Final Technical Report

Violence Exposure, Continuous Trauma, and Repeat Offending in Female and Male Serious Adolescent Offenders

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Executive Summary

A major goal of juvenile justice reform is to reduce reoffending and recidivism among juvenile offenders (Seigle, Walsh & Weber, 2014). Reoffending rates average 30% to 60%, and here in Illinois, 50% of juvenile offenders are eventually re-incarcerated, thereby decimating their future opportunities for employment and education (Tsui, 2014). For all of the interest in reducing recidivism, there has been a lack of well-designed, prospective studies that target the group of juvenile offenders that are at the highest risk for reoffending—serious juvenile offenders (Mulvey et al., 2004). Serious offenders are more than twice as likely to reoffend than other juvenile offenders (Baglivio, Jackowski, Greenwald & Howell, 2014), and advocates of trauma informed practices assert that disproportionately high rates of violence exposure and trauma symptoms exacerbate the delinquent and violent behavior of juvenile offenders.

Although these assertions make intuitive sense, surprisingly, there is very little research examining trauma exposure and trauma symptoms as predictors of reoffending. Unfortunately, the paucity of research that exists on this topic examines the long-term effects of trauma exposure and trauma symptoms assessed during baseline interviews only. Beyond baseline interviews, juvenile offenders are often exposed to additional violence both during and after detainment, incarceration, or institutionalization (e.g., Dierkhising, Lane & Natsuaki, 2014). There is an urgent need for prospective research on serious juvenile offenders to understand both the prevalence and impact of continuous violence exposure in multiple settings on retraumatization, and subsequently on reoffending.

The current project conducted secondary data analysis on data from the Pathways to Desistance Study (Mulvey, 2004) to enhance understanding of:

1) the prevalence and longitudinal patterns of continuous trauma exposure (during and after justice involvement) and trauma symptoms in serious adolescent offenders

2) continuous trauma exposure (during and after justice involvement) in the community and in correctional settings as predictors of reoffending and post-traumatic stress disorder in serious adolescent offenders

3) how demographic factors (gender, ethnicity, and violent versus nonviolent offender status) and emotional and cognitive factors (emotion regulation, callousness, and hopelessness) impact associations between continuous trauma exposure, trauma symptoms, and reoffending.

Key findings from this study include the following:

- The majority of participants experienced continuous violence exposure as witnesses to community violence, and the rates of continuous violence exposure are lower for victimization.
- White youth and Hispanic youth were exposed to significantly higher levels of community violence, via victimization, than African American youth, and African American youth were exposed to significantly higher levels of community violence, via witnessing, than White and Hispanic youth.

- Gender differences in violence exposure were negligible, suggesting that levels of continuous community violence experienced by male and female offenders was comparable.
- Similar to community violence, a significant number of participants have been exposed to violence in correctional and residential facilities, with the prevalence of witnessing violence being higher than the prevalence of victimization.
- Latent class analysis demonstrated that there were three classes of youth based on violence exposure and trauma symptoms: Witnessed with Hostility; Dually Exposed with Anxiety and Hostility; and Not Exposed with Anxiety and Hostility.
- Almost 70% of male adolescent offenders in the current study were classified in the Dually Exposed with Anxiety and Hostility class, experiencing high levels of both witnessing and victimization at year 1.
- Latent transition analysis demonstrated that male participants with dual exposure (high levels of witnessing and victimization) at year 1 continued to show high violence exposure throughout the time points assessed.
- Latent transition analysis demonstrated that male participants with very low violence exposure at year 1 showed increasingly high levels of violence exposure throughout the time points assessed.
- Continuous community violence exposure during adolescence predicted higher levels of self-reported reoffending at all three time points assessed in early adulthood, but these associations were more consistent for male offenders than for female offenders.
- Within this sample, 68.1% of male offenders were re-arrested between year 1 and year 6, and community-level victimization during adolescence significantly increased the risk for re-arrest.
- Callous-unemotional traits and hostility symptoms significantly mediated the relationship between continuous violence exposure in adolescence and self-reported offending in early adulthood.

Understanding how continuous trauma exposure impact reoffending in serious juvenile offenders is of high priority. The cost of incarceration of juvenile offenders is estimated to be $21 billion per year (Sneed, 2014). Research that informs trauma-informed, rehabilitative care for juvenile offenders will not only decrease the societal burden of incarceration, but also increase the life chances for one of our most vulnerable populations of youth.

Background and Review of the Relevant Literature

Trauma in Justice-Involved Youth: What do we know?

Recent research demonstrates that justice-involved youth have disproportionately high levels of trauma exposure in comparison to community samples. Traumatic stressors are events that involve a threat, or the actual occurrence, of an untimely death or severe physical injury that could be life threatening or a violation of bodily integrity, and that evoke reactions of extreme fear, helplessness, or horror (American Psychiatric Association, 2000). Findings from the Northwestern Juvenile Project, a rigorous epidemiologic study of 898 female and male juvenile detainees in Cook County, Illinois, found that 93% of youth were exposed to at least one trauma, with the average number of traumas totaling 14.6 (Abram et al., 2004). Other smaller studies have shown similar findings. In a study of 350 justice-involved youth, 94% of the sample reported being exposed to at least one trauma, with an average of 5.4 (Rosenberg, Vance, Rosenberg, Wolford, Ashley & Howard, 2014). In a sample of detained male adolescents, 86.4% endorsed experiencing at least one potentially traumatic event, and 71% endorsed experiencing at least two potentially traumatic events (Stimmel, Cruise, Ford & Weiss, 2014). Findings on 658 justice-involved adolescents (i.e., detained or under community supervision by the juvenile court), demonstrated that the average number of different trauma types experienced among youth in the sample totaled 4.9 (Dierkhising et al., 2013).

Youth are exposed to various forms of traumatic stressors, but the elevated rates of trauma exposure and PTSD among juvenile offenders are largely due to violence exposure (Martin, Sinda, & Kupersmidt, 1998). Approximately 75% of justice-involved males endorse witnessing community violence, whereas 59.3% of males endorse victimization (Abram et al., 2004). A study of female and male detained youth revealed that experiencing community

violence (i.e., victimization) was the most prevalent form of trauma exposure, and witnessing community violence was the third most prevalent traumatic event (Kerig, Ward, Vanderzee, & Moeddel, 2009). Prevalence estimates of being threatened with a weapon (58%) (Abram et al. 2004), traumatic loss (48%) (Ford et al. 2008), and physical assault (35%) (Abram et al. 2004) are particularly high in detained youth compared to community samples. In fact, in a sample of detained male adolescents, the event endorsed at the highest frequency was witnessing community violence (65.2%), and of those youth who endorsed witnessing community violence, one-third identified it as the most bothersome event (Stimmel et al., 2014).

Given the extraordinarily high rates of exposure to trauma among justice-involved youth, recent research has also focused on the prevalence of PTSD symptoms, as well as the link between trauma and PTSD in this population. The rates of PTSD symptoms in justice-involved youth vary across studies due to the use of different methodological and measurement strategies (Wasserman, Ko, & McReynolds, 2004 & Wolpaw & Ford, 2004). For example, on the low end, one study found that 5% of youth detainees met all of the criteria for a PTSD diagnosis and 14% met criteria for partial PTSD (Ford et al., 2008), and another studies found that 11% of male juvenile detainees and 15% of female juvenile detainees met the criteria for a PTSD diagnosis (Abram et al., 2004). In contrast, a study showed that almost 46% of justice-involved youth met the criteria for PTSD, and youth reporting at least 5 traumas showed 8 times the probability of PTSD compared with those reporting one trauma (Roseberg et al., 2014). Another study showed that 49% of incarcerated adolescent females and 32% of incarcerated adolescent males met the criteria for PTSD (Cauffman et al., 1998). Despite the discrepancies, the average prevalence rate for PTSD in justice involved youth is 30% and even the lowest rates found in studies are 8 times higher than community samples of youth (Saigh, Yasik, Sack & Koplewicz, 1999).

Trauma in Justice-Involved Youth: What is unknown?

While the studies above provide a strong foundation for knowledge of the role of trauma in the experiences of juvenile offenders, there are a number of limitations in the current literature that restrict our understanding of how best to intervene with justice-involved youth (Mulvey et al., 2004). First, the overwhelming majority of studies in the literature focus on pretrial detainees and may not be generalizable to adjudicated youth serving sentences (Abram et al., 2004). Indeed, there is a critical knowledge gap on youth already involved in the system, particularly serious adolescent offenders, and on how to reduce reoffending in this population (Mulvey et al., 2004). Second, studies that assess the impact of traumatic stressors and trauma symptoms on outcomes in juvenile offenders often assess trauma exposure at one time point. There is very little consideration for additional trauma exposure that continues during or after initial justice system involvement. Finally, juvenile offenders are often exposed to numerous forms of traumatic stress, but there have been requests from theorists and researchers for more consideration of the role of community violence exposure in outcomes of juvenile offenders (e.g., Abram et al., 2004), especially given the strong link between community violence exposure and delinquent behavior (Wilson, Stover & Berkowitz, 2009).

Why study serious adolescent offenders? If the goal of juvenile justice is to prevent youth offenders from re-entering the system, either as juveniles or adults, juvenile offenders who commit serious, violent crimes should be targeted for intervention. Serious juvenile offenders can be conceptualized in different ways across studies, but usually refer to offenders 18-21 years old or younger who have committed serious criminal offenses, typically at the level of a felony. Serious juvenile offenders include youth who commit violent (e.g., felony assault) or non-violent crimes (e.g., drug felony). Of these two categories, youth who commit

violent offenses are at higher risk of reoffending or even becoming chronic offenders (Garrido & Morales, 2007). In general, approximately 55% of juvenile offenders are rearrested, 33% are reconvicted or readjudicated, and 12% are reincarcerated (Snyder & Sickmund, 2006). Further, figures across studies show that 30% to 60% of juvenile offenders go on to have at least one adult offense (Brame et al., 2003; Kurlychek, Brame & Bushway, 2006). In Illinois, over 50% of the juvenile offenders leaving Department of Juvenile Justice facilities are reincarcerated either in juvenile or adult facilities (Tsui, 2014). *Even more alarming, for those juvenile offenders who commit serious and violent crimes, the likelihood of reoffending more than doubles in comparison to those juvenile offenders who do not commit violent crimes (Baglivio, Jackowski, Greenwald & Howell, 2014).* Given the disproportionate rates of reoffending in serious offenders, this group drives policy and legislation related to the juvenile justice, but this group the least well understood in regards to reoffending and desistance (Mulvey et al., 2004; Mulvey et al., 2010). *The current proposal plans to address this limitation by utilizing an existing dataset (Pathways to Desistance Study) that only includes serious juvenile offenders.*

Why is it important to understand continuous trauma exposure? While most research on the impact of trauma exposure examines the long-term effects of trauma exposure and trauma symptoms assessed during baseline interviews, *juvenile offenders are often exposed to additional violence both during and after detainment, incarceration, or institutionalization* (e.g., Dierkhising, Lane & Natsuaki, 2014). There is an urgent need for prospective research on serious juvenile offenders to understand both the prevalence and impact of continuous violence exposure in multiple settings on retraumatization, and subsequently on reoffending. Given the risk of ongoing violence exposure, continuous traumatic stress theory provides a more contextually-relevant framework for serious violent offenders. Continuous traumatic stress

(CTS) is a concept originally developed to describe youth in South Africa who had experienced ongoing trauma under apartheid and its violent aftermath that incorporates the political and sociological constraints that intersect with living amongst continuous trauma (Straker, 1987, Straker & Moosa, 1994; Roach, 2013; Eagle & Kaminer, 2013). CTS recognizes that for many individuals, trauma exposure is both current and likely anticipated in the future, as opposed to existing only in the past (Eagle & Kaminer, 2013). Instead of typical symptoms of posttraumatic stress disorder that may present as an anxiety disorder in the form of avoidance, re-experiencing, and hyperarousal, these youth living in environments of ongoing exposure to trauma often exhibit symptoms of anger, aggression, and callousness (Roach, 2013). Most conceptualizations of trauma only include anger and hostility as associated or secondary features of the core diagnostic features of trauma reactions (van der Kolk, McFarlane, & Weisaeth, 1996) despite the fact that, in these communities, anger and aggression may serve as empowering alternatives to fear and a constant state of hypervigilance (Hamber & Lewis, 1997; Roach, 2013).

How does CTS relate to the experiences of serious offenders? Research demonstrates that the perception of violence as being exciting, or appetitive aggression, may in fact be psychologically protective for youth living in high-violence communities (Weierstall et al., 2013). In addition to likely being victims of violence, *youth experiencing CTS are also often perpetrators of violence and are likely overrepresented in the criminal justice system* (Roach, 2013). Further, for youth in criminal justice facilities, a readiness for quick aggression is an adaptive and valuable quality (Roach, 2013), and these settings may be serving to perpetuate these coping strategies. Unfortunately, however, larger society, law enforcement, and the courts, are often not sympathetic of these young men who perpetrate violence in response to violence they are exposed to in their neighborhood, as compared to men who experience violence in more socially-

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sanctioned ways (e.g., military service; Roach, 2013). In sum, although they are exposed to repeated violence exposure over time and continuous trauma predicts more violent behavior (Dierkhising et al., 2014), the experience of continuous trauma exposure in serious juvenile offenders is not well-understood. *The current proposal will address this limitation by examining the effects violence exposure assessed in the Pathways study at multiple time points during and after offenders' initial contact with the justice system.*

The inclusion of CTS in research on serious juvenile offenders requires consideration of the types of traumatic stressors to which youth may be exposed. For serious juvenile offenders, the likelihood of being exposed to traumatic violence in the community increases as they enter mid- to late adolescence, and their contact with the juvenile justice system increases the risk of exposure to traumatic stressors in juvenile justice institutions. *Thus, the current proposal focuses on exposure to trauma in the community and in correctional institutions.* The inclusion of these two forms of trauma exposure are consistent with recent research demonstrating strong links between exposure to institutional violence and exposure to community violence in justice populations (Byrne & Stowell, 2007).

Exposure to traumatic violence in the community. Community violence is categorized as an uncontrollable traumatic stressor. Traumatic stressors are events that involve a threat, or the actual occurrence, of an untimely death or severe physical injury that could be life threatening or a violation of bodily integrity, and that evoke reactions of extreme fear, helplessness, or horror (American Psychiatric Association, 2000). For adolescents, community violence exposure that is frequent and chronic, includes victimization, or results in the loss of family members and friends, has detrimental effects on long-term functioning (Cook et al., 2005; Ford, Chapman, Connor & Cruise, 2012).

