EARLY ADULT INVOLVEMENT IN THE CRIMINAL JUSTICE SYSTEM

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ABSTRACT

Ashley D. Givens: Early Adult Involvement in the Criminal Justice System
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The United States boasts the world's highest rates of incarceration and community

supervision for individuals involved in the criminal justice system. Approximately 40% of these

individuals are early adults aged 18 to 29. However, little information is available on the

criminogenic risks and needs for this age group, even though this age group is less cognitively

developed than adults over age 30 which leads to higher impulsivity, lower reasoning, and

inhibited executive functioning. Moreover, individuals involved in the criminal justice system

experience trauma at rates substantially higher than the general population. Traumatic

experiences are associated with impulsivity, substance use, lower reasoning, and violent

reactions. This three-paper dissertation provides foundational information about the criminogenic

risk and needs, as well as the traumatic experiences, for early adults. Paper one is a systematic

review of trauma-informed interventions used with justice-involved populations. Paper two uses

administrative data to explore criminogenic needs among early adult probationers, as well as

nuances of criminogenic need based on gender and mental health symptomology. Paper three

uses primary data collected from probationers with serious mental illnesses to assess the extent to

which trauma is present among this high-risk, high-need population. Results show that little

research is focusing on how early adults have unique needs separate from older adults.

Additionally, few trauma-informed programs are being successfully implemented with justice-

involved populations. Findings also suggest a need for trauma-informed programs to be provided

within the criminal justice system, as well as programming focused on criminogenic needs responsive to the unique needs of females and individuals with mental health symptoms. Implications are discussed related to future programming for criminal justice populations served by social workers, early adults' needs, and the presence of trauma and criminogenic needs among justice-involved populations with mental health needs.

To my mom, dad, and sister—my never-ending support

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"A journey begins with a single step." These words express perfectly how my life's journey has brought me to this point. My mother and father took the step to provide me with the confidence and passion to follow my dreams. Without their unrelenting support of my dreams, I would not have completed this degree. The two of them and my sister have been my biggest support system along the journey that often seemed impossible. I cannot thank them enough for their patience and willingness to walk with me through this journey.

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LIST OF ABBREVIATIONS

α	Cronbach's alpha
AIC	Akaike Information Criterion
b	Beta regression coefficient
BIC	Bayesian Information Criterion
BJS	Bureau of Justice Statistics
BSI	Brief Symptom Inventory
CAPS	Clinician Administered PTSD Scale
CBT	Cognitive Behavioral Treatment
CINAHL	Cumulative Index of Nursing and Allied Health Literature
CTQ	Childhood Trauma Questionnaire
d	Cohen's d effect size
DAPS	Detailed Assessment of Posttraumatic Stress
DPS	Department of Public Safety
DRRI	Dual Role Relationship Inventory
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders
EMDR	Eye Movement Desensitization and Reprocessing
FBI	Federal Bureau of Investigation
FSSQ	Functioning Social Support Questionnaire
GED	General Equivalency Degree
GSI	Global Severity Index
IRB	Institutional Review Board

irr	Incidence Rate Ratio
K	Number of articles ("*k*" indicates subsample)
LEC	Life Events Checklist
LS/CMI	Level of Service/ Case Management Inventory
LSC-R	Life Stressor Checklist-Revised
MINI	Mini-International Neuropsychiatric Interview
N	Number of participants ("*n*" indicates subsample)
NC DPS	North Carolina Department of Public Safety
OLS	Ordinary Least Squares regression
OR	Odds Ratio
p	Probability
PCL-C	PTSD Checklist-Civilian version
PDS	Posttraumatic Stress Diagnostic Scale
PSS	Posttraumatic Stress Disorder Symptom Scale
PTCI	Posttraumatic Cognitions Inventory
PYS	Parental Psychological Maltreatment Scale
PTSD	Posttraumatic Stress Disorder
r	Correlation coefficient
RCT	Randomized control trial
RNA	Risk Needs Assessment
RNR	Risk Need Responsivity
SAMHSA	Substance Abuse and Mental Health Services Administration
SCL-R	Symptom Checklist Revised

SD	Standard Deviation
TAA	Trauma Assessment for Adults-Modified
TARGET	Trauma Affect Regulation: Guide for Education and Treatment
TAU	Treatment as Usual
TREM	Trauma Recovery and Empowerment Model
TSI	Trauma Symptom Inventory
THQ	Trauma History Questionnaire
TSC-40	Trauma Symptom Checklist
VIF	Variance Inflation Factor
x^2	Chi-square test statistic

INTRODUCTION

EARLY ADULTS INVOVLED IN THE CRIMINAL JUSTICE SYSTEM: TRAUMA, CRIMINOGENIC RISK AND NEED, AND LIFE STRESSORS

The issue of mass incarceration, and high rates of correctional supervision overall (i.e., jail/prison, probation, and parole), is at the forefront of current U.S. political and cultural discourse climate. Not only does the United States have the highest rate of incarceration in the world, at 459 out of 100,000 individuals, approximately 1.5 million, incarcerated in jails or prisons, another five million individuals are on parole or probation (Bureau of Justice Statistics [BJS], 2018). The trend toward high rates of incarceration and community supervision has grown at a staggering rate over the past four decades to reach an all-time high in the mid-2000s (The Sentencing Project, 2015). If these trends continue to go unabated, the U.S. criminal justice system will maintain its status as having one of the most overcrowded penal systems in the world.

The social work profession is especially poised to address this troubling trend of high rates of correctional supervision. Through the twelve grand challenges of the profession, social work has endeavored to reduce mass incarceration in smart, multidisciplinary, holistic ways thereby decreasing the number of individuals under correctional supervision in the United States (Pettus-Davis & Epperson, 2015). Beyond just incarceration, social workers must work toward successful probation completion, re-entry into communities, and reduction in recidivism. In meeting the challenge of reducing the overall number of individuals under correctional supervision, intervening with early adult offenders to disrupt their criminal trajectories is a viable

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strategy towards reducing the number of individuals under correctional supervision.

Early Adults under Correctional Supervision

Early (18-29 year olds) adults account for approximately 40% of all arrests each year, or approximately 3.5 million arrests (Federal Bureau of Prisons, 2016b). This is a higher proportion than any other 10-year age range: under 18 year olds account for 8% of arrests, 30-39 year olds account for 23% of arrests, 40-49 year olds account for 14% of arrests, 50-59 year olds comprise 9% of arrests each year, and individuals 60 and older account for less than 3% of arrests made each year (The Federal Bureau of Investigation [FBI], 2016). The age-crime curve suggests that adolescents who continue to engage in criminal behavior into adult will naturally desist this behavior around age 19 or 20 (Loeber, Farrington, & Petechuk, 2013), and much literature around young adults focuses on what happens until age 25. However, 18-24 year olds account for 26% of arrests each year and 25-29 year olds account for 17% (FBI, 2016), indicating a need for consideration to be made for 25-29 year olds considering the current rates of arrest for this age group.

Moreover, early adulthood is a time frame full of significant life events and milestones, such as educational attainment, establishing a career trajectory, and asserting independence from a family of origin (Arnett, 2007). Early adults involved in the criminal justice system are delayed in their ability to achieve these milestones. Furthermore, for the early adults who continue their justice involvement, they experience a lifetime of poor outcomes including lower educational attainment and substance abuse (Barr et al., 2012; Chung, Little, Steinberg, & Altschuler, 2005; Cohen & Piquero, 2009; Ryan, Williams, & Courtney, 2013; Windle & Wiesner, 2004), and homelessness (Travis, Western, & Redburn, 2014). Based on the understanding of cognitive development, lifespan events, and rates of justice involvement, it is imperative for research to

include all early adults in order to better understand how current cultural phenomenon are impacting criminal behavior. Understanding the needs for this sizeable portion of early adults involved in the criminal justice system is essential for successfully reducing the high rates of criminal justice involvement and the adverse sequela that result from justice involvement.

Mental illnesses and criminal justice involvement

Mental illness is substantially overrepresented among justice-involved populations. Approximately 119,000 individuals in jail, 250,000 prisoners, and 1.82 million people on probation experience mental illnesses compared to about 37,000 individuals receiving treatment at state hospitals (Crilly, Craine, Lamberti, Brown & Friedman, 2009; Ditton, 1999; Steadman, Osher, Robbins, Case, & Samuels, 2009). For early adults, the disproportionate number of individuals in the justice system experiencing mental illnesses is even more drastic. The rate differences for 18-22 year olds is 4.36% of jail inmates who experience mental illnesses whereas only 1.94% of the general population does; for 23-27 year olds rates are 6.99% versus 1.65%, and for 28-32 year olds the rates are 10.8% compared to 2.36% (Teplin, 1990). High rates of mental health needs among justice-involved populations creates challenges for the criminal justice system in regards to training, housing, and the supervision of this population.

Experiences of trauma among justice populations

A large portion of justice-involved individuals also have experienced a traumatic life event or experience symptoms of trauma. Traumatic life events can include natural disasters, transportation accidents, assault, or illness, among others (Gray, Litz, Hsu, & Lombardo, 2004), and symptoms or reactions can include feelings of helplessness, anxiety, impulsivity, anger, and irritability (Bloom, 1999; Wallace, Conner, & Dass-Brailsford, 2011). Research consistently shows that justice-involved samples experience far greater rates of trauma compared to the

general population (Donley et al., 2012; Goff, Rose, Rose, & Purves, 2007). Prevalence

estimates of trauma among justice-involved populations vary significantly due to differing

samples and inconsistency in how trauma is defined and measured (i.e., different aspects of

trauma measured over different time frames). Furthermore, there are no nationally representative

samples in which trauma exposure has been measured in order to provide a national prevalence

estimate of the extent to which trauma is present across justice-involved populations.

Nevertheless, estimates of trauma among justice-involved individuals range from 4% to 42%

(Anderson, Geier, & Cahill, 2016; Donley et al., 2012; Goff et al., 2007). Moreover, estimates of

the presence of traumatic experiences are greater for justice-involved females (58%; Martin,

Eljdupovic, McKenzie, & Colman, 2015) and individuals with mental illnesses (68%; Brown,

Gilman, Goodman, Adler-Tapia, & Freng, 2015). Although estimates vary substantially, it is

clear that justice-involved individuals experience higher rates of trauma compared to the general

population, and therefore, trauma-informed practices should be used within the criminal justice

system.

