. 2006) have posited that the traditional definition of PTSD does not capture these *additional* symptoms of youth exposed to sustained maltreatment and adversity in childhood that may be more directly related to subsequent offending (Ford and Blaustein 2013) than the symptoms of traditional PTSD. Indeed, many of the behaviors associated with self-regulation vulnerabilities (e.g., dysphoria, anger) characterize a nontrivial subset of juvenile offenders and are captured within RNR criminogenic need domains.

Criminogenic Needs Related to Trauma Variables

While Post-Traumatic Stress symptoms were not correlated with youths' total risk scores, number of maltreatment types experienced was positively correlated with total risk, as well as elevated criminogenic need scores in the domains of family and personality. Number of childhood adversities was also found to be correlated with total risk, as well as with need scores in the domains of family, substance abuse and personality. Given that maltreated children are most often exposed to trauma in the family milieu, it is not surprising that number of maltreatment types was significantly related to youths' risk scores in the family criminogenic need domain. Similarly, many items making up the childhood adversity scale involved experiences directly related to parental absence, illness, or

behavior such that the relationships between this scale and the family criminogenic need domain logically follow. However, despite the relatedness of the family criminogenic need domain, childhood adversity, and maltreatment variables, they remain distinct concepts both theoretically and statistically. For instance, while the family domain of the YLS/CMI is concerned primarily with parental supervision (i.e., difficulty controlling a youth's behavior, lack of monitoring) and general relationship quality (i.e., a 'negative' relationship with mother or father), the number of maltreatment types variable captures experiences of physical, emotional/ psychological, and sexual abuse, as well as neglect and exposure to domestic violence. Thus, while connections between the presence of 'high need' on the family domain and an elevated score on the maltreatment variable are possible (and indeed likely in families where maltreatment has occurred) this relationship is not inherent to the definition of the constructs, and scores on the family domain may also be elevated in circumstances where no maltreatment has occurred.

The Contribution of Maltreatment to Reoffending

In contrast to much of the previous literature examining the YLS/CMI as a risk assessment tool, the total risk score did not predict whether youth reoffended, though it did in previous studies with similar samples (Peterson-Badali et al. 2015; Vieira et al. 2009; Vitopoulos et al. 2012). It is possible that the high prevalence of maltreatment in the current sample marks these youth as a specific sub-group of juvenile offenders for whom the links between criminogenic needs and subsequent offending are not as readily captured by the YLS/CMI. This interpretation is consistent with studies by Onifade et al. (2014) and Li et al. (2015), which found that while the YLS/CMI was a strong predictor of re-offending in non-maltreated youth, it did not predict recidivism for maltreated juvenile offenders. Youth with maltreatment histories may present with high YLS/CMI scores reflecting multiple areas of need, but may not follow the typical recidivist pathways of the broader juvenile justice population.

Maltreatment researchers have consistently reported a relationship between childhood maltreatment and justice system involvement, along with many other adverse outcomes such as illicit drug use and risky sexual behavior, in both adolescence and into adulthood (Evants and Burton 2013; Smith et al. 2005) but analyses have generally not included criminogenic needs. It is critical to understand the potential relationship of maltreatment to re-offending behavior within the context of these well-established targets of rehabilitative treatment. Regression analyses revealed that, of the three trauma variables, only the number of maltreatment types measure added predictive power to models that included criminogenic risk predictors. Interestingly, among the models, maltreatment emerged as a *stronger* predictor of recidivism than any one of

the individual YLS/CMI domains. In addition, this variable predicted reoffending for male as well as female youth, suggesting that experiencing maltreatment in childhood may be a gender-neutral criminogenic need. It may be that a portion of male offenders follow a 'typically female' (Daly 1994) pathway, marked by maltreatment in childhood, and that the impact of this history is particularly salient for juvenile offenders due to their developmental and legal reliance on others for stability, monitoring, regulation and support. These results suggest that the potential emotional, social and mental health impacts of maltreatment are an appropriate target for correctional rehabilitative intervention, alongside the other criminogenic risk domains, for male and female youth alike.

It is also notable that the maltreatment measure, but not the Post-Traumatic Stress Problems scale or the childhood adversity variable, predicted recidivism in the models tested. The tenuous connections between maltreatment exposure and resultant PTSD symptoms discussed previously, together with the notion that maltreatment may be more specifically linked to the experience of c-PTSD symptoms than the DSM definition of PTSD, raise the possibility that maltreatment contributes to risk for (re)offending insofar as it leads to self-regulation and interpersonal difficulties. Consistent with this interpretation were results indicating that the maltreatment variable, and not the symptoms measure of PTSD, was significantly related to elevated needs in the Personality/ Behavior domain of the YLS/CMI; risk in this domain includes behaviors reflecting deficits in self-regulation such as poor frustration tolerance, tantrums, as well as verbal and physical aggression. An important direction for future research is to directly investigate whether childhood maltreatment is an antecedent of these interpersonal and behavioral characteristics that are more proximally related to offending behavior. Of particular interest is an examination of both the impact of self-regulation deficits and interpersonal difficulties already captured in the YLS/CMI alongside symptoms of c-PTSD, such as pervasive mistrust and alterations in identity, that may be both the results of maltreatment and subsequent contributors to offending behavior. Finally, given the sample consisted of young people referred by the courts for comprehensive mental health assessments, it is a possibility that while the rates of exposure to different forms of maltreatment were similar to findings in the general youth justice populations, the fact that youth were referred for assessments may be a marker of the severity of their maltreatment exposure, thus potentially making it a more powerful predictor in this sample.