Community violence exposure is salient for serious juvenile offenders for a number of reasons. First, as noted above, community violence exposure is one of the most frequent forms of violence to which juvenile offenders are exposed (Abram et al., 2004; Kerig et al., 2009), and a number of offenders identify community violence as their most bothersome traumatic experience (Stimmel et al., 2014). Second, unlike other forms of violence, such as child maltreatment, there are no societal-level mechanisms in place to protect youth from community violence or "remove" them from settings of high community violence, leaving them with fewer options for coping with exposure to community violence. Further, community violence exposure is strongly linked to both PTSD symptoms and violent or delinquent behavior (Fowler et al., 2009; Gaylord-Harden, So, Bai, Henry & Tolan, 2016; Wilson et al., 2009), heightening the risk for both retraumatization and reoffending in juvenile offenders who are victimized or witness other being victimized in the community after initial justice involvement. Recidivism among juvenile offenders is concentrated in specific neighborhoods and different types of neighborhoods produce, not only different rates of offending, but different types of offenses (Harris & Mengers, 2011). For example, communities with well-organized drug markets increase the chances of recidivism by commission of drug-related offenses. Likewise, communities with high levels of violence, increase the chances of recidivism by commission of violent offenses or gun-related offenses. As such, when assessing continuous trauma exposure, community violence exposure is a critical form of violence to assess for justice-involved youth.

Exposure to trauma in correctional settings. In addition, juvenile offenders may experience trauma during detainment, incarceration, and institutionalization. There are various forms of prevention methods that are used with juvenile offenders in the justice system. In particular, punitive prevention focuses on using the threat of punishment to discourage criminal

acts, and mechanical prevention is based on physically preventing an offense by installing locks on doors, bars on windows, security alarms, guards and other similar options (McMasters, 2015). While juvenile offenders are supposed to be a protected population, harsh penalties are often imposed on young offenders and a high level of abuse has been reported in the literature and the media (Lambie & Randell, 2013). More heinous actions, particularly for female offenders, such as being taken advantage of by guards or violated by staff or other youths also occur (Quinn, Poirier, & Garfinkel, 2005; Ford et al., 2016). One study found that a majority of youth report directly experiencing abuse, witnessing the abuse of others, and vicariously experiencing abuse by hearing about it from others (Dierkhising, Lane, & Natsuaki, 2014). In fact, one third of participants (34.4%) reported physical abuse by a staff member (Dierkhising et al., 2014). As a result of this hostile environment, misconduct often occurs and can lead to solitary confinement or isolation. Despite research demonstrating that solitary confinement is linked to agitation, post-traumatic stress disorder, depression, and future criminal activity (Birckhead, 2015; Simkins, Beyer, & Geis, 2012), as well as hypersensitivity to stimuli, aggression, and paranoia (Haney, 2003; Simkins, Beyer, & Geis, 2012), justice-involved youth are still often placed in isolation.

These practices within correctional settings, such as use of restraints, being subdued by staff members, or placement in more restrictive facilities, place juvenile offenders at risk for retraumatization once they have entered the justice system (Ford, Kerig, Desai, & Feierman, 2016), especially offenders with histories of trauma (Birckhead, 2015). This retraumatization is exacerbated by a "lack of shared understanding" between traumatic health specialists and the juvenile justice system as to how trauma can shape delinquency and need for mental health care (Ko et al., 2008). As such, incarceration can limit the potential for other rehabilitative options

that can directly address contextual factors that contribute to and maintain behaviors that lead to reoffending.

Potential Moderators and Mediators

A critical question for understanding risk and potential prevention opportunities concern who is at-risk to experience reoffending over time. Although serious juvenile offenders are at higher risk for reoffending than other youth, the majority do not reoffend Lussier, McCuish & Corrado, 2015; Mulvey et al., 2004). Knowledge of potential vulnerability and protective factors would be helpful for the development and enhancement of trauma informed programs to reduce reoffending (Costello et al., 2008). Overall, the examination of mediators and moderators in the proposed study is guided by dynamic developmental theory, which acknowledges the transactional associations between traumatic stressors, PTSD, and delinquency over time (Kerig & Becker, 2012).

Emotion-related variables as mediators of trauma exposure and reoffending. An understanding how individual emotion-related factors (i.e., emotion regulation, emotional reactivity/callousness) may explain the risk of reoffending in response to trauma exposure will yield information about malleable processes that can be targeted to maximize the efficacy/effectiveness of trauma-informed practices. To understand vulnerability and protection in serious juvenile offenders exposed to continuous trauma, the examination of mediators is informed by the trauma coping theory (Ford et al., 2006), an integrative model that posits that delinquent behavior is a means of coping with the overwhelming assault to the self that comprises trauma. In an attempt to gain a sense of control and compensation for their traumatic experiences, traumatized youth may adopt ways of coping characterized by maladaptive emotional and cognitive processes that lead to additional delinquent behavior.

Emotion regulation and reactivity/callousness. For adolescent offenders who are exposed to trauma, difficulties regulating emotion may be the pathway that leads to delinquent and aggressive behavior (Allwood & Bell, 2008; Pappagallo et al. 2004). Although each youth's experience of trauma stressors is unique, emotion dysregulation in traumatized youths can take the form of extreme and overwhelming disturbing emotions, such as fear, anger, and hyperarousal (Ford, 2002; Ford et al., 2006). Likewise, offenders who have experienced trauma can also develop a lack of emotion or learned emotional detachment as a method of self-protection that results in a callous presentation (Bennet & Kerig, 2014). Youth who display this acquired callousness possess the capacity for a full range of emotions, but their responsivity to others is inhibited by attempts to suppress their own posttraumatic reactions. For juvenile offenders, this emotion regulation, whether in the form uncontrolled anger and fear or in the form of callousness, leads to behavioral dyscontrol, such as violent aggression, poor impulse control and self-destructive behaviors. For juvenile offenders who have returned to the community, these problematic behaviors place them at heightened risk for continued violence exposure, and thus reoffending. Among incarcerated or institutionalized juvenile offenders, the problematic behaviors that result in emotional dysregulation may lead to segregation from the general population, increased time incarcerated and lack of access to rehabilitative services. Thus, emotion regulation and reactivity may be important elements to target in trauma-informed practices with juvenile offenders.

Participant variables as moderators of trauma exposure on reoffending. Given the variability in outcomes even for serious offenders (Mulvey et al., 2004), the identification of participant variables as risk factors will help to identify serious offenders who are at heightened risk for reoffending in response to trauma exposure and, thus, should be targeted for intervention.

Questions regarding the moderating effects of participant variables are informed by a unified model of desistance, which encompasses the combination of population heterogeneity and state-dependent processes (Lussier et al., 2015). *The Pathways to Desistance study provides a unique opportunity to examine racial/ethnic and gender differences, given the heterogeneity of the sample of serious offenders.*

Gender. The past decade has seen an upsurge in research on female offenders (Kerig & Becker, 2012). Although male detainees are significantly more likely than female detainees to have experienced violence (with the exception of sexual assault; Baglivio et al., 2014; Ford et al., 2008), most studies show that female detainees are just as likely (Abram et al., 2004) or more likely to have PTSD as male detainees (Dierkhising et al., 2013; Kerig, Moeddel & Becker, 2011; Kerig, Ward, Vanderzee & Moeddel, 2009). Further, female offenders with PTSD were found to be more likely reoffend than male offenders with PTSD (Becker, Kerig, Lim & Ezechukwu, 2012). Gender paradox theory suggests that, although female adolescents have lower rates of offending, their presentation in while in the justice system is more severe, and recent research supports the theory by showing that female offenders experience more behavioral and emotional problems, including PTSD (Krabbendam, 2016). In turn, they may be at heightened risk for reoffending if exposed to additional trauma.

Race/Ethnicity. Although ethnic group differences in reoffending vary across studies, Latino offenders report more traumatic neglect or loss and witnessing of community violence (Ford et al., 2008). Latino offenders were also found to be more likely than African American and White offenders to have PTSD, and African American offenders were more likely than White offenders to have PTSD (Teplin et al., 2012). However, African American offenders with PTSD were found to be more likely to reoffend than were their peers (Becker et al., 2012).

Examining the effects of race/ethnicity on variables in the proposed study will address the lack of research on Latino/Hispanic youth and provide crucial information regarding the vulnerability status of each racial/ethnic group, with implications for tailoring intervention efforts.

Offender status (Violent vs. Non-violent). Historically, there has been a lack of differentiation between violent and nonviolent offenders in many studies (Johnson-Reid, 1998). Recent research suggests that adolescents engaged in violent offenses are more likely to have justice involvement and to reoffend (e.g., Fontaine, Lacourse, Vitaro & Tremblay, 2014); whereas other research suggests negligible difference in reoffenses (e.g., Lai, Zeng & Chu, 2016). However, given the different needs of violent versus nonviolent offenders (Lai et al., 2016), continued research on the differentiation between the two groups is warranted. The identification of serious offenders at heightened risk for reoffending (i.e., violent offenders) may inform selective prevention programs that are tailored to this subgroup.

Research Questions and Objectives

In sum, the literature reviewed above suggests that serious and violent juvenile offenders are at higher risk for reoffending, and exposure to continuous traumatic stressors and subsequent PTSD symptoms may heighten the risk for reoffending. Based on the literature review, the specific goals and research questions of the proposed project are as follows:

Goal 1: To examine the prevalence and longitudinal patterns of continuous trauma exposure (during and after justice involvement) in serious adolescent offenders.

Research question 1a. What is the prevalence of continuous exposure to trauma in the community in serious adolescent offenders?

Research question 1b. What is the prevalence of exposure to trauma in correctional settings in serious adolescent offenders?

Research question 1c. Do rates of trauma-related symptoms change over time in response to changes in continuous violence exposure?

Goal 2: To examine continuous trauma exposure in middle to late adolescence (during and after justice involvement) as predictors of PTSD symptoms and reoffending in early adulthood.

Research question 2a. Does continuous exposure to community violence during adolescence predict PTSD symptoms and reoffending in early adulthood?

Research question 2b. Do trauma symptoms mediate the longitudinal association between continuous community violence exposure during adolescence and reoffending in early adulthood?

Research question 2c. Do trauma symptoms mediate the longitudinal association between continuous community violence exposure during adolescence and PTSD symptoms in early adulthood?

Goal 3: To examine emotional processes (emotion regulation and callousness/emotion reactivity) as mediators of the association of continuous violence exposure during adolescence to PTSD symptoms and reoffending in early adulthood.

Research question 3a. Does emotion regulation mediate the longitudinal association of continuous violence exposure to PTSD diagnosis and symptoms?

Research question 3b. Does emotion regulation mediate the association of continuous violence exposure to reoffending?

Research question 3c. Does callousness/emotion reactivity mediate the association of continuous violence exposure to PTSD diagnosis and symptoms?

Research question 3d. Does callousness/emotion reactivity mediate the association of continuous violence exposure to reoffending?

Goal 4: To examine the moderating effects of participant gender, participant ethnicity and offender status (violent versus nonviolent offending).

      Research question 4a. Do the associations between continuous trauma exposure, PTSD symptoms and reoffending differ for males and female offenders?

      Research question 4b. Do the associations between continuous trauma exposure, PTSD symptoms and reoffending differ for African American, Latino, and White offenders?

      Research question 4c. Do the associations between continuous trauma exposure, PTSD symptoms and reoffending differ for violent and nonviolent offenders?

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Study Methods

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Study Design and Methods

      Recruitment. The sample for the current study is comprised of participants in the Pathways to Desistance Study (Schubert et al., 2004), a comprehensive longitudinal study of serious adolescent offenders in Philadelphia and Phoenix. The multi-site study followed juvenile offenders as they moved through the juvenile justice system and into adulthood while evaluating developmental and psychosocial factors that may contribute to engagement in or desistance from antisocial behaviors. Youth were eligible for the study if they were between the ages of 14 and 17 and had been found guilty of a serious criminal offense. These criminal offenses were almost exclusively felonies, with a few exceptions for some misdemeanor property offenses, sexual assaults, or weapons offenses. Court records were reviewed to determine eligibility for enrollment. Enrollment of male drug offenders was intentionally limited and only comprised 15% of participants in order to prevent over-representation of this population. This cap did not apply to those adolescents transferred to the adult criminal system or to female offenders. Recruitment occurred from November 2000 through January 2003 in the juvenile court system in

Maricopa County (Phoenix), AZ, or Philadelphia County, PA; a total of 1,354 (48 percent from Maricopa and 52 percent from Philadelphia) youths were enrolled into the study. Of those eligible for participation, 67% of approached youth were consented and participated in the study.

Participants. The study enrolled a total of 1,354 adjudicated adolescents who were between the ages of 14 and 17 years at the time of their committing offense from the juvenile and adult court systems in Philadelphia, Pennsylvania, and Phoenix, Arizona. The mean age of participants at the time of the baseline interview was 15.9 (SD = 1.4). The full sample included 86% male adolescents and 14% female adolescents. The sample is ethnically diverse, with 20% Caucasian, 41% African American, 33.5% Latino youth, and 5% youth of "other ethnicity." Eighteen percent of the sample had its study index petition processed in the adult criminal system. Pathways participants had, on average, three (SD = 2.1) petitions to court prior to the baseline interview, but for 437 individuals (32%), the study index petition was their first petition to court. The study index petition represented a felony assault or felony weapon charge (including robbery) for 39% of enrolled youth, followed by a drug felony (18%), burglary (15%), major property felony (10%), felonies not part I (7%), murder/rape/arson (7%), or another less serious charge (4%). Data from baseline and the first 6 annual (12 month) time points will be utilized in the proposed analyses to capture the adolescent and emerging adulthood developmental periods.

Procedure. At the baseline assessment, parental consent was obtained for all youth under 18 years of age and youth assent was provided for all participating youth over 18. After providing informed consent, youth completed two types of interviews after their baseline interview: "time point" interviews and "release" interviews. Participants completed a series of ten interviews ("time-point interviews") that occurred at 6-month intervals for the first 3 years

and yearly thereafter through 7 years. These interviews included a standard set of measures that inquired about the adolescents' behavior and life experiences during the prior 6 months or year. Specifically, the time-point interviews assessed status and change across multiple domains, such as individual functioning, psychosocial development and attitudes, family and community context, and relationships. The date for each of the time point interviews was calculated based on the date of the baseline interview, ensuring approximately equal measurement periods for all participants. These equal measurement periods simplify the statistical analyses required to assess developmental processes, environmental changes, and their relations to changes in behavior. A portion of the time point interview used a life calendar approach (Caspi et al., 1996) to capture the nature, number, and timing of important changes in the life circumstances of these youth, which was one of the major goals of the study.