Criminogenic Risk Measurement

Bonta and Andrews (2007) identified eight central areas of criminogenic risk that are

associated with reoffending: (1) attitudes favorable of criminal behavior, (2) antisocial

personality traits, (3) peers engaged in procriminal behavior or thinking, (4) criminal past, (5)

low educational attainment or limited employment, (6) unstable family or marital relationships,

(7) substance use, and (8) lack of prosocial leisure activities. Four of these areas are identified as

the "Big Four" risk factors that account for substantial variance in recidivism (i.e., antisocial

associates, antisocial cognitions, antisocial personality patterns, and history of criminal behavior)

and are primarily used to assess risk for reoffending. These eight criminogenic risk areas are key

components of the Risk-Need-Responsivity (RNR) framework of criminal offending and rehabilitation (Andrews & Bonta, 2010).

The RNR posits that assessing these areas for justice-involved individuals is imperative when considering interventions. The Risk principle asserts that level of services should match the level or risk for reoffending, for example, individuals at highest risk for reoffending should receive the most intense treatment whereas individuals at low-risk should receive lower level services. The Need principle posits that measurement of risk areas will identify malleable targets within the criminogenic risk area to target for treatment, and these should be the focus of treatment. The Responsivity principle within the RNR asserts that cognitive based interventions are most effective and that subgroups of justice-involved populations may react to programming uniquely and treatment should recognize the needs of subgroups (e.g., females, individuals with mental illnesses; Bonta & Andrews, 2007). Adhering to this framework is one way to maximize treatment effectiveness and successfully reduce the risk of reoffending.

Organization of the Dissertation

This dissertation includes three papers that review the experiences of early adults involved in the criminal justice system. Papers were prepared to be standalone papers around a central theme and therefore, contain similar information when necessary. The first paper is a systematic review geared toward identifying current practices, measurement, and prevalence rates around traumatic experiences of justice-involved individuals. Paper two uses administrative data to explore relationships between age, criminogenic risks and needs, gender, and mental health symptomology among early adults and older adults supervised on community probation. Paper three is an exploratory, cross-sectional study that identifies rates of trauma among probationers with severe and persistent mental illnesses. The dissertation concludes with a

discussion about the connections between the findings from all three studies and implications at

the interface of social work and criminal justice for future practice, research, and policy with

justice-involved early adults.

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PAPER 1

TRAUMA AND EARLY ADULTS INVOLVED IN THE CRIMINAL JUSTICE SYSTEM: A
SYSTEMATIC REVIEW

Abstract

Criminal justice involvement is one of the most salient public safety issues facing the

United States. The country houses a higher rate of individuals in correctional facilities than any

other country. Approximately 40% of individuals involved in the justice system are early adults

between the ages of 18 and 29 who account for a higher proportion of justice-involvement than

any other ten-year age range. One way to address the high rates of justice involvement is to

identify criminogenic risk and need levels of individuals and implement programming to address

these needs. Oftentimes, traumatic experiences result in impulsivity, lower emotion regulation,

and anxiety all of which can be precursors to criminal behavior and heighten criminogenic risk.

Trauma-informed interventions have the potential to reduce criminal behavior for justice-

involved individuals who have experienced traumatic events. This systematic review synthesizes

the published literature on trauma-informed interventions used with justice-involved samples.

Twenty articles are reviewed that evaluate the effectiveness of trauma-informed interventions on

reducing trauma symptoms or criminal justice outcomes. Findings reveal that individuals who

participated in a trauma-informed intervention experienced lower rates of trauma symptoms and

were less likely to recidivate within the follow-up period.

Introduction

The large number of Americans under correctional supervision across the country is a great public health and public safety challenge that the United States continues to face. As of 2016, 459 individuals per every 100,000, or approximately 1.5 million, were housed in either federal or state prisons (Bureau of Justice Statistics [BJS], 2018). Additionally, another 1 in 53 adults, or 4.6 million, were under community supervision (i.e., probation or parole; BJS, 2017). These numbers represent a slight decrease from the previous year; however, the rates are still significantly higher than any other country (The Sentencing Project, 2015). Early adults (18-29 year olds) makeup a substantial portion of the individuals under correctional supervision, and as such create an opportunity for the criminal justice system to focus programming on this age group to reduce the numbers of individuals under correctional supervision in a targeted and impactful way (FBI, 2016). Furthermore, individuals in the criminal justice system experience higher rates of trauma than general populations (Donley et al., 2012; Goff, Rose, Rose, & Purves, 2007). Considering the large number of adults within the criminal justice system, it is imperative to address the trauma experienced by so many people, both before they enter the criminal justice system and once they make contact with the justice system.

The high rates of incarceration and community supervision create large financial expenditures for corrections departments. In 2015, the total expenditures for prison were $43 billion among 45 states housing 1.29 of the 1.33 million inmates (Mai & Subramanian, 2017). Although the overall cost is high, the price per inmate and the price per state resident provides a clearer picture of spending trends. The average annual cost per inmate in 2015 was $33,274 and the cost per state resident averaged $137 (Mai & Subramanian, 2017). In addition to the costs of providing correctional supervision, victims of crimes experience significant financial burdens.

Tangible (i.e., victim, criminal justice, and career criminal costs) and intangible (i.e., pain and suffering and corrected risk of homicide) costs to society range from $42,310 for robberies to $9 million for murders (McCollister, French, & Fang, 2010). Considering the large proportion of U.S. adults under correctional supervision, these financial expenses are exorbitant and create burdens to society in numerous ways. The high cost of housing incarcerated individuals leads to a need for understanding root causes of behavior and implementing effective, efficient programming to alleviate the financial, among others, burdens of incarceration.

Theories of Criminal Behavior

The debate between structural causes versus individual causes of criminal behavior has existed for decades (Bonta & Andrews, 2017). Research has supported the existence of numerous risk factors that contribute to criminal offending. Some of the known risk factors include poverty (Barrett & Katsiyannis, 2015; Jarjoura, Triplett, & Brinker, 2002; Pagani, Boulerice, Vitaro, & Tremblay, 1999), having family members or acquaintances involved in the justice system (Farrington, Ttofi, & Piquero, 2016; Mann et al., 2016), and lower educational attainment (Farrington et al., 2016). Theoretical explanations further hypothesize about the root elements of engaging in criminal behavior. Social Disorganization Theory asserts that high prevalence of crime is associated with neighborhood characteristics such as high poverty, abandoned houses, transient residents, underfunded schools, and ethnic diversity (Hartinger-Saunders & Rine, 2011; Kurbin & Weitzer, 2003; Steenbeek & Hipp, 2011). Moreover, weak social ties within these communities creates an environment where crime is more likely to occur (Kurbin & Weitzer, 2003). General Strain Theory posits that crime occurs whenever individuals are treated in undesirable ways in regards to asset or wealth accumulation, friendship development and sustainability, or familial relationships and subsequently they make a decision

to release that strain through whatever means necessary, often illegal actions (Agnew & Brezina, 2012). Theories of criminal behavior have begun to shift toward a more integrative approach that combines structural influences with individual correlates of criminal behavior. Andrews and Bonta (2017) assert that specific areas influence crime and that risk factors arise in psychological, social, and biological domains. The move toward a more holistic view of potential influencers of criminal actions has led to the development of a framework to understand and assess risk for criminal behavior.

The Risk-Need-Responsivity (RNR) Framework

One way to identify propensity toward criminal behavior is through measurement of criminogenic risk factors. Eight risk areas substantially increase the likelihood of engaging in criminal behavior: (1) attitudes favorable of criminal behavior, (2) antisocial personality traits, (3) peers engaged in procriminal behavior or thinking, (4) criminal past, (5) low educational attainment or limited employment, (6) unstable family or marital relationships, (7) substance use, and (8) lack of prosocial leisure activities (Andrews & Bonta, 2010). These eight areas are core to the Risk-Needs-Responsivity (RNR) framework of criminal rehabilitation. The RNR framework posits that measurement of these eight criminogenic risk factors is vital to successfully targeting services to criminal offenders.

Principles of the RNR framework provide guidance to influence the development of services for those who exhibit criminal behavior or become involved with the criminal justice system. Based on the RNR framework, the level and intensity of services should match an individual's risk level for reoffending (i.e., the Risk Principle of the RNR; Bonta & Andrews, 2007). For example, the individuals who score at the highest risk for reoffending should be targeted more heavily for intensive services than those who pose a lower risk of recidivism. The

principle asserts that whenever low-risk offenders are placed in high-risk treatment settings and programs, their criminality risk might actually increase (Andrews & Bonta, 2017).

The second principle of the framework, The Need Principle, asserts that treatment should target malleable behaviors within each of the criminogenic risk areas (e.g., increasing the number of prosocial associates with whom someone interacts). Addressing the malleable behaviors (i.e., an individual's needs) creates the opportunity to change behavior, thereby reducing the level of risk in each of the criminogenic areas. These risk areas include treatment targets with changeable, measureable constructs that programming can focus on to influence more prosocial behavior. Lastly, the Responsivity Principle of the RNR framework posits that certain subpopulations (e.g., females, individuals with mental health needs, etc.) may respond to treatments differently and programs should target these differences in order to produce the most successful outcomes (Bonta & Andrews, 2007; Vitopoulos, Peterson-Badali, & Skilling, 2012). Measuring these areas is essential to treating justice-involved individuals with the goal of reducing subsequent criminal acts.

Consequences of Criminal Justice Involvement

Making contact with the criminal justice system increases the likelihood of continued justice involvement and incarceration (Barr et al., 2012; Ryan, Williams, Courtney, 2013). Furthermore, justice-involved individuals are at increased risk of lower educational attainment and substance abuse (Barr et al., 2012; Chung, Little, Steinberg, & Altschuler, 2005; Cohen & Piquero, 2009; Ryan, Williams, Courtney, 2013; Windle & Wiesner, 2004), as well as homelessness (Travis, Western, & Redburn, 2014). Justice-involved individuals also are more likely to experience poor health (Travis, Western, & Redburn, 2014) and unstable relationships (Barr et al., 2012; Chung, Little, Steinberg, & Altschuler, 2005; Cohen & Piquero, 2009; Ryan,

Williams, Courtney, 2013; Travis, Western, & Redburn, 2014; Windle & Wiesner, 2004). Poor outcomes of justice-involved individuals create undue burdens on these individuals, families, and communities, and whenever justice contact occurs early in life and continues throughout adulthood, individuals are at risk for these burdens for extended periods of time which provides an opportunity for increased harm.