Practice Implications

This study is not the first to find connections between maltreatment exposure and reoffending while also finding that PTSD symptoms did not have the same predictive effect. Smith et al. (2005) found that it was the experiential measures

of trauma (i.e., maltreatment and adversity) – and not the PTSD symptom-related measures – that were the strongest predictors of adolescent re-offending in their sample of adolescent female offenders. The study's authors emphasize that their results highlight that justice-involved female youth who have been exposed to maltreatment but whose clinical symptoms do not currently fit into existing PTSD diagnostic criteria might also benefit from trauma treatment services focused on coping, emotional regulation, and interpersonal effectiveness related to their experiences of maltreatment. Our results support that this may be true for juvenile offenders regardless of gender. For instance, while not all maltreated youth experience the flashbacks associated with PTSD, working models of a hostile and threatening world and resultant difficulties in regulation of arousal, anger, and interpersonal mistrust may strongly influence their behaviors. Thus, the development and inclusion of trauma-focused interventions aimed at identifying and treating the impact of maltreatment on youth in the juvenile justice system is a worthwhile endeavour.

Given the strong relationships found between maltreatment and criminogenic need scores, there is also merit in examining experiences of maltreatment using the RNR framework's responsivity lens (Andrews et al. 2006). Indeed, the most recent iteration of the YLS/CMI includes previous maltreatment in its responsivity checklist. While we have already discussed the need for direct interventions targeting the impacts of trauma for youth with PTSD and maltreatment histories, these results suggest that within the RNR framework, these interventions may also be a means to more effectively target well-established criminogenic needs that are directly related to, or exacerbated by, experiences of past maltreatment.

In our study, exposure to maltreatment and childhood adversity were related to higher criminogenic need scores in several domains. We posit that several of the criminogenic domains such as family, personality/behavior, attitude, and substance abuse are characterized by the same deficits in self-regulation associated with the symptoms of complex PTSD linked to maltreatment in childhood. Although more research into the relationship between symptoms of c-PTSD and offending behavior is needed, trauma treatment may be an effective primary intervention with youth who have histories of maltreatment as well as high needs across the criminogenic domains. Indeed, the development of enhanced self-regulation can reduce the tendency to reflexively, rigidly, impulsively, and overemotionally or unemotionally espouse criminogenic attitudes, choose criminogenic circumstances, and engage in illegal or dangerous behaviors (Ford and Blaustein 2013). Furthermore, it has been posited that current criminogenic need-focused treatments may miss the mark by addressing an *outcome* rather than a core disturbance. For instance, substance use among trauma-impacted youth is frequently a tool for managing dysregulated emotions and physiology (Kaminer et al. 2010) but substance use treatment on its own does not target the potential underlying need for self-medication that may be

the direct result of symptoms of post-traumatic stress and previous experiences of adversity and maltreatment. Thus, trauma treatment may address many of the underlying psychological, physiological, or social difficulties that fuel high need levels across criminogenic domains. As such, the symptoms of c-PTSD that we have hypothesized to be the result of experiences of maltreatment in childhood can be understood as important responsivity factors that – if recognized, integrated into current modes of treatment, and targeted by intervention – could ameliorate youths' outcomes across a range of criminogenic need domains, resulting in a reduction of recidivism.

Limitations and Future Directions

Although all analyses met requirements for adequate statistical power, the results of the current study are somewhat constrained by a relatively small sample size that did not allow us to explore distinct models for male and female youth containing multiple predictors and effects that were found are generally small. Further research is needed to clarify the possible interaction between gender and maltreatment. Additionally, the measures of childhood trauma were obtained during a baseline assessment when youth were an average of 16 years old, resulting in a reliance on historical and retrospective reports of maltreatment experiences. As such estimates of frequency or severity of maltreatment episodes could not be measured. Cumulative maltreatment type exposure is used as a marker of possible complexity in the current study, but the findings cannot speak to the differential impact of severity or frequency of maltreatment experiences (i.e. how likelihood of re-offending is impacted by the severity versus the diversity of maltreatment exposure in childhood). The study was also limited in its measurement of post-traumatic stress symptoms to the results of a screening measure with strong concurrent validity (Dongyoung et al. 2015) but with some reports of poorer sensitivity within psychiatric populations (Ruggiero and McLeer 2000; Sims et al. 2005). As such, future studies should examine the relationship between post-traumatic stress symptoms and offending through clinician diagnostic interviews. Furthermore, given the literature on the link between childhood maltreatment and subsequent c-PTSD, as well as current findings that link maltreatment and reoffending, additional work is needed to examine, more proximally and directly, the relationship between c-PTSD symptoms and offending in justice-involved youth.

Conclusion

The well-documented elevated rates of maltreatment, cumulative adversity, and PTSD in the juvenile justice population, as well as the relationships between maltreatment,

criminogenic needs, and reoffending in this study, point to the need to integrate evidence-based, trauma-informed interventions into the practices of the juvenile justice system. In order to be effective, this should take place at multiple levels, involving probation practices, mandated treatment groups, as well as custodial programs. Education on the impact of maltreatment and trauma symptomology for service providers such as probation officers and corrections staff, the implementation of screening tools upon entry to the justice system to assist in the identification of trauma-related needs (Maschi and Schwalbe 2012), as well as enhanced cross-system collaboration (Bender 2010) between child welfare and juvenile justice such that concurrent case planning and sharing of caseloads across service sectors are facilitated, are important first steps in creating a more trauma-informed juvenile justice system.

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Compliance with Ethical Standards

Disclosure of Interest This research is based on a portion of Nina Vitopoulos' PhD thesis, submitted to the Ontario Institute of Studies in Education/University of Toronto. On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical Standards and Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation [institutional and national] and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

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