The second type of interview completed by research participants after their baseline was a "release interview." A release interview was completed following any stay at a residential facility. These interviews obtain the adolescents' reports of the services received and their perceptions of the environment experienced in institutional care. All interviews were completed by using a computer-assisted format and were conducted in the participant's home, a facility (if in residential placement at the time), or a public place (e.g., local library). To encourage honesty, attempts were made to conduct the interviews out of the hearing range of other individuals. If other individuals were within hearing distance, respondents were given the option to enter their responses on a keypad without answering verbally. Participants also were informed of the confidentiality protections provided to the study by a U.S. Department of Justice statute governing this type of funded research. On average, interviews took 2 hours to complete, and participants were paid for their participation. Additional information was obtained from official

record information (e.g. court treatment records, FBI arrest records, child welfare histories, and state Medicaid services records).

Availability and Quality of Data Source

Attrition. The Pathways to Desistance Study experienced tremendous success in tracking and assessing study participants across the ten waves of interviews. *Time-point retention rate* measures the success in completing a particular interview wave given the number of enrolled cases that are eligible to complete that time-point interview. The time-point retention rates indicated that Pathways interviewed an average of 90% of participants at each wave, with an average of 92% from the 6-month interview point to the 36-month interview point, and an average of 87% from the 48-month interview point to the 84-month interview point. Table 1 presents the time point retention rates. The *cumulative retention rate* reflects the completeness of the data and calculates the proportion of possible interviews that were completed for an individual across all time points. Of the entire sample, 63% have self-report data at all 10 waves of data collection. As further evidence of the success in retaining participants in the study, in waves 1 – 6, the overwhelming majority (86%) have self-report data at no less than 8 out of a possible total of 10 assessments. Forty-eight subjects (3.5%) died in the course of the seven-year follow-up period and 46 (3.2%) dropped out of the study of their own accord.

Representativeness. The participation rate for the Pathways study, defined as the number of participants enrolled divided by the number attempted for enrollment, was 67%. The refusal rate for the study, defined as the number of adolescents or parents who would not take part in the study divided by the number we approached, is 20%. These figures compare quite favorably with those from other studies of high-risk populations. Given the cap of 15% on drug charges, the impact of enrollment criteria and recruiting on the representativeness of the sample

was examined. Comparisons of the adjudicated, but not enrolled group (n=2,443) to the enrolled group (n=1,354) demonstrated that the enrolled group was younger at their adjudication hearing, had more prior petitions, and appeared in court for the first time at an earlier age. Further, the proportion of girls in the enrolled group was larger than the proportion of girls in the adjudicated, but not enrolled group. Given that the PI's purposefully sought to enroll youth with more serious crimes and every possible female offender, the differences between the enrolled and not enrolled youth were anticipated. Finally, participant refusal rates did not differ across racial groups. However, there were significantly more White offenders ($p < .005$) in the enrolled group versus the adjudicated, but not enrolled group, and significantly fewer African American offenders ($p < .005$) in the enrolled group versus the adjudicated, but not enrolled, group. The differences are likely due to the cap on the proportion of the sample adjudicated on drug charges given that African Americans were significantly more likely ($p = .001$) to be in the drug cap group than were other ethnic groups.

Reliability between sources of information. There was close correspondence between collateral reports of delinquency and court information (e.g., Baskin & Sommers, 2015), as well as correspondence between youth self-report of offending and court records (e.g., Brame, Fagan, Piquero, Schubert & Steinberg, 2004).

Data Collection and Data Processing Procedures

The Pathways to Desistance data are accessible online via the National Addiction and HIV Data Archive Program (NAHDAP) at the following web address: http://www.icpsr.umich.edu/icpsrweb/NAHDAP/series/00260. The NAHDAP is hosted by the Inter-university Consortium for Political and Social Research (ICPSR) at the University of Michigan's Institute for Social Research. The adolescent self-report data and codebook are

available to the general public and were downloaded by the PI from NAHDAP at the following web address: http://www.icpsr.umich.edu/icpsrweb/NAHDAP/studies/29961. The official arrest records, life calendar data, and release interviews are restricted and available only to Ph.D. level researchers through ICPSR's restricted data access system. To obtain these data, the PI completed an online application for access to restricted data and provided the following information: a Restricted Data Use Agreement, a project description, IRB approval, approved security plan for the data, roster of research and IT staff who can access the data, and confidentiality pledges for all individuals on the roster.

Analytical Techniques and Findings

Results for Goal 1

Goal 1 sought to examine the prevalence and longitudinal patterns of continuous trauma exposure (during and after justice involvement) in serious adolescent offenders through three research questions. *Research question 1a* examined the prevalence of continuous exposure to trauma in the community in serious adolescent offenders during the first three years of the study to capture exposure across adolescence. *Research question 1b* examined the prevalence of exposure to trauma in correctional settings in serious adolescent offenders. Finally, *Research question 1c* examined how levels of trauma symptoms change over time in response to changes in continuous violence exposure? Data were collected every six months during the first three years of the study providing six time points of data on violence exposure during adolescence.

Research question 1a. Consistent with procedures used in Menard and Huizinga (2001), we examined the **cumulative prevalence of continuous witnessing and victimization**, which indicates whether an individual witnessed community violence or was victimized in any one or more of the time points examined. Witnessing or being victimized at more than one time point

indicates continuous exposure to violence. Of the 1,352 participants included in the preliminary

analyses, 83% witnessed community violence at more than one time point across the six time

points analyzed, and 43% of the participants were victimized in the community at more than one

time point. The number of years participants witnessed community violence ranged from 0 to 6

(mean = 2.19, SD = 1.61). The number of years participants were victimized in the community

ranged from 0 to 4 (mean = 0.68, SD = 0.91). We also examined the **prevalence of continuous,**

multiple witnessing and victimization, which indicates the number of years an individual

witnessed or was a victim of violence multiple times in a time point (Menard & Huizinga, 2001).

Of the 1,352 participants, 39% witnessed violence more than once in more than one time point,

and 4% were victimized more than once in more than one time point. The mean number of times

individuals witnessed community violence across the six time points was 5.08 (SD = 4.80), and

the mean number of times individuals were victimized across the six time points was 1.04 (SD =

1.64).

We also examined ethnic differences in witnessing and victimization of violence. Results

from a one-way ANOVA revealed that at Year 1, White youth (M = .36, SD = .47) and Hispanic

youth (M = .30, SD = .46) were more likely to report victimization than African American youth

(M = .19, SD = .40), $F(3, 1212)$ = 6.58, $p < .001$. In Year 3, African American youth (M = .60,

SD = .49) and Other youth (M = .69, SD = .50) were more likely to report witnessing community

violence than White youth (M =.45, SD = .50), $F(3, 1190)$ = 8.86, $p < .001$). As well, in Year 3,

African American youth (M = .60, SD = .49) were more likely to report witnessing violence than

Hispanic youth (M = .47, SD = .50), $F(3, 1190)$ = 8.86, $p < .001$).

Results for male participants. The mean number of years male participants witnessed

community violence was 1.65 (SD = 1.02), and the average number of years male participants

were victimized in the community was 0.61 ($SD = .80$). Of the 1,170 male participants, 29% witnessed community violence at one time point, 31% witnessed violence at two time points, and 25% witnessed violence at three time points. In addition, 30% of male participants were victimized in the community at one time point, 11% were victimized at two time points, and 3% were victimized at three time points. We also examined the prevalence of continuous, multiple witnessing and victimization, which indicates the number of years an individual witnessed or was a victim of violence multiple times in a time point (Menard & Huizinga, 2001). Of the 1,170 male participants, 56% witnessed violence more than once in at least one time point, with 20% witnessing violence more than once in more than one time point. Also, 18% were victimized more than once in at least one time point, with 3% being victimized more than once in more than one time point. The mean number of times individuals witnessed community violence across the three time points ranged from 0 to 27, with a mean of 5.48 ($SD = 5.20$), and the mean number of times individuals were victimized across the three time points ranged from 0 to 12, with a mean of 1.11 ($SD = 1.83$). At year 1, African American male participants ($M = .19$, $SD = .39$) were less likely to report victimization than White ($M = .33$, $SD = .47$) and Hispanic male participants ($M = .33$, $SD = .47$), $F(3, 1044) = 8.34$, $p < .001$). At year 3, Hispanic male participants ($M = .48$, $SD = .50$) were less likely to report witnessing violence than African American ($M = .60$, $SD = .49$) and Other male participants ($M = .70$, $SD = .47$), $F(3, 1018) = 5.43$, $p = .001$). There no differences across racial/ethnic groups on the number of years participants witnessed violence or were victimized.

  Results for female participants. The mean number of years female participants witnessed community violence was 1.39 ($SD = 1.06$), and the average number of years female participants were victimized in the community was 0.44 ($SD = .64$). Of the 184 female participants, 26%

witnessed community violence at one time point, 30% witnessed violence at two time points, and 18% witnessed violence at three time points. In addition, 28% of female participants were victimized in the community at one time point and 8% were victimized at two time points. We also examined the prevalence of continuous, multiple witnessing and victimization, which indicates the number of years an individual witnessed or was a victim of violence multiple times in a time point (Menard & Huizinga, 2001). Of the 184 female participants, 48% witnessed violence more than once in at least one time point, with 19% witnessing violence more than once in more than one time point. Also, 13% were victimized more than once in at least one time point, with 1% being victimized more than once in more than one time point. The mean number of times individuals witnessed community violence across the three time points ranged from 0 to 31, with a mean of 4.13 ($SD = 4.92$), and the mean number of times individuals were victimized across the three time points ranged from 0 to 12, with a mean of .76 ($SD = 1.50$). At Year 3, African American ($M = .60$, $SD = .49$) youth were more likely to report witnessing than White ($M = .25$, $SD = .44$), $F(3,168) = 5.70$, $p = .001$). There were no differences in victimization across ethnic groups in Years 1 through 3.

Research question 1b. To examine the prevalence of exposure to trauma in correctional settings in serious adolescent offenders, descriptive analyses were conducted with data collected from release interviews. We were unable to examine continuous exposure to trauma in correctional settings because this information was only collected during a participant's release interview which does not provide data at multiple time points over time. The prevalence of institutional exposure to violence was examined based on release interview data. A total of 1,130 unique cases were examined based on reports at release from 679 unique participants. Participants' number of release interviews completed ranged from 1-8. Ages at release interview

ranged from 14-25 (M = 19.48, SD = 2.32). Release interviews were conducted from both the Philadelphia (40.4% of release interviews) and Phoenix (59.6% of release interviews) site locations. The vast majority of release interviews were completed by males (93.2%), with some being completed by females (6.8%). Release interviews were completed by White (21.5%), African American (34.1%), Native American (3.5%), Hispanic (39.5%), and Other (1.5%) participants. A modified version of the Exposure to Violence Inventory (ETV; Selner-O'Hagan, Kindlon, Buka, Raudenbush, & Earls, 1998) was used to assess the number of items of violence exposure endorsed by categories based on the victims and perpetrators. This measure included total scores for witnessed violence-resident to resident, witnessed violence-staff to resident, victim violence-staff to subject, victim violence, resident to subject, self-report violence-subject to resident, self-report violence-subject to staff, total witnessed violence score, total victim violence score, and a total self-report violence score.

Results for prevalence of violence exposure and victimization show that 75% of cases analyzed reported at least one incidence of witnessed resident on resident violence, while only 16.8% of cases reported one or more incidence of resident to subject violence. Prevalence rates for staff perpetrated violence showed 32.4% of cases involved one or more incident of witnessed staff to resident violence, and 9% involved staff to subject violence. For subject perpetrated violence, 21.8% of release cases indicated one or more self-reported victimizations of other residents, and 6.5% indicated one or more violent acts perpetrated against staff members. In addition to violence exposure, subjects also reported on sanctioning practices at the institutions in which they were held. Practices such as strip searches, being beaten by staff, being physically restrained, and being put in isolation were measured. Data from release interviews indicated that 50.8% of stays in a detention facility involved being strip-searched at least once, with 15.4% of

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stays involving being searched once every few months, and 5.2% involving being searched daily. Being beaten by staff was endorsed in 4.7% of release interviews and being physically restrained was endorsed in 23.6% of release interviews. Being put in isolation was endorsed in 37.7% of release interviews. Release interviews indicated an average of 0.14 (SD = 1.2) times being beaten by staff, 2.07 (SD = 30) times being physically restrained, and 2.17 (SD = 9.7) times being put in isolation per stay.

Research question 1c. The analyses for research question 1c, examining the longitudinal associations between trauma exposure and trauma symptoms, were limited to male participants, as the number of female participants is too small for the statistical approach, latent transition analysis, being utilized. Latent Transition Analysis (LTA) is a person-centered longitudinal modeling approach that is used to assess change in participants' group membership over time. One important benefit of LTA to study community violence exposure is that the PI will be able to examine both continuous exposure to violence and continuous trauma symptoms simultaneously.

The first step of LTA is to determine the baseline model using a latent class analysis (LCA). In order to determine the optimal number of latent classes for LCA, likelihood ratio tests cannot be used to make comparisons, and therefore the Akaike Information Criterion (AIC; Akaike, 1987), Bayesian Information Criterion (BIC; Schwartz, 1978), Adjusted BIC (ABIC; Sclove, 1987), entropy (Ramaswamy, DeSarbo, Reibstein, & Robinson, 1993), and the Bootstrapped Lo-Mendel-Rubin likelihood ratio (BLRM LR; McLachlan & Peel, 2000) tests were used to determine the number of latent classes. In the case of the AIC, BIC, and ABIC, lower observed values indicate better model fit. Additionally, entropy is a measure of model fit with values closer to 1.00 suggesting better model fit. Finally, a nonsignificant p value for the

BLMR LR test indicates that the model with the (K-1)-class model is preferred to the model with K classes. Research suggests that the BLRM LR as the best discriminator of classes in LCA models (Nylund, Asprouhov, & Muthen, 2007). Therefore, the final classes were determined by small AIC, BIC, and ABIC values comparing each class (K) with each K-1 classes as well as nonsignificant BLRM LR values.