Early Adulthood and Criminal Justice Involvement

The earlier someone makes contact with the justice system, the longer opportunity across their lives there is for these negative outcomes to further impede successful adult functioning. Early adults (aged 18-29 years) constitute a significant portion of the criminal justice population, more than any other 10-year age grouping (FBI, 2016). This age group represents over 40% of the criminal justice population, or approximately 3.5 million individuals, and between 29-58% of new arrests for each type of crime reported by the FBI Uniform Crime Report (2016). Conversely, under 18-year olds account for 8% of arrests, 30-39 year olds account for 23% of arrests, 40-49 year olds account for 14% of arrests, 50-59 year olds comprise 9% of arrests each year, and individuals 60 and older account for less than 3% of arrests made each year (FBI, 2016). Although criminal behavior naturally peaks around age 19-20 before steadily decreasing for a large portion of offenders (Loeber, Farrington, & Petechuk, 2013), the 18-29 year-old time frame often includes behaviors that confirm the path to either lifelong recidivism or desistence from criminal behavior (Hoge, Vincent, & Guy, 2013). Moreover, a portion of individuals begin their criminal offending behavior during the 20 to 29 year-old time frame (Hoge, Vincent, & Guy, 2013; Piquero, Hawkins, & Kazemian, 2012). Additionally, for the individuals who persist with criminal actions, the severity and violence of the committed crimes increases during early adulthood (Loeber & Farrington, 1998).

Individuals in early adulthood are engaging in criminal behavior at an early age and thus primed to experience the aforementioned adverse outcomes earlier, and longer, than older adults merely because of how young they are and how much lifespan is yet to come. This time frame is a vital developmental period with a tremendous number of developmental milestones occurring (Arnett, 2007), and individuals involved in the justice system are in environments that hinder their natural development and ability to establish prosocial support systems on par with their same age peers. Early adults in the general population experience multiple residence changes, relationship formation and dissolution, and shifting social support (Arnett, 2007; Arnett, Zukauskiene, & Sugimura, 2014); however, when early adults are within the justice system these natural life events are substantially more difficult to navigate. Considering the sizable number of early adults involved in the criminal justice system and the major milestones that occur during this time frame, it is crucial to understand the effects previous trauma has on criminal behavior among this cohort.

Trauma and Criminal Justice Involvement

Prevalence. The number of individuals under correctional supervision who have been exposed to trauma (defined as, experiencing, witnessing or being threatened with serious injury, death, or bodily harm and responding with intense fear, helplessness, or horror; Wallace, Conner, & Dass-Brailsford, 2011) in their lifetimes is significant, and far greater than the portion of the general population who report experiences of trauma (Donley et al., 2012; Goff, Rose, Rose, & Purves, 2007). However, prevalence estimates of trauma within the criminal justice system vary considerably, thus creating a strain on researchers' and practitioners' abilities to identify and treat trauma within the criminal justice system. Estimates suggest that between 4% to 42% of justice-involved individuals have experienced at least one traumatic event in their lifetime or

meet criteria for PTSD (Anderson, Geier, & Cahill, 2016; Donley et al., 2012; Goff, Rose, Rose, & Purves, 2007). Estimates are even greater for female offenders and those individuals with mental illness. For women, estimates of trauma range between 28% (Goff et al., 2007) to 58% (Martin, Eljdupovic, McKenzie, & Colman, 2015) and for individuals with mental illnesses traumatic event prevalence is estimated to be as high as 68% (Brown, Gilman, Goodman, Adler-Tapia, & Freng, 2015). These discrepancies in estimates can be attributed to multiple factors, among which include varying sampling strategies, varying locations, and, most importantly, variations in measurement tools used to assess trauma. Despite the wide range of prevalence estimates, it is critical to better understand the link between trauma and criminal behavior in order to address the substantial amount of trauma within and burden on the criminal justice system.

Traumatic experiences have an impact on development during early adulthood as well. Children who experience adverse events are at increased risk of developing personality disorder traits during early adulthood (Johnson, Cohen, Brown, Smailes, & Bernstein, 1999). Furthermore, unique traumatic experiences are associated with increased risk of different mental health needs and experiences during early adulthood. Specifically, childhood neglect has been associated with traits during early adulthood such as avoidance, narcissism, paranoia, and passive-aggressive behavior (Johnson et al., 1999). Whereas, childhood sexual abuse has been shown to be associated with PTSD diagnosis during adulthood (McCutcheon et al., 2010) as well as depression and substance use (Hedtke et al., 2008). Many of these behaviors and symptoms that result from trauma are present in criminal justice-involved samples.

Trauma symptoms. Symptoms of experiencing a traumatic event often mirror behaviors that are precursors to criminal activity. Trauma theory asserts that once someone experiences a

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traumatic event their ability for emotional and behavioral regulation is damaged in multiple ways (Bloom, 1999). Furthermore, the more traumatic events experienced, the more likely someone is to develop symptoms related to depression, dissociation, and/or PTSD (Martin, Cromer, DePrince, & Freyd, 2013). Traumatic experiences increase irritability, exaggerated startle responses, anger, aggression, impulsivity, and anxiety (Bloom, 1999). Additionally, negative thought patterns, inability to concentrate, emotional numbing, violent reactions, and impaired thinking is likely to occur after a traumatic event (Bloom, 1999; U.S. Department of Veterans Affairs, 2015). Many of these same behaviors, including being aggressive, impulsivity, sensation-seeking, and poor emotional regulation, are precursors to risky, often criminal, behaviors (Andrews & Bonta, 2017).

Measurement of trauma. A significant number of assessment tools exist that are related to trauma (The National Child Traumatic Stress Network, n.d.) and there is no standard tool used to assess trauma uniformly across populations, especially within the criminal justice system (SAMHSA, 2014). Oftentimes, a single measurement tool does not comprehensively assess all constructs within trauma, for example, the Posttraumatic Diagnostic Scale (PDS) measures PTSD symptom clusters, whereas the Trauma History Questionnaire (THQ) assesses experiences of trauma in the respondent's history (SAMHSA, 2014). Another important, often excluded, distinction is the prevalence of traumatic event occurrences versus presence of trauma symptoms. Assessment tools may measure both events and symptoms or only one of these, and often it is not clear whether prevalence estimates overall are reporting events, symptoms, or both.

Furthermore, tools vary in the time frame in which they measure trauma (SAMHSA, 2014). For example, the Life Events Checklist (LEC) assesses exposure to traumatic events over the lifetime (Gray, Litz, Hsu, & Lombardo, 2004), while the Clinician Administered PTSD Scale

(CAPS) focuses in on symptoms in the last week related traumatic experiences that may have occurred recently or during the lifetime (Weathers et al., 2013). Additionally, these assessment tools are often validated with veterans, sexual assault survivors, and child abuse survivors in the general community and not with criminal justice populations (SAMHSA, 2014). Inconsistencies among trauma constructs measured and time frame assessed create complications in understanding the depth and breadth of traumatic exposure across samples. As definitions of trauma evolve, as well as criteria for a diagnosis of PTSD, it is important to move research forward on this topic as well.

Considering the high prevalence of traumatic experiences among justice-involved populations, it is vital to address trauma through both criminal justice system policies and practices. In regards to rehabilitating criminal behavior, criminal justice often includes sentences of completing specific treatment programs targeting individual behaviors (e.g., drug court or inpatient treatment for substance use). However, few treatment modalities incorporate programming that addresses underlying trauma experienced prior to, or during, justice involvement in an effort to reduce subsequent criminal behavior. The connection between trauma symptoms and the core criminogenic risk factors identifies a point of intervention to address underlying correlates of criminal behavior such as impulsivity, poor reasoning, and sensation-seeking behavior (Andrews & Bonta, 2017; Bloom, 1999). Interventions addressing trauma are limited, and of those that exist, few are developed specifically to address trauma within justice populations. This is a significant gap in efforts to address criminal behavior and reduce recidivism among justice-involved populations considering the high prevalence of traumatic experiences among justice-involved populations.

Trauma-informed Interventions

Few evidence-based practices exist that treat trauma among justice-involved populations. And those that do exist, are limited in scope and implementation within correctional settings. According to a 2017 report (Adams, Houston-Kolnik, & Reichert, 2017), six evidence-based treatment models have been adapted to be used with corrections populations: (1) Seeking Safety (Treatment Innovations, 2016), (2) Trauma Affect Regulation: Guide for Education and Treatment (TARGET; Advanced Trauma Solutions, n.d.), (3) Trauma Recovery and Empowerment Model (TREM; SAMHSA, 2016), (4) Sanctuary Model (Bloom, 2018), (5) Prolonged Exposure Therapy (U.S. Department of Veteran's Affairs, 2017), and (6) Eye Movement Desensitization and Reprocessing (EMDR; EMDR Institute, 2018). However, many of these programs were developed for specific populations (e.g., individuals with mental health needs, females, those with substance use disorders) and not specifically for justice-involved individuals (Adams, Houston-Kolnik, & Reichert, 2017).

Moreover, significant gaps exist in the literature about the understanding and treatment of trauma within the criminal justice system. First, prevalence estimates of traumatic experience among justice-involved populations are substantially different from study to study. Furthermore, consistency in measurement of trauma experiences, specifically measurement of traumatic events versus measurement of trauma-related symptomology, is sorely lacking. Lastly, there is no information on efforts to address trauma and criminal behaviors among early adults who are involved in the criminal justice system. Considering the significant portion of the justice population who are between 18 and 29 years old, understanding the role of trauma and how to address it is vital to disrupting the criminal trajectories of these individuals.

Current Study

The current review synthesizes the literature related to trauma-informed practices with justice-involved populations, specifically early adults (18-29 years) and identifies practices used to reduce recidivism among this justice populations, as well as gaps in the current literature in an effort to synthesize how trauma-informed practices in justice settings can best be moved forward. The review has five research questions: (1) What trauma-informed practices are used and what specific aspects of trauma are targeted? (2) What measurement tools are used in intervention studies to measure trauma among justice-involved populations? (3) To what extent is trauma present among justice-involved populations in intervention studies? (4) What efforts exist to treat trauma among justice-involved early adults? and (5) Do trauma-informed practices effect recidivism or trauma symptoms among criminal justice populations?

Methods

Systematic Review Protocol

In accordance with Cochrane collaboration guidelines for systematic reviews (Higgins & Green, 2011), a review protocol outlined the procedures to be followed during the review. The protocol was reviewed by secondary reviewers, as well as a research librarian to ensure inclusion of appropriate databases, keywords, and search terms. Colleagues with expertise in criminal justice research were consulted to receive additional feedback regarding the possible databases and keyword search terms. Through this iterative process of review with knowledgeable colleagues, the final systematic review protocol was established. Additionally, the protocol was submitted to Prospero and is available to the public (ID: CRD42018087230).

Eligibility criteria. To identify the state of the literature on trauma-inclusive interventions used with criminal justice populations, this review limited items to those published

in peer-reviewed sources. Further, studies had to meet the following inclusion criteria: (a) evaluated an intervention that focused on trauma exposure or symptoms in some capacity; (b) included a sample of individuals involved in the criminal justice system; (c) assessed some marker of criminal justice involvement (e.g., recidivism, arrest) or trauma as an intervention outcome; and (d) the average age of the sample was above 18. Initially, the scope of the systematic review was to include only early adults (i.e., average age between 18-29 years), however, only one study fell into this age range (Styron et al., 2006). Consequently, studies were included if the average age fell within one standard deviation of the target age range. Articles were excluded if the study did not include a comparison group or pre-/post-test comparisons, or if the article was not empirical in nature (e.g., only described an intervention).

Databases, keywords, and search string parameters. Databases were identified based on their inclusion of criminal justice focused research. All databases were accessible through university library systems in which access to the full text of the article was possible. The search included seven databases: *CINAHL, Academic Search Premier, PsycInfo, Social Work Abstracts, Criminal Justice Abstracts, ProQuest Applied Social Sciences Index & Abstracts,* and *PubMed.* Keywords related to four domains: criminal justice ("criminal justice," "incarceration," "correctional supervision," "probation," "prison," or "community supervision"); intervention research ("intervention," "therapy," "program," or "treatment"); traumatic experience ("trauma," "traumatic event," "life stressor," or "PTSD"), and age ("early adult*," "young adult*," or "emerging adult*"). For databases that allowed additional search string parameters, parameters were set including: (a) peer reviewed, (b) empirical, and (c) age is adult or young adult

Screening and abstraction. The first author completed all initial searches and screened all titles and abstracts of the studies found within the searched databases. This process produced

a limited number of articles to be reviewed for full-text review. A total of 2,061 articles were retrieved from the seven electronic database searches (see Figure 1.1). After removing duplicates, 2,050 articles were screened at the title and abstract level to determine fit into inclusion criteria. All articles not immediately identifiable as needing to be excluded were reviewed in the full-text review step (k=54). These articles included ones that did not clearly articulate an intervention, trauma focus, or sample characteristics. Thirty-four articles were excluded during the full text review phase due to various reasons including lack of inclusion of trauma within the intervention (k=10), not focusing on or including a criminal justice-involved sample (k=3) and being an excluded research design (k=21; see Table 1.1). Following the full-text reviews, twenty articles were abstracted and included in the discussion of results (see Table 1.2). Articles were abstracted by two authors; the primary author abstracted all articles and then two secondary authors each abstracted half of the articles.

Key Findings

Key findings were abstracted across five domains: article characteristics information; design and sampling; intervention; presence, conceptualization, and measurement of trauma; and key outcomes related to trauma and recidivism. All abstraction items belonged to one of these categories and each category contained four to fourteen items.

Article characteristics. In order to identify the researchers, fields, and universities producing scholarly work related to trauma-informed interventions, abstraction included details found in article citations. Information included the journal in which the article was published, the discipline in which the authors work, and the year of publication.

Design and sampling. Methodological details were abstracted in an effort to identify the rigor of designs evaluating the effectiveness of trauma-informed interventions with correctional

populations. Abstracted information included details about group assignment, sample size and characteristics, sample affiliation with criminal justice, and randomization procedures.

Conceptualization and measurement of trauma. Abstraction included details about the assessment tool for measuring the prevalence of trauma among the sample. Based on the assessment tool, details about the amount of trauma present among the sample was abstracted. Abstracted elements included the name of the assessment tool, markers of reliability and validity, the specific constructs of trauma that the tool measured, whether PTSD was diagnosed, and the time frame in which trauma was assessed.

Intervention. The most important aspect of replicability is the ability to clearly understand steps taken to produce a result. As such, details of the intervention are vital to understanding the specific mechanisms of change the intervention uses to produce positive outcomes for participants. Details of the intervention were abstracted to identify what techniques are used within criminal justice settings to address trauma while simultaneously attempting behavioral change. Specific details such as the trauma-informed components of the intervention, the length of time the intervention took place, and the connection of the intervention to justice-involved populations.

Key outcomes related to trauma and recidivism. Finally, data were abstracted related to the key outcomes of trauma and recidivism. Information was abstracted related to the intervention's impact on both recidivism and a measure of trauma, if present. Recidivism markers included the time until recidivism, type of recidivism measured, and prevalence of recidivism for the treatment group.

Assessing Risk for Bias

In addition to the information collected about specific articles, data were abstracted to

assess each article for risk of bias. In line with Cochrane Collaboration's tool for assessing risk of bias (Cochrane Methods, 2018), five areas were assessed: selection bias, performance bias, detection bias, attrition bias, and reporting bias. Selection bias occurs whenever differences exist among the groups created for the study. Selection bias can result from failed randomization, no randomization, or self-selection into groups. Next, performance bias results from groups being exposed to factors outside the scope of the treatment program that could influence outcomes. One way to minimize performance bias is to create a blinding process in which research personnel are unaware of which condition a participant has received. Detection bias occurs whenever differences exist in how outcomes are determined for the groups. Again, a blinding process minimizes this risk. Next, attrition bias results from unequal discontinuation from the study between the treatment groups. Attrition creates uneven groups and outcome data for the groups. Lastly, reporting bias refers to bias in which results are reported. That is, when significant differences are reported, but non-significant findings are excluded from the report (Cochrane Method, 2018).

Each area of bias was assessed as high risk ("H"), low risk ("L"), or unclear risk ("U"). If information in the article included discussion around the bias area and adequate procedures were in place to reduce or control for bias, the article was coded as low risk for bias in the area. Articles that included no discussion of the bias topic, or no information needed to assess the bias area, were coded as unclear. Lastly, if the article clearly discussed an area and failed to meet criteria for not having bias in an area (e.g., no random assignment would indicate high selection bias), the article was coded as high risk for bias in the specific area.

Results

Article characteristics

Studies were published in fifteen different journals (see Figure 1.2). The most prevalent journal was *Research on Social Work Practice* (*k*=3, 15%). Each of the following journals published two articles: *Criminal Justice and Behavior*, *Journal of Anxiety Disorders*, and *Journal of the Society for Social Work Research*. Indicative of the relatively recent focus on treating trauma within the criminal justice system, all studies were published since 2001. Social work researchers were the most prevalent across the studies (*k*=8, 40%; see Figure 1.3). Other disciplines included: medicine-related fields (*k*=4, 20%), criminal justice or criminology (*k*=3, 15%), independent substance use researchers (*k*=2, 10%), psychology (*k*=2, 10%), and behavioral health researchers (*k*=2, 10%). Lastly, government/public service researchers (*k*=1, 5%) and community network service researchers (*k*=1, 5%) were present on one article each.

Design and Sampling

Design. Half of the studies reviewed were randomized controlled trials (*k*=10, 50%) and the rest were quasi-experimental in the form of either a one group pre- and post-test design (*k*=8, 40%), or a two group with no randomization design (*k*=2, 10%). For the twelve studies (60%) that included more than one group, group assignment procedures were inconsistently described. Nine studies (45%) explicitly stated that group assignment was made by random methods; however, these methods were not clearly articulated in many of the studies. Random assignment methods included utilizing a randomized list (Kubiak et al., 2004), envelope-based randomization (Messina, Calhoun, & Warda, 2012), assignment by prison identification numbers (Messina et al., 2010; Saxena, Messina, & Grella, 2014), sorting by release date (Kubiak et al., 2015), cohort-based randomization (Wolff et al., 2015), or randomization with no specific details

provided (Sacks et al., 2008; Valentine & Smith, 2001; Zlotnick, Johnson, & Najavits, 2009). One study (5%) divided participants into groups based on whether they had trauma exposure in their histories or not (Brown et al., 2015). Two studies (10%) did not provide sufficient information to ascertain the group assignment process.

Seventy percent of the individuals within the studies participated in a trauma-informed treatment condition (*n*=1,868). Eight studies (40%) were single-group studies and only included a treatment condition (Ball, Karatzias, Mahoney, Ferguson, & Pate, 2013; Cimino, Mendoza, Thielman, Shively, & Kunz, 2015; Kubiak, 2004; Kubiak, Kim, Fedock, & Bybee, 2012; Roe-Sepowitz, Bedard, Pate, & Hedberg, 2014; Ward & Roe-Sepowitz, 2009; Styron et al., 2006; Wolff, Frueh, Shi, & Schumann, 2012).

Sampling. A variety of criminal justice settings were reflected in the samples, including drug courts (*k*=2, 10%); prison populations (*k*=14, 70%); former inmates attempting to re-enter their communities (*k*=4, 20%); and previously incarcerated young adults involved in a young adult services program (*k*=1, 5%). One study (5%) used a sample from the community as well as an inmate sample.

Sample characteristics. The twenty reviewed studies included a total of 2,648 participants. The smallest sample included 19 participants in the analysis (Kubiak, Kim, Fedock, & Bybee, 2015) while the largest sample included 427 participants (Sacks, McKendrick, & Hamilton, 2012). Six studies (30%) included a sample of fewer than fifty participants (Ball et al., 2013; Kubiak et al., 2012; Kubiak et al., 2015; Kubiak et al., 2016; Ward & Roe-Sepowitz, 2009; Zlotnick, Johnson, & Najavits, 2009). Four studies' (20%) samples ranged from fifty to 100 participants (Cimino et al., 2015; Styron et al., 2006; Swopes, Davis, & Scholl, 2017; Wolff et al., 2012). Five studies (25%) included a sample between 101-200 participants (Kubiak, 2004;

Messina, Calhoun, & Warda, 2012; Messina et al., 2010; Saxena, Messina, & Grella, 2014). The

final five articles (25%) used a sample greater than 200 (Brown et al., 2015; Roe-Sepowitz et al.,

2014 Sacks, McKendrick & Hamilton, 2012; Sacks et al., 2008; Wolff et al., 2015).

The average age of participants fell between 20.4 years (Styron et al., 2006) and 42.5

years (Wolff et al., 2015), with all but these two samples consisting of participants with an

average age in the thirties. All studies included largely Caucasian samples, with the lowest

percentage of Caucasians in a study at 31.8% (Kubiak et al., 2015) and one study comprising of a

91% Caucasian sample (Cimino et al., 2015). Sixteen articles (80%) included all female samples,

whereas three studies (15%) included samples that were 40% or less female (Brown, Gilman,

Goodman, Adler-Tapia, & Freng, 2015; Kubiak, 2004; Styron et al., 2006) with one study (5%)

being a sample of all male participants (Wolff et al., 2015).