Using the previously described information criteria, six LCA models with different number of latent classes were estimated sequentially using 7.3 (Muthén & Muthén, 2015). At each time point, a 3-class LCA solution suggested the best fit to the data based on the BIC, and entropy values, LMR and BLRT. When the number of latent classes was increased from three to four classes, the p value of the BLMR LR test was not statistically significant (p = .09), indicating that the addition of a fourth class did not significantly improve the fit of the model.

At T1 and T2, the three-class solution had a higher BIC than a two-class solution, but the three-class solution showed the highest entropy and a significant p value for the LMR and BLRT. In addition, nonsignificant LMR and BLRT-accompanying p-values for the four-class solution identified the three-class model as the upper limit of complexity for the profile-group structure to be extracted at T1 and T2. A more complex picture emerged for T3. At T3, the three-class solution showed a lower BIC than both the two-class solution and four-class solution. In addition, the three-class solution showed a higher entropy than all other solutions and a significant p value for the LMR and BLRT. While the entropy values decreased substantially in the four-class and five-class solutions (in comparison to the three-class solution), the LMR and BLRT-accompanying p-values for the four-class and five-class solutions were significant, suggesting the five-class model as the upper limit of complexity for the profile-group structure to

be extracted. As such, the three-class solution was retained at each time point. See Table 2 for fit indices.

Conditional item probabilities at each of the three time points were fairly similar, especially T1 and T2, suggesting that the meaning of the classes remained relatively consistent across the three time points. Participants were classified into the following classes: Witnessed with Hostility; Dually Exposed with Anger and Hostility; Not Exposed with Anger and Hostility. See Table 3 and Figure 1 for conditional item probabilities. The participants in the Witnessed with Hostility class had a high probability of witnessing community violence and experiencing symptoms of hostility during the time point assessed. However, it should be noted that participants in the Witnessed with Hostility class had an estimated probability of .46 of reporting witnessing community violence at T1, but this probability increased to 1.00 at T2 then decreased to .23 at T3. The participants classified in the Dually Exposed with Anger and Hostility class had a high probability of reporting both witnessing community violence and experiencing anxiety and hostility. In the Dually Exposed with Anger and Hostility class, participants also had a high estimated probability of being victims of violence, but the estimated probability of endorsing community victimization (.31 - .43) was lower than the estimated probability of endorsing witnessing community violence (.88 – 1.00). The overwhelming majority of participants classified in the Not Exposed with Anger and Hostility had a high estimated probability of experiencing symptoms of anxiety and hostility, but had a low probability of reporting witnessing or being a victim of community violence.

After selecting and validating separate measurement models for T1, T2, and T3, the models were compared cross-sectionally to establish whether similar classes were emerging at each time point and whether any of the changes in class size over time. The sizes of the classes

also remained relatively consistent over time. The Dually Exposed with Anger and Hostility class was the largest at each of the three time points, but decreased from 68% at T1 to 54% at T2, and 52% at T3. The Not Exposed with Anger and Hostility comprised 26% of the sample at T1, and increased to 39% at T2 and T3. The Witnessed with Hostility class was the smallest at each time point (6%, 7%, and 9%, respectively).

Next, an LCA for T1 with covariates was conducted to explore which demographic characteristics described participants in each class to further validate and contextualize the measurement model. To address the concern that inclusion of the covariates might affect the latent-class formation, we employed the bias-adjusted 3-step method of modeling with auxiliary variables (Asparouhov & Muthén, 2014), specifying the covariates as predictors of the latent class. Participants in each T1 class were compared based on the following characteristics: age at baseline, race/ethnicity, age at first offense, proportion of violent offenses at baseline, and exposure to community violence at baseline. The participants in each of the three classes did not differ on age at baseline, race/ethnicity, or age at first offense. However, participants in the dually exposed with anger and hostility class reported significantly more lifetime community violence exposure at baseline than the witnessed with hostility class (p = .02) and the not exposed with anger and hostility (p < .05). The participants in the dually exposed with anger and hostility class reported more violent offending at baseline than participants in the not exposed with anger and hostility class, but this difference was marginal (p = .07).

The next step in the analyses was to use latent transition analysis to examine whether participants remained in the same class at each time point or transitioned from one class to another. Based on the findings that the LCAs were similar at each time point, we investigated the assumption of measurement invariance for the indicators of latent class across time. To test

the assumption of full measurement invariance, two LTA models were fit without covariates, one where all of the measurement parameters were freely estimated across time and another where all of the measurement parameters for each class was held invariant across time. The results indicated a significant decrease in fit by assuming measurement invariance across time ($c^2_{(diff)}$ = 312.07, df = 27, p < .05), suggesting that the three classes cannot be considered the same across the three time points. As a result, partial measurement variance was imposed by constraining some of the measurement parameters across time, while the rest are unconstrained (Nylund, 2007). We constrained each individual parameter and compared each constrained model to the model where all of the measurement parameters for freely estimated. The LTA model was then fit again without covariates and constraining only the parameters from individual models that did not differ significantly from the unconstrained model. The remaining individual parameters, those from individual models that were significantly different from the unconstrained model, were freely estimated in this LTA model.

For the final LTA model, the probability of membership in the same latent status from year 1 to year 2 was highest for the dually exposed with anxiety and hostility class (.76 between year 1 and year 2). In other words, the dually exposed class showed the most stability from year 1 to year 2. Both the witnessing with hostility class and the not exposed with anxiety and hostility class were marked by high instability, with the witnessing class showing a .75 probability of transitioning to the not exposed class from year 1 to year 2, and the not exposed class showing a .73 probability of transitioning to the witnessing class from year 1 to year 2. The probability of membership in the same latent status from year 2 to year 3 was highest for the not exposed with anxiety and hostility class (.80 between year 2 and year 3). Again, the witnessing with hostility class showed high instability with a .63 probability of transitioning to the dual

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exposure class from year 2 to year 3. The dually exposed with anxiety and hostility class showed the highest instability from year 2 to year 3, a .77 probability of transitioning to the witnessing class.

Results for Goal 2

Goal 2 sought to examine continuous trauma exposure in middle to late adolescence (during and after justice involvement) as predictors of PTSD symptoms and reoffending in early adulthood through two research questions. *Research question 2a* examined continuous exposure to community violence during adolescence as a predictor of PTSD symptoms and reoffending in early adulthood. *Research question 2b* examined anxiety and hostility symptoms as mediators of the longitudinal association between community violence exposure during adolescence and reoffending in early adulthood. *Research question 2c* examined anxiety and hostility symptoms as mediators of the longitudinal association between community violence exposure during adolescence and PTSD symptoms in early adulthood.

Research question 2a: Reoffending as an outcome. The questions for reoffending were examined using both regression analysis and survival analysis. For regression analysis, we examined the associations between chronic witnessing, chronic victimization, multiple witnessing, and multiple victimizations in Years 1-3 and reoffending in Years 4, 5, and 6 while controlling for gender, ethnicity, age, baseline age at first offense, and baseline offending. Results from multiple regression analyses revealed that continuous witnessing in Years 1-3 was significantly associated with reoffending in Years 4, 5, and 6 (Year 4: B=.181, $p < .001$; Year 5: B=.117, $p < .001$; Year 6: $B = .154$, $p < .001$). Continuous victimization in Years 1-3 was significantly associated with reoffending in Years 4, 5, and 6 (Year 4: $B = .227$, $p < .001$; Year 5: $B = .188$, $p < .001$; Year 6: $B = .183$, $p < .001$). Multiple continuous witnessing in Years 1-3 was

significantly associated with reoffending in Years 4, 5 and 6 (Year 4: $B = .130$, $p < .001$; Year 5: $B = .099$, $p = .001$; Year 6: $B = .101$, $p = .001$). Additionally, multiple continuous victimization was significantly associated with reoffending in Years 4, 5, and 6 (Year 4: $B = .214$, $p < .001$, Year 5, $B = .121$, $p < .001$; Year 6: $B = .179$, $p < .001$).

For males, multiple regression analyses revealed that multiple witnessing in Years 1 through 3 significantly predicted reoffending at Year 4 (B = .122, p<.001), Year 5 (B = .103, p = .001), and Year 6 (B = .099, p = .002), when controlling for baseline age, ethnicity, age at first offense, and baseline aggressive offending. Further, chronic witnessing in years 1 through 3 were predictive of reoffending in Years 4 through 6 when controlling for baseline age, ethnicity, age at first offense and baseline aggressive offending (Year 4: B = .184, p < .001; Year 5: B = .129, p < .001; Year 6: B = .157, p < .001). Multiple regression analyses also revealed that, for males, multiple victimization at years 1 through 3 significantly predicted reoffending at Years 4 through 6 (Year 4: B = .223, p < .001; Year 5: B = .138, p < .001; Year 6: B = .194, p < .001) when controlling for baseline age, ethnicity, age at first offense, and baseline aggressive offending. In addition, chronic victimization in years 1 through 3 was predictive of reoffending at Years 4 through 6 (Year 4: B = .237, p < .001; Year 5: B = .208, p < .001; Year 6: B = .195, p < .001).

For females, multiple regression analyses revealed that multiple witnessing in Years 1-3 significantly predicted reoffending at Years 4 ($B = .229$, $p = .003$) and 6 ($B = .162$, $p = .035$), but not Year 5 ($B = .085$, $p = .274$). Multiple witnessing in Years 1-3 significantly predicted reoffending in Year 4 ($B = .160$; $p = .042$), but not in Years 5 ($B = -.063$, $p = .433$) and 6 ($B = .068$, $p = .391$). Analyses also revealed that, for females, chronic witnessing in Years 1-3 was significantly associated with reoffending at Year 4 ($B = .181$, $p = .017$) and 6 ($B = .170$, $p =$

.028), but not with reoffending at year 5 ($B = .024$, $p = .764$). Further, chronic victimization in Years 1-3 was not predictive of reoffending in Year 4 ($B = .144$, $p = .059$), Year 5 ($B = -.083$, $p = .291$), or Year 6 ($B = .068$, $p = .383$).

The current study also utilized survival analyses to model time until re-arrest in a sample of juvenile justice involved youth. Survival analysis is a statistical method that describes patterns of event occurrence and risk for the occurrence of an event (Singer & Willett, 2003). The current study utilized a variable of re-arrest that was coded dichotomously to indicate whether or not the participant was arrested during each 6 month period from the 12 month time point to the 84 month time point. This variable was then right-centered and a discrete-time survival analysis was conducted in Mplus Version 7 (Muthen & Muthen, 2012).

Survival analyses were restricted to include male participants only due to an insufficient number of female participants for the analytic approach. At the 12 month data collection, 581 boys had yet to be re-arrested and thus were utilized in the current analyses. These youth ranged in age from 15 to 20 years old ($M = 16.07$, $SD = 1.17$) at the 12 month data collection. This subset of participants self-identified as 21.3% White, 43.2% Black, 30.6% Latino, and 4.8% Other. Within this sample, 68.1% of youth were re-arrested between the 12 month and 84 month follow-ups. In the model, age, race/ethnicity, lifetime violent offending, anxiety symptoms, hostility symptoms, community violence victimization, and witnessing community violence were used as simultaneous predictors of the discrete re-arrest variable. The results of the analyses indicated that increased age ($b = -0.11$, $SE = 0.05$, $p = 0.02$), increased violence victimization ($b = 0.39$, $SE = 0.08$, $p < .001$), and increased lifetime violent offending ($b = 0.54$, $SE = 0.26$, $p = 0.04$) increased the risk for re-arrest. All other variables in the model were not significant predictors of re-arrest. Of note, when lifetime community violence exposure was added as an

additional covariate, age (b = -0.13, SE = 0.05, p = 0.01) and 12-month victimization (b = 0.39, SE = 0.09, p < .001) continued to significantly predict re-arrests, but lifetime violent offenses was no longer a significant predictor (p = 0.53). See Table 4 for parameter estimates.

Research question 2a: PTSD as an outcome. We also examined the association between chronic witnessing, chronic victimization, multiple witnessing, and multiple victimization in Years 1-3 with PTSD symptoms or a PTSD diagnosis at 72 months while controlling for baseline age, gender ethnicity, baseline age of first offense and baseline reoffending. Results from multiple regressions revealed that multiple witnessing, multiple victimization, chronic witnessing, and chronic victimization were not significantly associated with PTSD symptoms at 72 months (multiple witnessing $B = -.032$, $p = .275$; multiple victimization: $B = .049$, $p = .090$; chronic witnessing: $B = -.017$, $p = .561$; chronic victimization: $B = .053$, $p = .080$). As well, multiple witnessing, multiple victimization, chronic witnessing, and chronic victimization were not significantly associated with a PTSD diagnosis at 72 months (multiple witnessing: $B = -.039$, $p = .194$; multiple victimization: $B=.038$, $p=.194$; chronic witnessing: $B = -.014$, $p = .634$; chronic victimization: $B = .019$, $p = .518$).

For males, multiple regression analyses revealed that neither multiple witnessing nor multiple victimization at Years 1-3 was not predictive of PTSD symptoms (multiple witnessing: $B=-.016$, $p=.622$; multiple victimization: $B = .053$, $p = .094$). Further, neither chronic witnessing nor chronic victimization in Years 1-3 were associated with PTSD symptoms at 72 months (chronic witnessing: $B = -.006$, $p = .841$; chronic victimization: $B = .062$, $p = .056$). As well, we observed that multiple witnessing, multiple victimization, chronic witnessing, and chronic victimization were not predictive of participant PTSD symptoms at 72 months when controlling for baseline age, ethnicity, age at first offense, and baseline offending (multiple witnessing: $B = -$

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.004, p = .896; multiple victimization B = .029, p = .359; chronic witnessing: B = .015, p = .647; chronic victimization: B = .023, p = .483).

For females, results from multiple regressions revealed that multiple witnessing, multiple victimization, chronic witnessing, and chronic victimization in Years 1-3 were not predictive of PTSD symptoms at 72 months (multiple witnessing: b = -.102, p = .195; multiple victimization: B =. 033, p = .687; chronic witnessing: B = -.054, p = .498; chronic victimization: B = .000, p = .996). We also observed that multiple witnessing was significantly associated with a PTSD diagnosis at 72 months (B = -.192, p = .014). However, multiple victimization, chronic witnessing, and chronic victimization at years 1-3 were not significantly associated with PTSD diagnoses at 72 months (multiple victimization: B = .103, p = .210; chronic witnessing: B = -.137, p = .085; chronic victimization B = .001, p = .988).