Measurement and Conceptualization of Trauma

Trauma measures. Trauma measures varied across the studies. Some studies (*k*=8, 40%)

used multiple markers of traumatic events or traumatic responses (Brown et al., 2015; Roe-

Sepowitz et al., 2014; Sacks, McKendrick, & Hamilton, 2012; Sacks et al., 2008; Swopes, Davis,

& Scholl, 2017; Wolff et al., 2012; Wolff et al., 2015; Zlotnick, Johnson, & Najavits, 2009),

whereas other studies (*k*=11, 55%) used one marker of trauma (Ball et al., 2013; Cimino et al.

2015; Kubiak, 2004; Kubiak et al., 2012; Kubiak et al., 2015; Messina, Calhoun, & Warda,

2010; Messina et al., 2010; Saxena, Messina, & Grella, 2014; Styron et al., 2006; Valentine &

Smith, 2001; Ward & Roe-Sepowitz, 2009).

In total, fifteen measures were used across the studies (see Figure 1.4). The most

commonly used measures were the Trauma Symptom Inventory (TSI) and the Trauma History

Questionnaire (THQ) each used by four studies (20%). Four measures each were used by three

different studies (15%): the Clinician Administered PTSD Scale (CAPS), the Posttraumatic Stress Diagnostic Scale (PDS), the Posttraumatic Stress Disorder Symptom Scale (PSS), and the PTSD Checklist-Civilian version (PCL-C). The Brief Symptom Inventory (BSI) was used twice (Sacks, McKendrick, & Hamilton, 2012; Wolff et al., 2015). The following measures were each used one time: the Detailed Assessment of Posttraumatic Stress (DAPS), Childhood Trauma Questionnaire (CTQ), Trauma Symptom Checklist (TSC-40), Parental Psychological Maltreatment Scale (PYS), Posttraumatic Cognitions Inventory (PTCI), Life Stressor Checklist-Revised (LSC-R), Global Severity Index (GSI), and Trauma Assessment for Adults-Modified (TAA). Two studies (10%) used a screening scale from the DSM-IV that was modified from PTSD criteria (Kubiak et al., 2012; Kubiak et al., 2015). One article (5%) did not report the measure used to obtain data about trauma (Kubiak et al., 2016) and one study (5%) used a subscale of the National Comorbidity Survey to assess presence of symptoms (Kubiak, 2004).

Timing of trauma. Six studies (30%) did not report the time frame in which trauma, or traumatic experiences, was assessed. Four studies (20%) used measures that assessed experience of trauma over the lifetime (Brown et al., 2015; Kubiak, 2004; Swopes, Davis, & Scholl, 2017; Wolff et al., 2012). Three studies (15%) assessed current PTSD symptoms of their participants (Kubiak et al., 2012; Kubiak et al., 2012; Wolff et al., 2015). Four studies (20%) assessed trauma by using a time frame associated with childhood: two (10%) assessed childhood only (Roe-Sepowitz et al., 2014; Styron et al., 2006) and two (10%) assessed traumatic experience before and after age fourteen (Sacks, McKendrick, & Hamilton, 2012; Sacks et al., 2008). Lastly, studies assessed trauma within a specific time frame: last six months (k=2, 10%; Roe-Sepowitz et al., 2014; Ward & Roe-Sepowitz, 2012), over the last month (k=1, 5%; Ball et al., 2013). Cimino et al. (2015) use a tool to capture "chronic and acute stress" without specifying a

constrained time frame.

Constructs of trauma. In order to understand prevalence of trauma among justice populations, it needs to be clear how trauma is defined by the measurement tools used. Trauma measures were primarily focused around either symptomology or specific event experiences. Fifteen studies (75%) included measures of trauma symptoms (Brown et al., 2015; Ball et al., 2013; Cimino et al., 2015; Kubiak, 2004; Kubiak et al., 2012; Kubiak et al, 2015; Messina, Calhoun, & Warda, 2012; Roe-Sepowitz et al., 2014; Sacks et al., 2008; Saxena et al., 2014; Swopes, Davis, & Scholl, 2017; Valentine & Smith, 2001; Wolff et al., 2012; Wolff et al., 2015; Zlotnick, Johnson, & Najavits, 2009). Eleven studies (55%) assessed the number, or type, of traumatic events experienced (Brown et al., 2015; Kubiak, 2004; Messina, Calhoun, & Warda, 2012; Sacks, McKendrick, & Hamilton, 2012; Roe-Sepowitz et al., 2014; Sacks et al., 2008; Saxena et al., 2014; Styron et al., 2006; Swopes, Davis, & Scholl, 2017; Wolff et al., 2012; Zlotnick, Johnson, & Najavits, 2009). Finally, three studies (15%) also assessed the duration of trauma symptoms (Messina, Calhoun, & Warda, 2012; Saxena, Messina, & Grella, 2014) and level impairment of the traumatic experiences (Messina, Calhoun, & Warda, 2012; Saxena, Messina, & Grella, 2014; Swopes, Davis, & Scholl, 2017) in addition to trauma presence.

Reliability and validity. Reliability and validity are important parts of the measurement process. The studies included in this review overall reported at least one marker of reliability or validity. However, six studies (30%) did not report psychometric properties (Ball et al., 2013; Brown et al., 2015; Kubiak et al., 2016; Sacks, McKendrick, & Hamilton, 2012; Saxena, Messina, & Grella, 2014; Wolff et al., 2012) and an additional two (10%) stated that measures had adequate properties without reporting specifics (Wolff et al., 2015; Zlotnick, Johnson, Najavits, 2009). The reports which lacked psychometric properties included the following

measures: CAPS, DAPS, BSI, TSC-40, TAA, LSC-R, and GSI.

One measure, the THQ, demonstrated reliability below a desirable cutoff (test-retest=.65; Sacks et al., 2008). The TSI demonstrated acceptable reliability values across the studies with Cronbach alphas ranging of .62-.91 (Ward & Sepowitz, 2009) to .73-.94 (Swopes, Davis, & Scholl, 2017). The life events subscale of the National Comorbidity Survey demonstrated acceptable alternate forms reliability (.75; Kubiak, 2004). The remaining measures demonstrated acceptable reliability as well: PDS (test-retest=.70; Messina, Calhoun, & Warda, 2012; Messina et al., 2010), PSS (α=.92; Sacks et al., 2008), CTQ (α=.79-.94; Styron et al., 2006), PTCI (α=.94-.95; Swopes, Davis, & Scholl, 2017), and the screening tool aligned with the DSM-IV criteria for PTSD (α=.64-.76; Kubiak et al., 2012; Kubiak et al., 2015). Only one study mentioned validity, though they simply stated the measurement tool had "acceptable validity in the past" (Cimino et al., 2015).

Trauma presence. One primary outcome of interest was estimates of the proportion of the population experiencing trauma across the intervention studies. Of the articles reporting rates of traumatic experiences or trauma symptoms, the proportion of participants experiencing trauma ranged from 26% (as measured by the PDS; Messina et al., 2010) to 98% (as measured by the THQ; Sacks et al., 2008). Primarily, studies reported participants' experience of traumatic events. For the studies in which assessments measured prevalence of experiencing a traumatic event over the lifetime, estimates were 98% (Sacks et al., 2008), 97% (Sacks, McKendrick, & Hamilton, 2012), and 96% (Swopes, Davis, & Scholl, 2017).

Other studies further specified the types of traumatic event experienced. Participants experienced high rates of sexual abuse in childhood: 72% (Roe-Sepowitz et al., 2014), 78% (Ward & Roe-Sepowitz, 2009), and 26% (Wolff et al., 205). Additionally, in regards to adult

sexual abuse, Wolff et al., (2015) found that 3% of their sample experienced adult sexual abuse and Roe-Sepowitz et al. (2014) found that 34% of their sample had the experience. Physical abuse was also experienced by a substantial portion of the participants. Seventy-five percent of participants in the Wolff et al., 2015 study experienced physical trauma as a child. Similarly, 48% of the Roe-Sepowitz et al. (2014) sample and 61% of the Ward & Roe-Sepowitz (2009) sample experienced physical abuse as a child. Wolff et al. (2015) found that 10% of their sample had experienced adult physical abuse. Lastly, emotional abuse experienced during childhood was prevalent in 23% of one sample (Roe-Sepowitz et al., 2014) and 33% of a second sample (Ward & Roe-Sepowitz, 2009).

Six studies (30%) used a measure that assessed criteria for PTSD diagnosis. Of these studies, the proportion of individuals who could be, or were, diagnosed with PTSD ranged from 31% (Messina, Calhoun, & Warda, 2012) to 88% (Wolff et al., 2012). As for reports of trauma-related symptomology, studies reported 35% (Saxena, Messina, & Grella, 2014) and 26% of participants experienced symptoms related to trauma (Messina et al., 2010).

Five articles had no prevalence estimates of participants experiencing traumatic events or symptoms. However, one article solely included individuals who had experienced trauma, thus reporting 100% of participants experienced trauma-related symptoms (Cimino et al., 2015) and one article provided a general statement about participants experiencing a "moderate to severe" range of various types of abuse (Styron et al., 2006).

Interventions

Eleven (55%) of the reviewed studies used interventions that they identified as developed specifically for justice-involved populations (i.e., Beyond Violence, Helping Women Recover, Beyond Trauma, Young Adult Services programming, Seeking Safety, and Esuba). An

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additional four articles (20%) included evaluations of an intervention originally developed for community populations that was used with justice populations in the reviewed studies (i.e., Integrated Trauma Treatment Program and Challenge to Change), and the final five articles (25%) did not have a clear description of for whom the intervention was intended.

Seeking safety was the intervention most widely used (k=5, 25%; Brown et al., 2015; Sacks, McKendrick, & Hamilton, 2012; Sacks et al., 2008; Wolff et al., 2012; Zlotnick, Johnson, & Najavits, 2009). Four articles (20%) discussed the use of the intervention Beyond Trauma combined with Helping Women Recover (Messina, Calhoun, & Warda, 2012; Messina et al., 2010; Saxena, Messina, & Grella, 2014; Swopes, Davis, & Scholl, 2017). Likewise, four articles (20%) discussed Beyond Violence (Kubiak et al., 2012; Kubiak et al., 2015; Kubiak et al., 2016). Esuba was used in two studies (10%, Roe-Sepowitz et al., 2014; Ward & Roe-Sepowitz, 2009). Each of the following were used in one study (5%): the trauma recovery and empowerment model (TREM; Wolff et al., 2015), Trauma Incident Reduction (Valentine & Smith, 2001), Helping Women Recover singularly (Cimino et al., 2015), and Survive and Thrive (Ball et al., 2013). Two studies (10%) did not name a specific intervention or used an intervention that was a locally created program (Kubiak, 2004; Styron et al., 2006).