Research question 2b. Symptoms of anxiety and hostility as measured by the BSI at 48 months were used to reflect trauma symptoms and were tested as mediators in the relationship between continuous violence exposure and future aggressive offending at 60 and 72 months. With anxiety as a mediator, all forms of continuous violence exposure showed significant direct effects with greater violence witnessing and violence victimization predicting increased offending at 60 months (cumulative witnessed violence: b = .003, p < .001; chronic witnessed violence: b = .008, p < .05; multiple witnessed violence: b = .012, p < .01; cumulative victimization: b = .009, p < .001; chronic victimization: b = .022, p < .001; multiple victimization: b = .020, p < .01) and 72 months (cumulative witnessed violence: b = .003, p < .001; chronic witnessed violence: b = .012, p < .001; multiple witnessed violence: b = .011, p < .01; cumulative victimization: b = .007, p < .001; chronic victimization: b = .017, p < .001; multiple victimization: b = .022, p < .001). Anxiety did not mediate the relationship between

continuous violence exposure and later offending at 60 months (cumulative witnessed violence: $B = .010$, CI: -.002-.024; chronic witnessed violence: $B = .005$, CI: -.002-.014; multiple witnessed violence: $B = .007$, CI: -.002-.017; cumulative victimization: $B = .009$, CI: -.001-.026; chronic victimization: $B = .011$, CI: -.002-.027, multiple victimization: $B = .008$, CI: -.001-.022) or 72 months (cumulative witnessed violence: $B = -.004$, CI: -.013-.006; chronic witnessed violence: $B = -.001$, CI: -.006-.004; multiple witnessed violence: $B = -.0003$, CI: -.006-.006; cumulative victimization: $B = -.003$, CI: -.012-.005; chronic victimization: $B = -.004$, CI: -.014-.006; multiple victimization: $B = -.002$, CI: -.009-.005).

With hostility as a mediator, increased witnessed violence and victimization measures again showed direct effects, with more violence exposure being associated with increased aggressive offending at 60 months (cumulative witnessed violence: $b = .003$, $p < .0001$; chronic witnessed violence: $b = .008$, $p < .05$; multiple witnessed violence: $b = .012$, $p < .01$; cumulative victimization: $b = .009$, $p < .001$; chronic victimization: $b = .021$, $p < .001$; multiple victimization: $b = .020$, $p < .01$) and 72 months (cumulative witnessed violence: $b = .003$, $p < .001$; chronic witnessed violence: $b = .011$, $p < .001$; multiple witnessed violence: $b = .011$, $p < .01$; cumulative victimization: $b = .007$, $p < .001$; chronic victimization: $b = .016$, $p < .001$; multiple victimization: $b = .021$, $p < .01$). Results indicated that hostility was consistently a significant mediator in the relationship between all measures of continuous violence exposure and future aggressive offending at 60 months (cumulative witnessed violence: $B = .016$, CI: .003-.034; chronic witnessed violence: $B = .012$, CI: .002-.027; multiple witnessed violence: $B = .012$, CI: .002-.026; cumulative victimization: $B = .015$, CI: .003-.034; chronic victimization: $B = .018$, CI: .003-.039; multiple victimization: $B = .012$, CI: .002-.028). However, hostility did not mediate the relationship between continuous violence exposure and aggressive offending at 72

months (cumulative witnessed violence: $B = .002$, CI: -.007-.014; chronic witnessed violence: $B = .002$, CI: -.004-.01; multiple witnessed violence: $B = .003$, CI: -.003-.011; cumulative victimization: $B = .002$, CI: -.007-.014; chronic victimization: $B = .002$, CI: -.008-.015; multiple victimization: $B = .002$, CI: -.004-.011).

Research question 2c. Anxiety and hostility were examined as emotional reactivity mediators in the relationship between continuous violence exposure and PTSD outcomes measured by diagnosis and symptom count. In all analyses, baseline aggressive offending and race/ethnicity were used as covariates.

Anxiety as measured by the Brief Symptom Inventory (BSI) at 48 months did significantly mediate the relationship between cumulative witnessed violence and **PTSD diagnosis** (direct: $b = -.021$, $p = .425$; mediation: $B = .006$, CI: .0004-.0135) and between cumulative victimization and PTSD diagnosis (direct: $b = .041$, $p = .560$; mediation: $B = .015$, CI: .001-.037). All other direct effects and mediations with anxiety were non-significant for PTSD diagnosis (chronic witnessed violence: direct: $b = -.069$, $p = .596$, mediation $B = .012$, CI: -.004-.0368; multiple witnessed violence: direct: $b = -.183$, $p = .246$, mediation: $B = .019$, CI: -.003-.049; chronic victimization: direct: $b = -.011$, $p = .947$, mediation: $B = .037$, CI: -.002-.083; multiple victimization: $b = .062$, $p = .776$, mediation: $B = .043$, CI: -.002-.111). Hostility as measured by the BSI at 48 months did not significantly mediate the relationship between any of the continuous violence exposure variables and PTSD diagnosis (cumulative witnessed violence: direct: $b = .019$, $p = .455$, mediator: $B = .005$, CI: -.003-.011; chronic witnessed violence: direct: $b = -.068$, $p = .598$, mediator: $B = .013$, CI: -.012-.037; multiple witnessed violence: direct: $b = -.180$, $p = .256$, mediator: $B = .018$, CI: -.010-.047; cumulative victimization: direct: $b = -.036$, $p = .610$, mediator: $B = .012$, CI: -.009-.032; chronic victimization: direct: $b = .0006$, $p = .997$,

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mediator: B = .030, CI: -.031-.079; multiple victimization: direct: b = .097, p = .689, mediator B = .025, CI: -.024-.076).

When assessing possible mediation effects of anxiety and hostility in the relationship between continuous violence exposure and **PTSD symptoms**, anxiety was a significant mediator in the relationships between cumulative witnessed violence (direct: b = .037, p = .228, mediator: B = .012, CI: .001-.030) and PTSD symptoms, cumulative victimization (direct: b = .002, p = .980, mediator: B = .012, CI: .0006-.029) and PTSD symptoms, and chronic victimization (direct: b = .096, p = .637, mediator B = .012, CI: .0002-.027) and PTSD symptoms. Anxiety was not a significant mediator in the relationships between other violence exposure variables and PTSD symptoms (chronic witnessed violence: direct: b = -.209, p = .181, mediator: B = .005, CI: -.001-.016; multiple witnessed: direct: b = .302, p = .104, mediator: B = .007, CI: -.0006-.018; Multiple victimization: direct: b = .062, p = .776, mediator: B = .043, CI: -.002-.111). Results indicated that hostility was a consistent mediator in the relationship between continuous violence exposure and PTSD symptoms using all continuous violence exposure variables (cumulative witnessed violence: direct: b = .040, p = .203, mediator: B = .015, CI: .002-.031; chronic witnessed violence: direct: b = -.224, p = .154, mediator: B = .009, CI: .001-.020; multiple witnessed: direct: b = -.316, p = .089, mediator: B = .009, CI: .001-.021; cumulative victimization: direct: b = -.003, p = .975, mediator: B = .014, CI: .001-.029; chronic victimization: direct: b = .078, p = .702, mediator: B = .015, CI: .001-.032; multiple victimization: direct: b = .106, p = .741, mediator B = .008, CI: .0002-.019).

Results for Goal 3

Goal 3 sought to examine emotional processes, specifically emotion regulation and callousness/emotional reactivity, as mediators of the association of continuous violence exposure

during adolescence to PTSD symptoms and reoffending in early adulthood through four research questions. *Research question 3a* examined emotion regulation as a mediator in the association of continuous violence exposure in years 1-3 to PTSD diagnosis and symptoms at 72 months. *Research question 3b* examined emotion regulation as a mediator in the association of continuous violence exposure in years 1-3 to reoffending at 60 and 72 months. *Research question 3c* examined callousness/emotion reactivity as a mediator of the association of continuous violence exposure in years 1-3 to PTSD diagnosis and symptoms at 72 months. *Research question 3d* examined callousness/emotion reactivity as a mediator of the association of continuous violence exposure in years 1-3 to reoffending at 60 and 72 months.

Research question 3a. Hierarchical linear regression analyses in PROCESS (Hayes & Rockwood, 2017) were used to examine the hypothesis that emotion regulation would act as a mediator between continuous violence exposure and **PTSD diagnosis** at 72 months. In all analyses, baseline aggressive offending and race/ethnicity were used as covariates. Witnessed violence and violence victimization were tested as predictor variables separately. The cumulative frequency of witnessed violence in years 1-3 had no significant effect on PTSD diagnosis ($b = -.017$, $p = .475$), and emotion regulation did not mediate the relationship ($B = .000$, CI $= -.002-.002$). Chronic witnessed violence also showed no direct ($b = -.068$, $p = .553$) or indirect ($B = -.002$, CI $= -.017-.007$) effects on PTSD diagnosis. Multiple witnessed violence showed no direct ($b = -.207$, $p = .155$) or indirect ($B = .002$, CI $= -.010-.018$) associations with PTSD diagnosis. Cumulative frequency of violence victimization did not predict later PTSD diagnosis ($b = .002$, $p = .977$), and emotion regulation was not a mediator ($B = -.003$, CI $= -.015-.006$). Similarly, chronic violence victimization was not associated with PTSD diagnosis ($b = .087$, p $= .548$), and showed no mediation effects through emotion regulation ($B = -.006$, CI $= -.032-.011$). Multiple

violence did not show any direct (b = .178, p = .415) or indirect associations (B = -.007, CI = -.045-.015) with PTSD diagnosis either.

Emotion regulation was then examined as a mediator between continuous violence exposure (witnessed and victimization) in years 1-3 and **number of PTSD symptoms** endorsed at 72 months. Baseline aggressive offending and race/ethnicity were used as covariates.

Results showed no significant direct associations (cumulative witnessed violence: b = -.014, p = .571; chronic witnessed violence: b = -.099, p = .414; multiple witnessed violence: b = -.159, p = .280) between continuous violence exposure and PTSD symptoms or mediation effects with emotion regulation (cumulative witnessed violence: B = .0001, CI = -.002-.002; chronic witnessed violence: B = -.0008, CI = -.005-.002; multiple witnessed violence: B = -.0008, CI = -.002-.004). No significant direct or indirect associations were found between cumulative frequency of violence victimization (direct: b = .069, p =.316; indirect: B = -.002, CI = -.009-.001) chronic violence victimization (direct: b = .236, p =.141; indirect: B = -.002, CI = -.007-.002) or multiple violence victimizations (direct: b = .345, p = .186; indirect: B = -.001, CI = -.006-.001) and later PTSD symptoms.

Research question 3b. Emotion regulation was also examined as a mediator in the relationship between continuous violence exposure and later aggressive offending. In all analyses, baseline aggressive offending and race/ethnicity were used as covariates. Although all measures of continuous violence witnessing predicted increased aggressive offending at 60 months (year 5) (cumulative witnessed violence: b = .004, p < .001; chronic witnessed violence: b = .010, p < .001; multiple witnessed: b = .014, p < .001), emotion regulation was not a mediator in any of these relationships (cumulative witnessed violence: B = -.001, CI: -.003-.002; chronic witnessed violence: B = 0, CI: -.002-.002; multiple witnessed: B = -.0002, CI: -.003-

.002). Similarly, for violence victimization, all measures of continuous victimization were significant predictors of increased 60 months (year 5) offending (cumulative victimization: $b = .01$, $p < .001$; chronic victimization: $b = .022$, $p < .001$; multiple victimizations: $b = .028$, $p < .001$). Emotion regulation was not a mediator in any of these relationships (cumulative victimization: $B = -.0005$, CI: -.005-.004; chronic victimization: $B = -.0003$, CI: -.004-.003; multiple victimizations: $B = -.0001$, CI: -.003-.003).

Emotion regulation was also examined as a mediator in the relationship between continuous violence exposure and later aggressive offending at 72 months (year 6). Again, baseline aggressive offending and race/ethnicity were used as covariates. All three measures of continuous witnessed violence predicted increased aggressive offending at 72 months (year 6) (cumulative witnessed violence: $b = .003$, $p < .001$; chronic witnessed violence: $b = .013$, $p < .001$; multiple witnessed: $b = .012$, $p < .001$). Again, emotion regulation was not a mediator in any of these relationships (cumulative witnessed violence: $B = -.0006$, CI: -.004-.002; chronic witnessed violence: $B = .0004$, CI: -.002-.003; multiple witnessed violence: $B = -.0008$, CI: -.004-.001). All measures of continuous victimization were significant predictors of increased offending at 72 months (year 6) (cumulative victimization: $b = .01$, $p < .001$; chronic victimization: $b = .020$, $p < .001$; multiple victimizations: $b = .034$, $p < .001$). Emotion regulation was not a mediator in any of these relationships (cumulative victimization: $B = -.0009$, CI: -.002-.005; chronic victimization: $B = -.0009$, CI: -.002-.005; multiple victimizations: $B = .0008$, CI: -.002-.004).

Research question 3c. Hierarchical linear regression analyses in PROCESS (Hayes & Rockwood, 2017) were used to examine the hypothesis that callous-unemotional traits and emotional reactivity would act as mediators in the relationship between continuous violence

exposure and **PTSD diagnosis**. In all analyses, baseline aggressive offending and race/ethnicity were used as covariates. None of the measures of continuous witnessed violence at years 1-3 (cumulative witnessed violence: $b = -.014$, $p = .553$; chronic witnessed violence: $b = -.062$, $p = .594$; multiple witnessed: $b = -.193$, $p = .188$) or continuous violence victimization (cumulative victimization: $b = .005$, $p = .935$; chronic victimization: $b = .094$, $p = .517$; multiple victimizations: $b = .189$, $p = .390$) were significantly associated with PTSD diagnosis at 72 months (year 6). Callous-unemotional traits did not mediate associations between witnessed violence (cumulative witnessed violence: $B = -.003$, CI: -.012-.006; chronic witnessed violence: $B = -.009$, CI: -.050-.029; multiple witnessed: $B = -.011$, CI: -.048-.019) or victimization (cumulative victimization: $B = -.007$, CI: -.029-.011; chronic victimization: $B = -.014$, CI: -.065-.031; multiple victimizations: $B = .019$, CI: -.077-.028) and PTSD diagnosis.

Further mediation models tested the hypothesis that callous-unemotional traits would mediate the relationship between continuous violence exposure and **PTSD symptom count** at 72 months (year 6). Baseline aggressive offending and race/ethnicity were again used as covariates. None of the measures of continuous witnessed violence (cumulative witnessed violence: $b = -.015$, $p = .641$; chronic witnessed violence: $b = -.099$, $p = .420$; multiple witnessed: $b = -.145$, $p = .330$) or continuous violence victimization (cumulative victimization: $b = .017$, $p = .305$; chronic victimization: $b = .243$, $p = .135$; multiple victimizations: $b = .355$, $p = .176$) were significantly associated with PTSD symptom count at 72 months (year 6). Callous-unemotional traits did not mediate associations between witnessed violence (cumulative witnessed violence: $B = -.003$, CI: -.016-.009; chronic witnessed violence: $B = -.002$, CI: -.013-.009; multiple witnessed: $B = -.002$, CI: -.010-.005) or victimization (cumulative victimization: $B = -.003$, CI: -.014-.006; chronic

victimization: $B = -.003$, CI: -.014-.006; multiple victimizations: $B = .002$, CI: -.010-.004) and PTSD symptom count.

Research question 3d. Hierarchical linear regression analyses in PROCESS (Hayes & Rockwood, 2017) were used to examine the hypothesis that callous-unemotional traits at 48 months would act as a mediator between continuous violence exposure during years 1-3 and later aggressive offending at 60 and 72 months. In all analyses, baseline aggressive offending and race/ethnicity were used as covariates.

First, mediation models were tested using **aggressive offending at 60 months** as the outcome. Higher cumulative frequency of witnessed violence during years 1-3 significantly predicted increased aggressive offending ($b = .003$, $p < .001$), and callous-unemotional traits also partially mediated this association ($B = .027$, CI: .012-.045). Chronic witnessed violence also predicted increased aggressive offending ($b = .008$, $p < .01$), and callous-unemotional traits was again a significant mediator ($B = .027$, CI: .014-.045). Higher multiple witnessed violence predicted increased aggressive offending ($b = .012$, $p < .01$), with callous-unemotional traits mediating the relationship ($B = .016$, CI: .006-.028). Greater cumulative frequency of violence victimization in years 1-3 predicted increased aggressive offending at 60 months ($b = .009$, $p < .001$), and callous-unemotional traits was a mediator ($B = .022$, CI: .009-.038). Chronic violence victimization also predicted increased aggressive offending ($b = .019$, $p < .001$), with callous-unemotional traits as a mediator ($B = .021$, CI: .009-.037). Similarly, multiple violence victimizations were associated with increased aggressive offending ($b = .024$, $p < .001$), and callous-unemotional traits mediated the association ($B = .015$, CI = .004-.028).

Next, mediation models with callous-unemotional traits were tested using **72 months aggressive offending** as the outcome. In all mediation models, greater violence exposure was

associated with increased aggressive offending at 72 months (cumulative witnessed violence: $b = .003$, $p < .001$; chronic witnessed violence: $b = .012$, $p < .001$; multiple witnessed violence: $b = .010$, $p < .01$; cumulative victimization: $b = .009$, $p < .001$; chronic victimization: $b = .018$, $p < .001$; multiple victimization: $b = .031$, $p < .001$) and callous-unemotional traits acted as a mediator in the relationship (cumulative witnessed violence: $B = .023$, CI $= .010-.038$, chronic witnessed violence: $B = .022$, CI $= .010-.037$; multiple witnessed violence: $B = .013$, CI $= .004-.024$; cumulative victimization: $B = .019$, CI $= .008-.034$; chronic victimization: $B = .019$, CI $= .008-.034$; multiple victimization: $B = .014$, CI $= .004-.026$).

Results for Goal 4

Goal 4 sought to examine the moderating effects of participant gender, participant ethnicity and offender status (violent versus nonviolent offending). The effects for these variables were examined in individual analyses and presented throughout findings for goals 1 - 3.

Discussion

Goal 1

While research demonstrates the disproportionately high levels of violence exposure and rates of trauma symptoms in justice-involved adolescents (e.g., Abram et al., 2004), very little research in this area focuses on serious adolescent offenders who are serving sentences (Mulvey et al., 2004). Results suggest that the majority of participants are experiencing continuous violence exposure as witnesses to community violence, but the rates of continuous violence exposure are lower for victimization. Results also indicate that the rates of continuous, multiple witnessing are substantially higher than continuous, multiple victimization. With regards to ethnic group differences, White youth and Hispanic youth were exposed to significantly higher levels of community violence, via victimization, than African American youth, and African

American youth were exposed to significantly higher levels of community violence, via witnessing, than White and Hispanic youth. Although females showed slightly lower levels of violence exposure than males, these differences were negligible, suggesting that levels of continuous community violence experienced by males and females was comparable.

These findings suggest that both male and female serious adolescent offenders are at risk for exposure to community violence during adolescence, and this risk is particularly high for witnessing community violence. While these findings are consistent with cross-sectional findings demonstrating that the majority of justice-involved adolescence experience community violence exposure (e.g., Abram et al., 2004; Kerig et al., 2009), the current findings extend previous research by identifying the prevalence of violence across multiple time points. Existing research on adolescent offenders often limits assessment of violence exposure to one time point; however, juvenile offenders may be exposed to additional violence both during and after detainment, incarceration, or institutionalization (e.g., Dierkhising et al., 2014). Without an understanding of the prevalence of continuous violence exposure throughout adolescence, we are limited in our ability to understand the perpetuation of risk in the lives of adolescent offenders.

In addition to community violence exposure, participants reported exposure to violence in correctional and residential facilities. Results for prevalence of violence exposure and victimization show that three-fourths of participants in the current study reported witnessing violent encounters between other residents, and 17% reported being victimized by other residents. Further, almost two-thirds of participants witnessed violence between staff and residents and almost 10% reported being victimized by staff, with 5% reported being beaten by staff. A little over 20% of participants reported victimizing other residents and almost 7% reported perpetrated a violent act against staff members. Approximately half of the participants

in the current study reported being strip-searched at least once, almost one-fourth reported being physically restrained, and almost 40% reported being put in isolation. Similar to community violence, a significant number of participants have been exposed to violence in correctional and residential facilities, with the prevalence of witnessing violence being higher than the prevalence of victimization.

In addition to descriptive analyses, the current study also sought to use latent transition analysis to better understand the longitudinal patterns of community violence exposure that extend beyond initial justice system involvement and to delineate the associations between exposure and trauma symptoms over time. Informed by continuous traumatic stress (CTS) framework, which recognizes that for adolescent offenders, trauma exposure is both current and likely anticipated in the future, as opposed to existing only in the past (Eagle & Kaminer, 2013), the current study assessed anxiety and hostility symptoms as trauma symptoms. In addition to anxiety symptoms, youth living in environments of continuous exposure to trauma often exhibit symptoms of hostility and anger (Roach, 2013). The first aim was to derive and validate a typology of trauma exposure (community violence) and trauma symptoms (anxiety and hostility) for adolescent offenders and explore the temporal stability in trauma classes from middle to late adolescence. The second aim was to explore which demographic variables of participants at baseline (age, race/ethnicity, age at first offense, proportion of violent offenses, and exposure to community violence) were associated with membership in specific latent classes or the transition probabilities to and from classes over time.

Classes of violence exposure and trauma-related symptoms. The results of the current study reveal variability in adolescent offenders' exposure to community violence and trauma-related symptoms. The findings suggested that there were three classes of youth based on

violence and trauma: Witnessed with Hostility; Dually Exposed with Anxiety and Hostility; Not Exposed with Anxiety and Hostility. The smallest class of youth, the Witnessed with Hostility class, had a high probability of witnessing community violence and experiencing symptoms of hostility. However, it should be noted that participants in the Witnessed with Hostility class showed variations in their experience of witnessing community violence with moderate probabilities at year 1, which increased to high probabilities at year 2, and then decreased to moderately low probabilities at year 3. The largest class of participants, the Dually Exposed with Anxiety and Hostility class, had a high probability of both witnessing community violence and experiencing anxiety and hostility, as well as a moderate probability of being a victim of violence. The participants classified in the Not Exposed with Anxiety and Hostility had a high probability of experiencing symptoms of anxiety and hostility, but had a low probability of witnessing or being a victim of community violence. Consistent with predictions, there was a high exposure class (Dually Exposed with Anxiety and Hostility class) and a low exposure class (Not Exposed with Anxiety and Hostility); however, results also revealed a witnessing class.

Interestingly, the three classes of participants found in the current study are qualitatively and substantially different from classes obtained in similar research with community-based samples. Specifically, person-centered research with community-based samples of adolescents demonstrates that the majority of youth are classified in low violence exposure groups (Copeland-Linder et al., 2010; Gaylord-Harden et al., 2016; Gaylord-Harden et al., 2015; Burnside et al., 2018). In contrast, almost 70% of adolescent offenders in the current study were classified in the Dually Exposed with Anxiety and Hostility class, experiencing high levels of both witnessing and victimization at year 1. Although this percentage dropped to a little more than 50% at Years 2 and 3, this finding is critical, as it underscores the disparities in trauma

exposure among youth who have served sentences for felony offenses. In addition, findings also suggest that symptoms of anxiety and hostility are very high for the current sample, and the presence of the Not Exposed with Anxiety and Hostility class suggests that these symptoms may be independent of violence exposure for some youth.

Temporal instability in violence and trauma classes. Overall, the LTA results demonstrated high instability in violence exposure and trauma-related symptoms over time for adolescent offenders, with a large proportion of participants moving from one violence and trauma class to another at each transition. From year 1 to year 2, the participants in the Dually Exposed with Anxiety and Hostility class showed the highest stability of remaining in the same latent status. However, the participants in the Witnessing with Hostility class showed an equally high probability of transitioning to the Not Exposed with Anxiety and Hostility, indicating that these youth transitioned from a class with high levels of witnessing community violence to a class with very low violence exposure. Further, the Not Exposed with Anxiety and Hostility class showed a high probability of transitioning to the Witnessing with Hostility, indicating that these youth were exposed to very low levels of violence exposure at year 1, but shifted to a class with high levels of witnessing at year 2. From year 2 to year 3, the participants in the Not Exposed with Anxiety and Hostility showed the highest probability of remaining in the same latent status. Again, the Witnessing with Hostility class was marked by high instability from year 2 to year 3, but this time, they showed a high probability of transitioning to the Dually Exposed with Anxiety and Hostility class. In contrast to the high stability from year 1 to year 2, the Dually Exposed with Anxiety and Hostility class showed the highest instability from year 2 to year 3, with a very high probability of transitioning to the Witnessing with Hostility class.

These patterns suggest that those with high levels of witnessing and victimization, or dual exposure, at year 1 continued to show high violence exposure throughout the three time points, although the probability of victimization dropped in comparison to witnessing at the final transition. Those with high levels of witnessing violence at year 1 shifted to very low exposure to violence for the remainder of the time points assessed. Those with very low violence exposure at the beginning seemed to be most vulnerable, showing increasingly high levels of violence exposure throughout the time points assessed. Specifically, those with low violence exposure transitioned to high levels of witnessing, and then transitioned to high levels of both witnessing and victimization, or dual exposure.

Goal 2

Given that community violence exposure can predict future offending (Baskin & Sommers, 2013), it was important to extend Goal 1 by examining continuous violence exposure during adolescence as a predictor of subsequent offending. Results highlight the role of chronic violence exposure in the prediction of both self-reported and official record re-offending in juvenile justice involved youth, above and beyond the role of demographic and other risk factors. Specifically, both continuous violence exposure during adolescence and multiple continuous violence exposure during adolescence predicted higher levels of self-reported reoffending at all three time points assessed in early adulthood. Further, these associations were demonstrated after controlling for participant gender, ethnicity, age, baseline age at first offense, and baseline offending. Interestingly, separate analyses for males and females demonstrated that these findings were more consistent for male offenders than for female offenders, suggesting that the risk of re-offending is higher for male offenders who are exposed to continuous community violence during and after detainment. It is unclear why female offenders showed more

inconsistent associations between violence exposure and offending, and future research may focus on identifying factors that may protect female offenders who are exposed to community violence during and after detainment.

In addition to self-report of offending, the current study also utilized survival analyses to model time until re-arrest using official records of re-arrest on a subsample of 581 male offenders who had yet to be re-arrested at the 12-month data collection. Within this sample, 68.1% of youth were re-arrested between the year 1 and year 6, and survival analysis was used to assess the risk for the re-arrest during that time period based on continuous violence exposure at year 1 (Singer & Willett, 2003). Results indicated that higher levels of community victimization at year 1 significantly increased the risk for re-arrest. The covariates age and lifetime violent offending at baseline also significantly increased the risk for re-arrest. However, when lifetime community violence exposure, assessed at baseline, was added as an additional covariate, lifetime violent offenses was no longer a significant predictor. These findings highlight the critical role of community violence exposure during and after detainment, as well as prior to detainment, for adolescent offenders.

Why does community violence exposure place offenders at risk for both self-report of offending and re-arrest? Community violence exposure is associated with numerous psychosocial outcomes during adolescence, but it is most consistently and strongly associated with aggressive and delinquent behaviors during this developmental period (Fowler et al., 2009; McDonald & Richmond, 2008), even after controlling for prior levels of aggressive and delinquent behavior (Lynch, 2003). This finding has been supported in both community-based samples of youth (Bingenheimer, Brennan, & Earls, 2005; Patchin et al, 2006) and justice-involved youth (Abrams & Freisthler, 2010; Eitle & Turner, 2002). Research on victim-offender

overlap (e.g., Jennings, Piquero & Reingle, 2012; Posick, 2013) and numerous theories attempt to explain how community violence exposure heightens the risk delinquent behaviors (Fowler et al., 2009), including social cognitive theories that suggest that exposure to community violence models violence as an acceptable behavior (McMahon et al., 2009); traditional and contemporary learning theories that suggest that delinquent peer affiliation heightens the risk of both exposure to violence and delinquent behavior (e.g., Brook, Brook, Rubenstone, Zhang, & Saar, 2011); physiologically based theories indicate that suggest that violence-exposed youth experience reduced physiological arousal which increases their risk of violent behavior (e.g., Mrug et al., 2016); and hypersensitization models that suggest that violence-exposed youth experience hyperarousal and hypervigilance which increases the risk of reactive violent behavior (e.g., Gaylord-Harden, Bai & Simic, 2017). For adolescent offenders, involvement with the justice system likely exacerbates these proposed pathways from community violence exposure to delinquent behavior (e.g., strengthening associations to delinquent peers in correctional facilities, exposure to additional traumatic experiences in correctional facilities that increase hyperarousal), and heightens risk of reoffending.