Intervention delivery. All intervention programs were delivered in-person. The majority of the programs provided services for eight (Ball et al., 2013) to 48 sessions (Swopes, Davis, & Scholl, 2017). Ball et al. (2013) discussed the shortest program at eight sessions. Four articles (20%) included a program that occurred for 12-17 sessions (Brown et al., 2015; Cimino et al., 2015; Roe-Sepowitz et al., 2014; Ward & Roe-Sepowitz, 2009). Three studies (15%) used an intervention lasting 20 sessions (Kubiak et al., 2012; Kubiak et al., 2015; Kubiak et al., 2016). Twenty-eight was the modal number of sessions (k=5, 25%; Messina, Calhoun, & Warda, 2012;

Messina et al., 2010; Saxena, Messina, & Grella, 2014; Wolff et al., 2012; Wolff et al., 2015).

One study (5%) used an intervention lasting between 18-24 sessions (Zlotnick, Johnson, &

Najavits, 2009) and one study (5%) assessed an intervention lasting for 48 sessions (Swopes,

Davis, & Scholl, 2017).

Though most studies reported number of sessions, some studies reported intervention

duration in terms of months spent in the program. Kubiak (2004) conducted the program for six

to nine months, two studies (10%) provided programming for six months (Sacks, McKendrick, &

Hamilton, 2012; Sacks et al., 2008), and Styron et al. (2006) participants spent an average of

20.25 months in the program. One study (5%) did not report the length of time in the program

(Valentine & Smith, 2001). When described, group sessions were held either weekly (Brown et

al., 2015; Kubiak et al., 2012; Kubiak et al., 2015; Kubiak et al., 2016; Roe-Sepowitz et al.,

2014; Ward & Roe-Sepowitz, 2009), bi-weekly (Wolff et al., 2012; Wolff et al., 2015), or three

times a week (Swopes, Davis, & Scholl, 2017; Zlotnick, Johnson, & Najavits, 2009). Two

studies (10%) assessed programming that provided therapeutic activities daily (Sacks,

McKendrick, & Hamilton, 2012; Sacks et al., 2008).

Trauma component. Two studies (10%) did not discuss the specific components of the

treatment that addressed trauma (Cimino et al., 2015; Kubiak, 2004). Two articles (10%)

identified Seeking Safety as the treatment modality but did not provide specific details on the

components of the intervention (Sacks, McKendrick, & Hamilton, 2012; Sacks et al., 2008). Two

studies (10%) focused on a CBT-based integration of trauma symptoms and substance use

through either a manualized CBT program (Brown et al., 2015) or through case management

focused on interpersonal, cognitive, and behavioral needs (Wolff et al., 2012).

Four studies (20%) focused on specific aspects of trauma and the connection between

trauma and specific life areas such as relationships, coping skills, reactionary behavior, and spirituality (Messina, Calhoun, & Warda, 2012; Messina et al., 2010; Saxena et al., 2014; Swopes, Davis, & Scholl, 2017). An additional two articles (10%) identified treatment components focused on how traumatic histories effect self, relationships, and community with a focus on anger regulation within various settings (Kubiak et al., 2012; Kubiak et al., 2015). Six studies (30%) provide details about psychoeducational type interventions focused on developing various coping skills (Ball et al., 2013; Kubiak et al., 2016; Roe-Sepowitz et al., 2014; Ward & Roe-Sepowitz, 2009; Wolff et al., 2015; Zlotnick, Jonson, & Najavits, 2009). Lastly, two studies (10%) provided scarce details that provided only vague, unclear descriptions of the trauma-informed practices within the intervention (Styron et al., 2006; Valentine & Smith, 2001).

Key Outcomes Related to Trauma and Recidivism

Trauma. Fewer than half of the studies reported outcomes related to trauma (k=9, 45%). However, all studies but one (k=19; Zlotnick, Johnson, & Najavits, 2009) reported positive reductions in related to trauma and trauma symptomology. Treatment groups reported significantly fewer trauma symptoms post-intervention (Ball et al., 2013; Kubiak et al., 2015; Messina, Calhoun, & Warda, 2012; Roe-Sepowitz et al., 2014; Swopes, Davis, & Scholl, 2017; Ward & Roe-Sepowitz, 2009). One study (5%) reported higher functioning on the global severity of illness index (Wolff et al., 2012). One study (5%) sample reported less sexual violence post-treatment than the control group (Sacks et al., 2008). Two additional studies (10%) reported improvements in potential correlates of trauma symptomology such as decreased depression and anxiety and higher self-efficacy (Kubiak et al., 2012; Valentine & Smith, 2001).

Recidivism. Markers of recidivism varied across the studies, as did the time point in which recidivism was measured. Ten studies (50%) included a measure of recidivism, whereas

the other ten (50%) did not include an outcome related to justice involvement. Most of the studies used rearrest, reconviction, or return to prison/incarceration, either solely or combined, as markers of recidivism (k=8, 80%; Brown et al., 2015; Cimino et al., 2015; Kubiak, 2004; Kubiak et al., 2016; Messina, Calhoun, & Warda, 2012; Messina et al., 2010; Sacks, McKendrick, & Hamilton, 2012; Sacks et al., 2008). However, one study (10%) used jail time (Styron et al., 2006) as their marker of recidivism and the last study (10%) used the legal composite score of the Addiction Severity Index to indicate recidivism among their sample (Zlotnick, Johnson, & Najavits, 2009). The follow-up period of the studies ranged from three months (Zlotnick, Johnson, & Najavits, 2009) to five years (Brown et al., 2015). Many studies reported rates of recidivism at either six months post-intervention (k=2, 20%; Sacks et al., 2008; Zlotnick, Johnson, & Najavits, 2009), one year post-intervention (k=3, 30%; Kubiak et al., 2016; Messina et al., 2010; Sacks, McKendrick, & Hamilton, 2012), or two years after intervention completion (k=2, 20%; Cimino et al., 2015; Messina, Calhoun, & Warda, 2012). Results were mixed on the effect of treatment on recidivism among the samples.

Intervention programs that were associated with a lower level of recidivism included: Beyond Violence (Kubiak et al., 2016), Helping Women Recover and Beyond Trauma (Messina, Calhoun, & Warda, 2012; Messina et al., 2010), and Challenge to Change (Sacks, McKendrick, & Hamilton, 2012; Sacks et al., 2008). The interventions that showed no statistically significant difference for recidivism included: Helping Women Recover (Cimino et al., 2015), the Young Adults Services Program (Styron et al., 2006), and Seeking Safety (Zlotnick, Johnson, & Najavits, 2009). Overall, the treatment group experienced lower recidivism rates than the control or treatment as usual groups, though this trend was often not statistically significant.

Assessing Risk for Bias

Overall, the identified studies presented high risk of bias across the five measured areas (see Table 1.3). Only one study (5%) had low risk of bias in three of the five areas (Kubiak et al., 2016). The remaining nineteen studies (95%) had two or fewer areas in which risk of bias was low. Two articles (10%) scored as high risk of bias across all five areas assessed (Brown et al., 2015; Wolff et al., 2012). The highest level of risk of bias appeared for performance bias and detection bias; categories in which 19-20 articles were identified as high-risk of bias. The lowest areas for risk of bias were: attrition, in which nine studies (45%) scored as low risk of bias, and reporting, in which seven studies (35%) were assessed to pose a low risk of bias.

Discussion

Little literature exists to provide evidence for trauma-informed interventions among justice populations, particularly for justice-involved early adults. This review aimed to identify what trauma-informed programs are being used with criminal justice populations. Additionally, the review synthesizes the literature around trauma assessment tools and rates of trauma presence among justice-involved populations across intervention studies. This review identifies the scarce number of empirical studies examining the effects of trauma-informed interventions with justice populations. Furthermore, among the few studies exploring trauma and criminal justice involvement, the reviewed articles have relatively small samples, reducing the ability to draw conclusions about the effectiveness of the treatment program studied. Though the connection to the justice system provided variation among the sample, half the included studies did not provide analysis of a criminal justice outcome, thus reducing the evidence for how trauma-informed treatment can affect criminal behaviors.

Early Adulthood, Trauma, and Criminal Justice Involvement

Only one of the articles included a sample with a mean age that is considered part of the early adult time frame (i.e., 18-29 years). This is especially concerning as more discussion is emerging on the unique needs of this subpopulation of justice-involved persons (Frank, 2017). This one study found no effect for the trauma-informed program among a small sample of participants. The program used with this sample was minimally described, leaving little room for replicability of findings in different samples. Considering the onset of PTSD symptoms, as well as other mental health symptoms, during this crucial developmental period (Arnett, 2007), more research is needed on how trauma-informed practices at this point in someone's life can impact their trajectory.

Trauma Measurement

Measurement of traumatic experiences or trauma symptoms was inconsistent among the studies. Fifteen different measurement tools were incorporated into the studies reviewed. Multiple studies used more than one measure; however, nine studies (45%) used only one measure or did not report the measure they used to assess trauma among their samples. Lack of consistency (in measurement tool, in measurement time frame, and in construct measured) inhibits the ability to provide general prevalence estimates of the number of justice-involved individuals who have experienced traumatic events and symptoms.

Moreover, measurement tools were oftentimes not developed as research tools in which comparisons were meant be drawn about the prevalence of trauma. These measures were developed to assist clinicians in assessing the severity of symptoms related to PTSD in clinical settings when developing treatment plans (SAMHSA, 2014). The inconsistency in tools intensifies the inability to accurately determine a clear trauma prevalence estimate for justice-

involved populations. Additionally, the inconsistent time frames in which trauma is measured precludes researchers from understanding the impact of traumatic experiences outside the criminal justice system versus those experienced once justice system contact is made.

Practice, Research, and Policy Implications

More concerning is the inconsistent treatment programs used among these studies. Although six trauma-informed practices are evidence-based practices that have been used with criminal justice, very few of these were used in the studies included in this review: Seeking safety, Eye Movement Desensitization and Reprocessing, and Trauma Recovery and Empowerment Model (Adams et al., 2017). Indeed, only one study included a combination of these treatments while evaluating an outcome related to criminal justice, thus providing little support for the evidence for the effectiveness of these treatment programs with justice populations. Considering the high rates of traumatic experiences and symptoms of this population, programming should be offered that allows justice-involved populations to receive treatment for experiences of trauma.