Regarding mental health symptoms, trauma symptoms, as operationalized by hostility and anxiety symptoms, were not predictive of re-offending. In addition, contrary to expectations, continuous violence exposure was not predictive of an increased likelihood of a future posttraumatic stress disorder for male offenders, but witnessing multiple violent events did predict risk for PTSD diagnosis in early adulthood for female offenders. These results highlight the importance of the role of trauma-informed screening and intervention programs for juvenile justice involved in order to reduce recidivism rates. It is not clear why the role of mental health symptoms in the prediction of re-offending or as an outcome of continuous violence exposure

was limited in the current study. There is some evidence with community-based samples of African American and Latino male adolescents that the anxiety symptom, hyperarousal, mediates the association between community violence exposure in early adolescence and delinquent behavior in late adolescence (Gaylord-Harden, So, Bai & Tolan, 2017). Perhaps these associations differ for justice-involved youth through a desensitization process (e.g., Mrug et al., 2016); but additional research is warranted to further understand the role of mental health symptoms in the prediction of re-offending or as an outcome of violence exposure in adolescent offenders.

Goal 3

Results suggest emotional factors can mediate the relationships between continuous violence exposure in adolescence and later mental health and behavioral outcomes in early adulthood. Specifically, callous-unemotional traits and hostility mediated the relationship between early continuous violence exposure and later aggressive offending. Anxiety symptoms can also mediate the relationship between early exposure to cumulative or chronic violence and later PTSD symptoms and diagnosis. These results may help provide suggestions for intervention efforts with juvenile justice youth at risk for further offending or the development of posttraumatic stress symptoms. Interestingly, emotion regulation did not mediated the association of continuous violence exposure during adolescence to PTSD diagnosis or number of PTSD symptom. Further, callous-unemotional traits did not mediate the association between continuous violence exposure during adolescence and PTSD diagnosis or symptoms. The lack of mediation effects for emotion regulation and callous-unemotional traits may reflect the lack of an association between continuous violence exposure and PTSD. However, emotion regulation also failed to mediate the association between continuous violence exposure and self-reported

offending in early adulthood, questioning the role of emotion regulation behaviors for adolescent offenders. Based on prior research demonstrating that youth exposed to traumatic stressors may show emotion dysregulation, it was proposed that the ability the regulate emotions would be a key mechanism in the association between continuous violence exposure and outcomes. However, the pattern of findings suggests that a callous-unemotional traits, reflected by a lack of emotion or learned emotional detachment (Bennet & Kerig, 2014), is more salient for adolescent offenders. For juvenile offenders in the current study, callousness places them at heightened risk for reoffending.

Limitations

The results of the current study should be considered in light of potential limitations. First, findings from this study were based on a unique, high-risk sample of males involved in the criminal justice system and may not be generalizable to other populations of youth. Secondly, all measures in the current study were self-report measures. Although research has demonstrated that youth's self-report of violence exposure (e.g., Cooley-Strickland et al., 2009) and mental health symptoms (e.g., Abela & Hankin, 2011) have demonstrated adequate reliability, there is still a possibility of shared method variance. In addition, given that some research has demonstrated that differential outcomes can depend on the severity, type and frequency of exposure, the use of a binary scale to measure violence exposure may limit the understanding of the violence exposure experienced by the youth (Sargent, Zahniser, Gaylord-Harden, Morency, & Jenkins, 2018; Mitchell, Hamby, Turner, Shattuck, & Jones, 2015; Goldner, Gross, Richards, & Ragsdale, 2014). Finally, although the current study limited data analysis to three time points to capture behavior and symptoms during middle to late adolescence, the time period assessed in the current study may not cover some participants' entire period of potential criminal activity and

data covering a longer period of time may yield different classes of violence exposure (Mulvey et al., 2010).

In light of the limitations, the current study has several notable strengths. In addition to utilizing a large, purposive sample, the current study expands upon the current literature by utilizing person-based analyses, as opposed to variable-based analyses. While some prior studies have examined classes of violence exposure in order to better understand within-group difference (e.g., Gaylord-Harden, Zakarayan, Bernard, & Pekoc, 2015; Gaylord-Harden, Dickson, & Pierre, 2016; Burnside, Gaylord-Harden, So, & Voisin, 2018), these studies have utilized community-based samples. The current study expands on this literature by examining how these classes change over time in justice-involved youth, thus considering additional trauma exposure that continues during and after involvement with the justice system. Further, the current study utilized both self-report of offending and official records of re-arrest.

Implications for Policy, Practice, and Future Research

Our work shows that adolescent offenders are exposed to disproportionately high levels of community violence, as well as violence exposure in correctional and residential settings. As such, the justice system is in need of policies that support trauma-informed care and services for adolescent offenders to mitigate the impact of violence exposure on functioning. Recent reviews of trauma-informed care in the juvenile justice system identifies specific practices related to screening and assessment, and services and intervention (Branson, Baetz, Horwitz & Hoagwood, 2017; Dierkhising & Branson, 2016). For example, the implementation of universal screening for trauma exposure and trauma-related impairment should be utilized when youth enter the juvenile justice system. Screening for trauma exposure should include an in-depth assessment of community violence exposure as both a witness to violence and a victim of violence. Further,

given that adolescent offenders may experience continuous violence exposure which predicts unique patterns of trauma symptoms, measures of trauma-related impairment should be validated with justice-involved youth to ensure that the measures are contextually-relevant. In regards to services, our findings suggest that evidence-based trauma-responsive treatment should be available and accessible to justice-involved youth (Branson et al., 2017). Further, given our findings that adolescent offenders are exposed to high levels of violence during detainment/incarceration and continue to be exposed to high levels of community violence after release, trauma-responsive treatment should be made available in both community-based settings and juvenile detention/correctional facilities (Branson et al., 2017). In addition, evaluation research is needed to determine the long-term effects of such treatment and interventions on trauma exposure, trauma-related impairment, re-offending, and re-arrest (Dierkhising & Branson, 2016).

Policies that shift the juvenile justice focus from punitive practices to treatment and rehabilitation will be needed to adequately support justice-involved youth with histories of violence exposure. Due to the traumatic nature of violence, community violence exposure is a health issue and should be treated as such. We have demonstrated the debilitating effects of continuous violence exposure on behavior and symptomatology. Thus, rather than responding to offenders' trauma-related behavior in punitive ways, which may further traumatize them, policies should work to ensure that the juvenile justice system and related institutions/organizations in the lives of young people are trauma-informed and trauma-responsive. In particular, our findings on the levels of violence exposure in correctional settings and residential settings underscores the need for extensive training is needed for staff to understand the prevalence and impact of trauma, how to implement trauma-informed practices,

assisting youth in developing trauma-informed safety plans and recognizing signs and triggers of trauma reactions (Branson et al., 2017; Dierkhising & Branson, 2016). Research demonstrating the efficacy of the combination between trauma-responsive treatment and trauma training for staff in correctional facilities on youth outcomes supports the assertions system-level changes are needed (Dierkhising & Branson, 2016).

Given our finding that the majority of adolescent offenders are exposed to continuous violence after release, policies that support juvenile re-entry into schools and communities are needed. A recent meta-analytic review of re-entry programs for juvenile offenders found that the overall effect of re-entry programs on reducing recidivism rates was non-significant, but the subgroup analysis found significant positive treatment effects for older adolescents and youth who engaged in violent offenses (Weaver & Campbell, 2015). While the findings for older adolescents and violent offenders is promising, the general findings of the review suggest that there is an urgent need to improve re-entry services for justice-involved youth. As has been noted regarding adolescent offenders, "The pivotal policy question concerns the extent to which the manifold risks that juvenile offenders enter the system with can be reduced or altered in order to divert deleterious outcomes" (Baglivio et al., 2018, p. 445). The goal of re-entry programs should be to reduce or alter risks that led to offending to reduce the likelihood of re-offending, such as community violence exposure. Strong collaborations are needed between service providers, including schools, community mental health agencies, the health care system, child welfare system, and residential facilities.

Finally, the most effective policies would be those designed to reduce violent crime, thereby minimizing opportunities for youth to be exposed to violence in the first place. Policies that focus on economic investment in under-resourced communities to improve school

conditions, create high quality mixed income housing, and provide job opportunities and

workforce development will likely help to reduce violence.

References

Abrams, L. S., & Freisthler, B. (2010). A spatial analysis of risks and resources for reentry youth

in Los Angeles County. *Journal of the Society for Social Work and Research*, *1*(1), 41-

55.

Allwood, M. A., & Bell, D. J. (2008). A preliminary examination of emotional and cognitive

mediators in the relations between violence exposure and violent behaviors in youth.

Journal of Community Psychology, *36*(8), 989-1007.

American Psychiatric Association. (2013). *DSM 5*. American Psychiatric Association.

Baglivio, M. T., Epps, N., Swartz, K., Huq, M. S., Sheer, A., & Hardt, N. S. (2014). The

prevalence of adverse childhood experiences (ACE) in the lives of juvenile offenders.

Journal of Juvenile Justice, *3*(2), 1.

Bechtold, J., Cavanagh, C., Shulman, E. P., & Cauffman, E. (2014). Does mother know best?

Adolescent and mother reports of impulsivity and subsequent delinquency. *Journal of*

Youth and Adolescence, *43*(11), 1903-1913.

Becker, S. P., Kerig, P. K., Lim, J. Y., & Ezechukwu, R. N. (2012). Predictors of recidivism

among delinquent youth: Interrelations among ethnicity, gender, age, mental health

problems, and posttraumatic stress. *Journal of Child & Adolescent Trauma*, *5*(2),

145-160.

Benjamin, A., & Carolissen, R. (2015). "They just block it out": Community counselors'

narratives of trauma in a low-income community. *Peace and Conflict: Journal of Peace*

Psychology, *21*(3), 414.

Bennett, D. C., & Kerig, P. K. (2014). Investigating the Construct of Trauma‑Related Acquired

Callousness Among Delinquent Youth: Differences in Emotion Processing. *Journal of*

Traumatic Stress, *27*(4), 415-422.

Birckhead, T. R. (2015). Children in Isolation: The Solitary Confinement of Youth. *Wake Forest L. Rev.*, *50*, 1.

Brame, Robert, Shawn D. Bushway, & Raymond Paternoster (2003). Examining the prevalence of criminal desistance. *Criminology, 41*, 423–448

Brame, R., Fagan, J., Piquero, A. R., Schubert, C. A., & Steinberg, L. (2004). Criminal careers of serious delinquents in two cities. *Youth Violence and Juvenile Justice*, *2*(3), 256-272.

Branson, C. E., Baetz, C. L., Horwitz, S. M., & Hoagwood, K. E. (2017). Trauma-informed juvenile justice systems: A systematic review of definitions and core components. *Psychological Trauma: Theory, Research, Practice, and Policy*, *9*(6), 635.

Brook, D. W., Brook, J. S., Rubenstone, E., Zhang, C., & Saar, N. S. (2011). Developmental associations between externalizing behaviors, peer delinquency, drug use, perceived neighborhood crime, and violent behavior in urban communities. *Aggressive Behavior, 37*(4), 349-361.

Byrne, J. M., & Stowell, J. (2007). Examining the link between institutional and community violence: Toward a new cultural paradigm. *Aggression and violent behavior*, *12*(5), 552-563.

Cheong, J., MacKinnon, D., & Khoo, S. (2003). Investigation of mediational processes using parallel process latent growth curve modeling. *Structural Equation Modeling, 10*, 238–262.

Derogatis, L. R., & Melisaratos, N. (1983). The brief symptom inventory: an introductory report. *Psychological Medicine, 13*(03), 595-605.

Dierkhising, C. B., & Branson, C. E. (2016). Looking Forward: A Research and Policy Agenda

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for Creating Trauma-Informed Juvenile Justice Systems. *Journal of Juvenile Justice, 5*(1).

Dierkhising, C. B., Ko, S. J., Woods-Jaeger, B., Briggs, E. C., Lee, R., & Pynoos, R. S. (2013). Trauma histories among justice-involved youth: Findings from the National Child Traumatic Stress Network. *European Journal of Psychotraumatology*, *4*.

Dierkhising, C. B., Lane, A., & Natsuaki, M. N. (2014). Victims behind bars: A preliminary study of abuse during juvenile incarceration and post-release social and emotional functioning. *Psychology, Public Policy, and Law*, *20*(2), 181.

Duncan, T. E. & Duncan, S. C. (2004). An introduction to latent growth curve modeling. *Behavior Therapy, 35,* 333-363.

Duncan, T. E., Duncan, S. C., & Stryker, L. (2006). *An Introduction to Latent Variable Growth Curve Modeling* (2nd ed.). Mahwah NJ: Lawrence Erlbaum.

Eagle, G., & Kaminer, D. (2013). Continuous traumatic stress: Expanding the lexicon of traumatic stress. *Peace and Conflict: Journal of Peace Psychology*, *19*(2), 85.

Eitle, D., & Turner, R. J. (2002). Exposure to community violence and young adult crime: The effects of witnessing violence, traumatic victimization, and other stressful life events. *Journal of Research in Crime and Delinquency*, *39*(2), 214-237.

Fontaine, N. M., Lacourse, E., Vitaro, F., & Tremblay, R. E. (2014). Links between trajectories of self-reported violent and nonviolent offending and official offending during adolescence and adulthood. *Criminal Behaviour and Mental Health*, *24*(4), 277-290.

Ford, J. D. (2002). Traumatic victimization in childhood and persistent problems with oppositional-defiance. *Journal of Aggression, Maltreatment and Trauma, 11*, 25-58

Ford, J. D., Chapman, J., Mack, J. M., & Pearson, G. (2006). Pathways from traumatic child

This resource was prepared by the author(s) using Federal funds provided by the U.S. Department of Justice. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

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victimization to delinquency: Implications for juvenile and permanency court proceedings and decisions. *Juvenile and Family Court Journal*, *57*(1), 13-26.

Ford, J. D., Kerig, P. K., Desai, N., & Feierman, J. (2016). Psychosocial Interventions for Traumatized Youth in the Juvenile Justice System: Research, Evidence Base, and Clinical/Legal Challenges. *Journal of Juvenile Justice*, *5*(1), 31.