Furthermore, the majority of studies focused on justice-involved women. Male participants were largely absent from the reviewed studies. Understanding the role trauma plays for justice-involved males is vital in understanding the need for trauma-informed treatment for all justice populations. In line with the RNR framework, female offenders might have unique treatment needs in comparison to males, but the responsivity principle would suggest that treatments should be available that consider these gender differences and appropriate treatment programs should be developed for all justice-populations (Bonta & Andrews, 2007; Vitopoulos, Peterson-Badali, & Skilling, 2012).

As the social work profession continues to promote effective ways to reduce criminal

justice involvement (Pettus-Davis & Epperson, 2015), research and policy related to effective programs for justice-involved populations will need to account for nuances of antecedents to criminal behavior, both structurally and individually, such as trauma. More evidence is needed to provide an understanding of both the prevalence and impact of traumatic experiences and symptoms among justice-involved populations. Much is to be learned about this phenomenon.

Limitations

Findings should be applied with caution. First, the included studies are only those published in peer-reviewed journals. Publication bias is strong and it is likely that other research exists examining this phenomenon. However, inclusion of unpublished work is outside of the scope of this review due to the intent to identify peer-reviewed research related to trauma-informed interventions. Secondly, the findings in this review are used in effort to synthesize the knowledge about trauma-informed programs in criminal justice settings. This review is not meant to comment on the efficacy of evidence-based practices through evaluation of effect sizes for the outcomes reported. Additionally, the estimates of trauma presence cannot be generalized beyond the populations included. The studies were not population-based studies and as such, no prevalence estimates can be identified to make claims about the prevalence of trauma among justice-involved populations. Lastly, several studies include similar authors, or subsets of the same authors. It is possible that the samples used within the studies overlap in a way that is not readily apparent within the scope of this review. As such, findings could be conflated in a way not discussed.

<div align="center">

Conclusions

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Although a seemingly substantial portion of individuals within the criminal justice system experience trauma, few studies examine how incorporating trauma-informed practices into

rehabilitation efforts can favorably reduce criminal justice outcomes. Oftentimes criminal justice

practices minimally screen for, or attempt to address, the presence of the traumatic experience of

offenders. Undiagnosed and untreated trauma can contribute to the risky behaviors (e.g.,

impulsivity, poor reasoning) justice populations engage in that perpetuates justice involvement.

More research is needed to understand how trauma affects criminal justice involvement,

especially for subpopulations such as early adults or male offenders.

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Table 1.1 *Excluded articles*

Citation	Reason for exclusion
Adams Peden et al 2011	Baseline data only
Agger 1994	Not empirical research
Ahrens Rexford 2002	Juvenile focus; No criminal justice related outcome
Barrett Indig et al 2015	Feasibility study; no inferential statistics
Bennett Stoops et al 2007	Not trauma-inclusive intervention
Campbell Albert et al 2016	Case study
Chamberlain Moore 2002	Adolescents; Not trauma-inclusive intervention
Coulter 2011	Not criminal justice population; No criminal justice related outcome
Daniel 1996	Case study; No criminal justice related outcome
Davis Sheidow McCart 2015	Not trauma-inclusive intervention
DeHart 2010	Evaluation of group; No individual measures
Ferszt Miller et al 2015	Not trauma-inclusive intervention; No trauma measures
Field Gaetano et al 2010	Not criminal justice population
Gobin Reddy et al 2015	No criminal justice related outcome; Baseline data only
Goldstein Warner-Robbins et al 2009	Not trauma-inclusive intervention
Jackson Mrug et al 2011	No intervention
Kitchiner 2000	Case study; No criminal justice related outcome
Kubiak Fedock et al 2014	fidelity of intervention, No criminal justice related outcome
Libeman Burnette et al 2014	No criminal justice related outcome; Baseline data only
Mahoney Chouliara et al 2015	Qualitative; no group comparison
McMackin Keisen et al 2002	Juvenile focus; overview of group process; case study
Merriam 1998	Case studies; No criminal justice related outcome
Messina Grella 2006	No criminal justice related outcome; Not trauma-inclusive intervention
Mahoney Chouliara et al 2015	No criminal justice related outcome; Qualitative data
Parker 2003	Not empirical research on intervention
Roe-Sepowitz Bedard Pate 2007	No outcome variables
Roe-Sepowitz Pate 2009	Group process discussion; No outcomes measured
Sacks Chaple et al 2012	Not trauma-inclusive intervention
Simpson Kaysen et al 2007	No criminal justice related outcome; Not trauma-inclusive intervention
Valentine 2000	No criminal justice related outcome; Treatment protocol
Wolff Frueh et al 2011	No discussion of an intervention
Woodson Hives Sanders 2010	Program model; not empirical study
Wolff Vazquez et al. 2010	Baseline data, No criminal justice related outcome
Zun Downey Rosen 2006	Not criminal justice population

Table 1.2. *Systematic review results*

Citation	Sample Size; mean age (standard deviation) Justice Affiliation Research Design	Trauma Intervention	Measure of Trauma	Prevalence of Trauma	Recidivism Outcome
Ball, S., Karatzias, T., Mahoney, A., Ferguson, S., & Pate, K. (2013).	N=24; 37.6(10.5) Community-based female offenders One group pre- post-test	Survive and Thrive	• PCL-C	DNR	None
Brown, S. H., Gilman, S. G., Goodman, E. G., Adler-Tapia, R., & Freng, S. (2015).	N=22; 32 Drug court Quasi-experimental	Seeking Safety and EMDR individually	• CAPS • DAPS	68%	(Post program reconviction; 5 years) 19% of treatment group & 10% of TAU group recidivated
Cimino, A. N., Mendoza, N., Thielman, K., Shively, R., & Kunz, K. (2015).	N=57; 36.5(8.6) Community re-entry after prison One group pre- post-test	Helping Women Recover	• TSI	100%	(Reported rearrest or incarceration; 2.5-4.5 years) 6% of sample recidivated
Kubiak, S. P. (2004).	N=196; 36.1(8.1) State prisoners One group pre- post-test	Residential substance abuse treatment	• National Comorbidity Survey subscale	55% lifetime PTSD	(New arrest, parole revocation, or legal problems; DNR timing) DNR
Kubiak, S., Fedock, G., Kim, W. J., & Bybee, D. (2016).	N=35; 33.7(8.9) Prison inmates RCT	Beyond Violence	• DNR	DNR	(Return to prison for parole violation, new arrest or jail time; 12 months) 11% treatment & 38% TAU had new arrest 16% treatment & 20% TAU had jail stay
Kubiak, S., Kim, W. J., Fedock, G., & Bybee, D. (2012).	N=35; 39(8.4) Prison inmates Quasi-experimental	Beyond Violence	• Screening Scale for DSM-IV PTSD-modified	DNR	None
Kubiak, S. P., Kim, W. J., Fedock, G., Bybee, D. (2015).	N=19; 34.2(9.1) Prison inmates RCT	Beyond Violence	• Screening Scale for DSM-IV PTSD-modified	DNR	None
Messina, N., Calhoun, S., & Warda, U. (2012).	N=150; 36(8.9) Drug court RCT	Helping Women Recover and Beyond Trauma	• PDS	31% met PTSD criteria	(Sanctions, criminal arrest; 2 years) Treatment participants less likely to be remanded to jail
Messina, N., Grella, C. E., Cartier, J., & Torres, S. (2010).	N=115; 36(9.6) Prison inmates RCT	Helping Women Recover and Beyond Trauma	• PDS	26%	(Return to prison; 12 months) Treatment group less likely to return to prison
Roe-Sepowitz, D. E., Bedard, L. E., Pate, K. N., & Hedberg, E. C. (2014).	N=320; 33.8(9.8) Female prison inmates One group pre- post-test	Esuba	• PYS • TSI	72% experienced childhood abuse 34% experienced rape as an adult	None
Sacks, J. Y., McKendrick, K., & Hamilton, Z. (2012).	N=427; 35.1(7.9) Prison and re-entry RCT	Challenge to Change	• PSS-I • BSI • THQ	97%	(Incarceration, self-report criminal activity, arrest; 6 and 12 months)

					Experimental: [1]Time to incarceration ~20 days longer, [2]self-report criminal activity reduced by 62% at 6- & 57% at 12- months, & [3]at 6 months, 80% reduction in arrest; Control: [1]self report criminal activity 45% at 6- & 45% at 12- months, [2]59% rearrest rate at 6 months
Sacks, J. Y., Sacks, S., McKendrick, K., Banks, S., Schoeneberger, M., … Shoemaker, J. (2008).	N=314; 35.6(7.5) Prison and re-entry RCT	Challenge to Change	• Diagnostic Interview Schedule for PTSD • PSS • THQ	43% met PTSD criteria 98% expose to some form of trauma	(Arrest, arrest for other than parole violation, any criminal acts, drug-related crime, sex crime; 6 months) Treatment had significantly greater reduction for arrests in crimes other than parole
Saxena, P., Messina, N. P., & Grella, C. E. (2014).	N=115; 35.9(9.6) Female prison inmates RCT	Helping Women Recover and Beyond Trauma	• PDS	35%	None
Styron, T. H., O'Connell, M., Smalley, W., Rau, D., Shahar, G., Sells, D., … Davidson, L. (2006).	N=60; 20.4(3.4) Previously incarcerated; involved in YAS program One group pre- post-test	Young Adult Services (YAS) programming	• CTQ	'moderate to severe' range of abuse or neglect	(Jail time; DNR) No effect with trauma-informed intervention
Swopes, R. M., Davis, J. L., & Scholl, J. A. (2017).	N=56; 35.5(8.6) Prison inmates Quasi-experimental	Helping Women Recover and Beyond Trauma	• TAA • PCL-C • PTCI • TSI	48% PTSD 96% traumatic event	None
Valentine, P. V., & Smith, T. E. (2001).	N=123; 33.8(9.5) Federal Correctional Institute RCT	Traumatic Incident Reduction (TIR)	• PSS	DNR	None
Ward, A., & Roe-Sepowitz, D. (2009).	N=29; 30.9(7.9) Residential facility and Moderate security female prison inmates Quasi-experimental	Esuba	• TSI	78% experienced childhood abuse	None
Wolff, N., Frueh, B. C., Shi, J., & Schumann, B. E. (2012).	N=74; 36(10) Prison inmates Quasi-experimental	Seeking Safety	• CAPS • THQ • LSC-R	88% met PTSD criteria	None
Wolff, N., Huening, J., Shi, J., Freuh, B. C., Hoover, D. R., & McHugo, G. (2015).	N=230; 42.5(12.5) Prison inmates RCT	Seeking Safety and Trauma Recover and Empowerment Model	• PCL-C • CAPS • GSI • BSI	75% experienced childhood trauma	None
Zlotnick, C., Johnson, J., & Najavits, L. M. (2009).	N=49; 34.6(7.4) Prison inmates RCT	Seeking Safety	• CAPS • TSC-40 • THQ	83.5% met PTSD criteria	(Legal composite score of Addiction Severity Index, return to prison; 3 and 6 months) Non-significant trend for treatment group less likely to have returned to prison by 6 months