Fowler, P. J., Tompsett, C. J., Braciszewski, J. M., Jacques-Tiura, A. J., & Baltes, B. B. (2009). Community violence: A meta-analysis on the effect of exposure and mental health outcomes of children and adolescents. *Development and Psychopathology*, *21*(01), 227-259.

Fox, B. H., Perez, N., Cass, E., Baglivio, M. T., & Epps, N. (2015). Trauma changes everything: Examining the relationship between adverse childhood experiences and serious, violent and chronic juvenile offenders. *Child Abuse & Neglect*, *46*, 163-173.

Garrido, V., & Morales, L. A. (2007). Serious (violent or chronic) juvenile offenders: A systematic review of treatment effectiveness in secure corrections.

Gaylord-Harden, N. K., Cunningham, J. A. & Zelencik, B. (2011). Effects of exposure to community violence on internalizing symptoms: Does desensitization to violence occur in African American youth? *Journal of Abnormal Child Psychology, 39*, 711-719

Gaylord-Harden, N. K., Dickson, D. & Pierre, C. L. (2016). Profiles of community violence exposure among African American youth: An examination of desensitization using latent class analysis. *Journal of Interpersonal Violence, 31*(11), 2077-2101.

Gaylord-Harden, N. K., So, S., Bai, G. J., Henry, D. & Tolan, P. H. (in press). Examining the pathologic adaptation model of community violence exposure in male adolescents of color. *Journal of Clinical Child and Adolescent Psychology*.

Gaylord-Harden, N. K., Zakaryan, A., Bernard, D. L. & Pekoc, S. (2015). Community-level victimization and aggressive behavior in African American male adolescents: A profile analysis. *Journal of Community Psychology, 43*(4), 502-519.

Griffin, P. (2006). Getting out of trouble: The pathways to desistance study. *Pennsylvania Progress*, *11*(4), 1-9.

Hamber, B., & Lewis, S. (1997). An overview of the consequences of violence and trauma in South Africa. Cape Town, South Africa: Centre for the Study of Violence and Reconciliation. Retrieved June 19, 2016 from http://www.csvr.org.za/index.php/publications/1778-an-overview-of-the-consequences-of -violence-and-trauma-in-south-africa.html.

Haney, C. (2003). The psychological impact of incarceration: Implications for post-prison adjustment. *Prisoners once removed: The impact of incarceration and reentry on children, families, and communities*, *33*, 66.

Hu, L. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.

Huizinga, D., Esbensen, F., & Weihar, A. (1991). Are there multiple paths to delinquency? *Journal of Criminal Law and Criminology, 82*, 83-118.

Jensen, P. S., Rubio-Stipec, M., Canino, G., Bird, H. R., Dulcan, M. K., Schwab-Stone, M. E., & Lahey, B. B. (1999). Parent and child contributions to diagnosis of mental disorder: are both informants always necessary? *Journal of the American Academy of Child & Adolescent Psychiatry*, *38*(12), 1569-1579.

Jennings, W. G., Piquero, A. R., & Reingle, J. M. (2012). On the overlap between victimization and offending: A review of the literature. *Aggression and Violent Behavior*, *17*(1), 16-26.

This resource was prepared by the author(s) using Federal funds provided by the U.S. Department of Justice. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

65

Jonson-Reid, M. (1998). Youth violence and exposure to violence in childhood: An ecological review. *Aggression and Violent Behavior, 3*(2), 159-179.

Kerig, P. K., & Becker, S. P. (2012). Trauma and girls' delinquency. In *Delinquent Girls* (pp. 119-143). Springer New York.

Kerig, P. K., Moeddel, M. A., & Becker, S. P. (2011). Assessing the sensitivity and specificity of the MAYSI-2 for detecting trauma among youth in juvenile detention. In *Child & Youth Care Forum* (Vol. 40, No. 5, pp. 345-362). Springer: US.

Kerig, P. K., Ward, R. M., Vanderzee, K. L., & Moeddel, M. A. (2009). Posttraumatic stress as a mediator of the relationship between trauma and mental health problems among juvenile delinquents. *Journal of Youth and Adolescence*, *38*(9), 1214-1225.

Ko, S. J., Ford, J. D., Kassam-Adams, N., Berkowitz, S. J., Wilson, C., Wong, M., ... & Layne, C. M. (2008). Creating trauma-informed systems: child welfare, education, first responders, health care, juvenile justice. *Professional Psychology: Research and Practice, 39*(4), 396.

Krabbendam, A. A. (2016). Troubled girls, troubled futures: The adverse adult outcomes of detained adolescent females. Unpublished manuscript.

Lai, V., Zeng, G., & Chu, C. M. (2016). Violent and Nonviolent Youth Offenders Preliminary Evidence on Group Subtypes. *Youth Violence and Juvenile Justice*, *14*(3), 313-329.

Lambie, I., & Randell, I. (2013). The impact of incarceration on juvenile offenders. *Clinical Psychology Review*, *33*(3), 448-459.

Lussier, P., McCuish, E., & Corrado, R. R. (2015). The Adolescence–Adulthood Transition and Desistance from Crime: Examining the Underlying Structure of Desistance. *Journal of Developmental and Life-Course Criminology*, *1*(2), 87-117.

McMahon, S. D., Felix, E. D., Halpert, J. A., & Petropoulos, L. A. (2009). Community violence exposure and aggression among urban adolescents: Testing a cognitive mediator model. *Journal of Community Psychology*, *37*(7), 895-910.

McMasters, A. (2015). *Effective strategies for preventing recidivism among juveniles*. Unpublished manuscript.

Mulvey, E. P. (2011). Highlights from pathways to desistance: A longitudinal study of serious adolescent offenders. Washington, DC: Office of Justice Programs, U.S. Department of Justice.

Mulvey, E. P., Schubert, C. A., & Piquero, A. (2014). Pathways to Desistance-Final Technical Report.

Mulvey, E. P., Steinberg, L., Piquero, A. R., Besana, M., Fagan, J., Schubert, C., & Cauffman, E. (2010). Trajectories of desistance and continuity in antisocial behavior following court adjudication among serious adolescent offenders. *Development and Psychopathology, 22*(02), 453-475.

Muthén, L. K., & Muthén, B. O. (2010). *MPLUS user's guide* (7th ed.) Los Angeles, CA: Muthen & Muthen.

Muthén, L.K. & Muthén, B. (2002). How to use a Monte Carlo study to decide on sample size and determine power. *Structural Equation Modeling, 4*, 599-620.

Osher, D., Quinn, M. M., Poirer, J. R., & Rutherford, R. (2003). Deconstructing the pipeline: Using efficacy and effectiveness data and cost-benefit analyses to reduce minority youth incarceration. *New Directions in Youth Development*, *99*, 91-120.

Patchin, J. W., Huebner, B. M., McCluskey, J. D., Varano, S. P., & Bynum, T. S. (2006). Exposure to community violence and childhood delinquency. *Crime & Delinquency*,

52(2), 307-332.

Piquero, A. R., & Steinberg, L. (2010). Public preferences for rehabilitation versus incarceration of juvenile offenders. *Journal of Criminal Justice*, *38*(1), 1-6.

Posick, C. (2013). The overlap between offending and victimization among adolescents: Results from the second international self-report delinquency study. *Journal of Contemporary Criminal Justice*, *29*(1), 106-124.

Quinn, M. M., Poirier, J. M., & Garfinkel, L. (2005). Girls with mental health needs in the juvenile justice system: Challenges and inequities confronting a vulnerable population. *Exceptionality*, *13*(2), 125-139.

Roach, C. B. (2013). Shallow affect, no remorse: The shadow of trauma in the inner city. *Peace and Conflict: Journal of Peace Psychology*, *19*(2), 150.

Schubert, C. A., Mulvey, E. P., & Glasheen, C. (2011). Influence of mental health and substance use problems and criminogenic risk on outcomes in serious juvenile offenders. *Journal of the American Academy of Child & Adolescent Psychiatry*, *50*(9), 925-937.

Seigle, E., Walsh, N. & Weber, J. (2014). *Core Principles for Reducing Recidivism and Improving Other Outcomes for Youth in the Juvenile Justice System.* New York: Council of State Governments Justice Center.

Simkins, S., Beyer, M., & Geis, L. M. (2012). The Harmful Use of Isolation in Juvenile Facilities: The Need for Post Disposition Representation. *Washington University Journal of Law and Policy*, *38*(24).

Sneed, T. (2014). What youth incarceration costs taxpayers. U.S. News & World Report. http://www.usnews.com/news/blogs/data-mine/2014/12/09/what-youth-incarceration-costs-taxpayers.

This resource was prepared by the author(s) using Federal funds provided by the U.S. Department of Justice. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

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Snyder, H. N., & Sickmund, M. (2006). Juvenile offenders and victims: 2006 national report. *Office of juvenile justice and delinquency prevention*.

Straker, G. (1987). The continuous traumatic stress syndrome: The single therapeutic interview. *Psychology in Society, 8*, 48–79.

Straker, G., & Moosa, F. (1994). Interacting with trauma survivors in contexts of continuing trauma. *Journal of Traumatic Stress, 7*, 457–465.

Taylor, T. J., Peterson, D., Esbensen, F. A., & Freng, A. (2007). Gang membership as a risk factor for adolescent violent victimization. *Journal of Research in Crime and Delinquency, 44*, 351-380.

Teplin, L. A., Welty, L. J., Abram, K. M., Dulcan, M. K., & Washburn, J. J. (2012). Prevalence and persistence of psychiatric disorders in youth after detention: a prospective longitudinal study. *Archives of General Psychiatry*, *69*(10), 1031-1043.

Trupin, E. W., Stewart, D. G., Beach, B., & Boesky, L. (2002). Effectiveness of a dialectical behaviour therapy program for incarcerated female juvenile offenders. *Child and Adolescent Mental Health*, *7*(3), 121-127.

Tsui, J. C. (2014). Breaking Free do the Prison Paradigm: Integrating Restorative Justice Techniques into Chicago's Juvenile Justice System. *Journal of Criminal Law & Criminology*, *104*, 635.

van der Kolk, B. A., McFarlane, A. C., & Weisaeth, L. (Eds.). (1996). Traumatic stress: The effects of overwhelming experience on mind, body, and society. New York, NY: Guilford Press.

Weaver, R. D., & Campbell, D. (2015). Fresh start: a meta-analysis of aftercare programs for juvenile offenders. *Research on Social Work Practice*, *25*(2), 201-212.

Weierstall, R., Hinsberger, M., Kaminer, D., Holtzhausen, L., Madikane, S., & Elbert, T. (2013). Appetitive aggression and adaptation to a violent environment among youth offenders. *Peace and Conflict: Journal of Peace Psychology*, *19*(2), 138.

Wilson, H. W., Stover, C. S., & Berkowitz, S. J. (2009). Research Review: The relationship between childhood violence exposure and juvenile antisocial behavior: a meta‐analytic review. *Journal of Child Psychology and Psychiatry, 50*(7), 769-779.

World Health Organization. (1990). *Composite International Diagnostic Interview*. Geneva, Switzerland: World Health Organization.

Table 1

Number of interviews and completion percentage (of the 1,354) at each time point

	6-month	12-month	18-month	24-month	30-month	36-month	48-month
Adolescent Report	1,262 (93%)	1,261 (93%)	1,230 (91%)	1,230 (91%)	1,232 (91%)	1,238 (91%)	1,211 (89%)

	60-month	72-month	84-month
Adolescent Report	1,207 (89%)	1,178 (87%)	1,134 (84%)

Table 2

Fit Statistics for Latent Class Analysis for Times 1, 2, and 3

Time point	Number of classes	BIC	Entropy	LMR p value	BLRT p value
Year 1	2	3672.926	0.467	*p* < .001	*p* < .001
	3	3685.05	0.65	*p* = .0023	*p* < .001
	4	3712.793	0.806	*p* = .0237	p = .0741
	5	3747.559	0.744	*p* = 0.8645	*p* = 1.000
	6	3782.333	0.548	*p* = 0.0440	*p* = 1.000
Year 2	2	3461	0.521	*p* < .001	*p* < .001
	3	3467.932	0.657	*p* < .001	*p* < .001
	4	3498.219	0.621	*p* = 0.0781	*p* = 0.333
	5	3532.785	0.454	*p* = 0.9500	*p* = 1.000
	6	3567.354	0.748	*p* = 0.5092	*p* = 1.000
Year 3	2	3463.047	0.506	*p* < .001	*p* < .001
	3	3459.839	0.726	*p* < .001	*p* < .001
	4	3484.481	0.544	*p* = 0.0161	*p* = 0.020
	5	3514.8	0.535	*p* = 0.0401	*p* = 0.040
	6	3549.447	0.594	*p* = 0.4972	*p* = 1.000

Note. LMR = Lo-Mendell-Rubin test; BLRT = bootstrap likelihood ratio test.

Table 3

*Conditional Item Probabilities and Percentage of Participants in Each Class for the Three-Class
LCA Solutions at Years 1, 2, and 3*

Items	Not exposed w/ anxiety and hostility	Witnessing w/ hostility	Dually exposed w/ anxiety and hostility
Year 1			
$N = 1,048$	26%	6%	68%
Witnessing	0.15	0.46	1.00
Victimization	0.08	0.04	0.43
Anxiety	1.00	0.17	0.86
Hostility	0.89	0.67	0.97
Year 2			
$N = 1,006$	39%	8%	53%
Witnessing	0.15	1.00	0.88
Victimization	0.00	0.32	0.38
Anxiety	0.64	0.00	0.94
Hostility	0.74	0.54	0.95
Year 3			
$N = 1,022$	52%	9%	39%
Witnessing	1.00	0.23	0.05
Victimization	0.31	0.00	0.09
Anxiety	0.85	0.00	1.00
Hostility	0.94	0.52	0.82

Note. LCA = latent-class analysis

Table 4

Predictors of Time to Re-arrest

	Estimate	SE	*p*
Age	-0.127	0.049	.010
Race/Ethnicity	0.033	0.065	.612
Age of first offense	0.059	0.035	.091
Self-reported aggressive offending	0.202	0.325	.534
Lifetime violence exposure	0.046	0.025	.064
Anxiety	0.015	0.293	.958
Hostility	-0.280	0.320	.382
Community violence-witnessing	0.010	0.042	.813
Community violence- victimization	0.393	0.085	<.001

Figure 1

LCA: Class Membership based on Conditional Item Probabilities (Year 1)