Table 1.3. *Risk of bias assessment*

	Selection	Performance	Detection	Attrition	Reporting
Ball, Karatzias, Mahoney, Ferguson, & Pate, (2013)	H	H	H	H	U
Brown, Gilman, Goodman, Adler-Tapia, & Freng (2015)	H	H	H	H	H
Cimino, Mendoza, Thielman, Shively, & Kunz (2015)	H	H	H	L	L
Kubiak (2004)	H	H	H	U	L
Kubiak, Fedock, Kim, & Bybee (2016)	L	H	H	L	L
Kubiak, Kim, Fedock, & Bybee (2012)	H	H	H	L	U
Kubiak, Kim, Fedock, Bybee (2015)	L	H	H	L	U
Messina, Calhoun, & Warda (2012)	L	H	H	H	L
Messina, Grella, Cartier, & Torres (2010)	L	H	H	L	H
Roe-Sepowitz, Bedard, Pate, & Hedberg (2014)	H	H	H	H	U
Sacks, McKendrick, & Hamilton (2012)	U	H	H	L	U
Sacks, Sacks, McKendrick, Banks, Schoeneberger, … Shoemaker (2008)	L	H	H	L	U
Saxena, Messina, & Grella (2014)	U	H	H	H	L
Styron, O'Connell, Smalley, Rau, Shahar, Sells, … Davidson (2006)	H	H	H	L	L
Swopes, Davis, & Scholl (2017)	H	L	H	H	H
Valentine, & Smith (2001)	U	H	H	U	U
Ward, & Roe-Sepowitz (2009)	H	H	H	L	U
Wolff, Frueh, Shi, & Schumann (2012)	H	H	H	H	H
Wolff, Huening, Shi, Freuh, Hoover, & McHugo (2015)	U	H	H	U	U
Zlotnick, Johnson, & Najavits, (2009)	L	H	H	H	L

"H" high risk of bias, "L" low risk of bias, "U" unclear level of bias
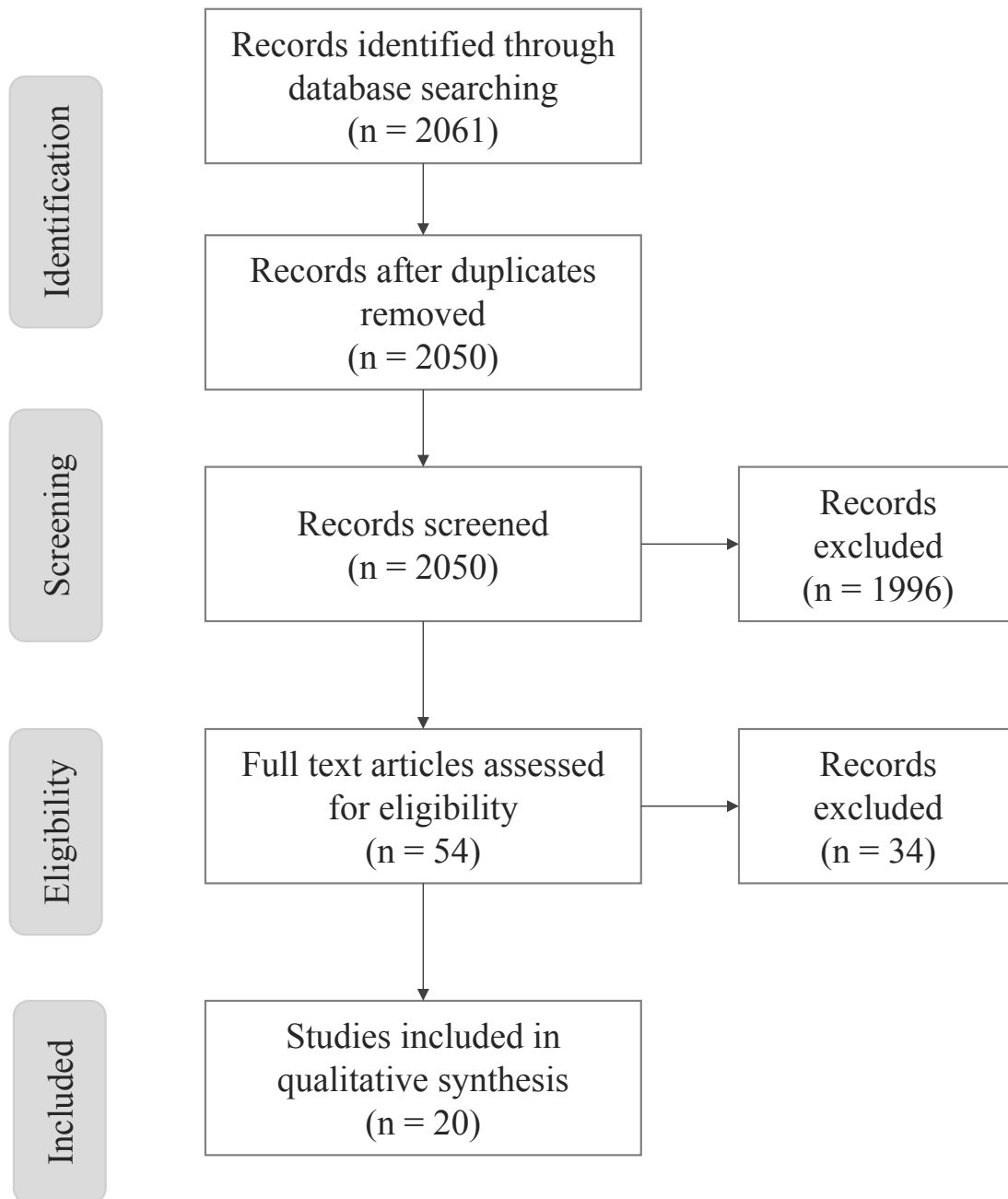
Figure 1.1. Screening flowchart of included and excluded studies
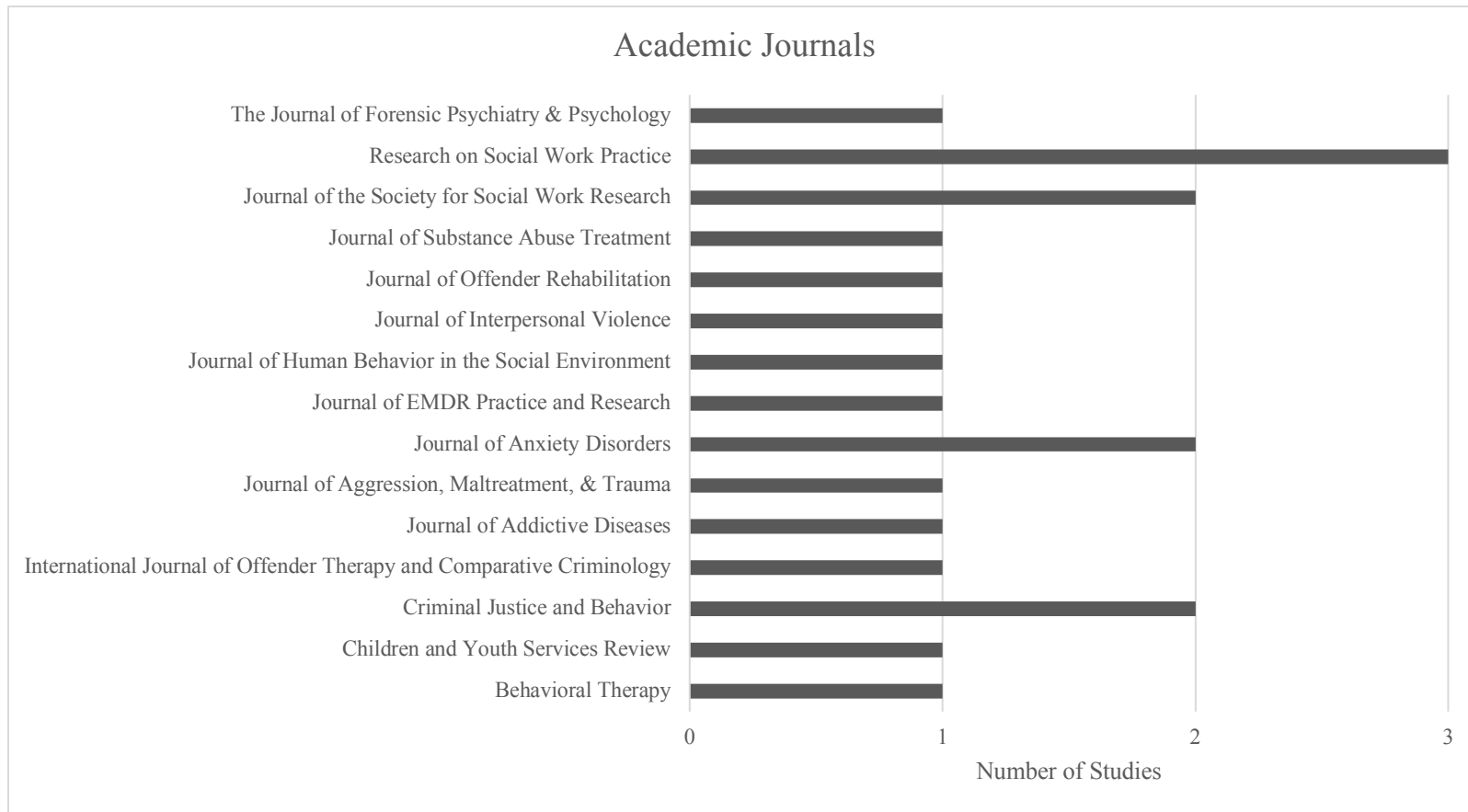
Figure 1.2. Academic journals in which included studies were published
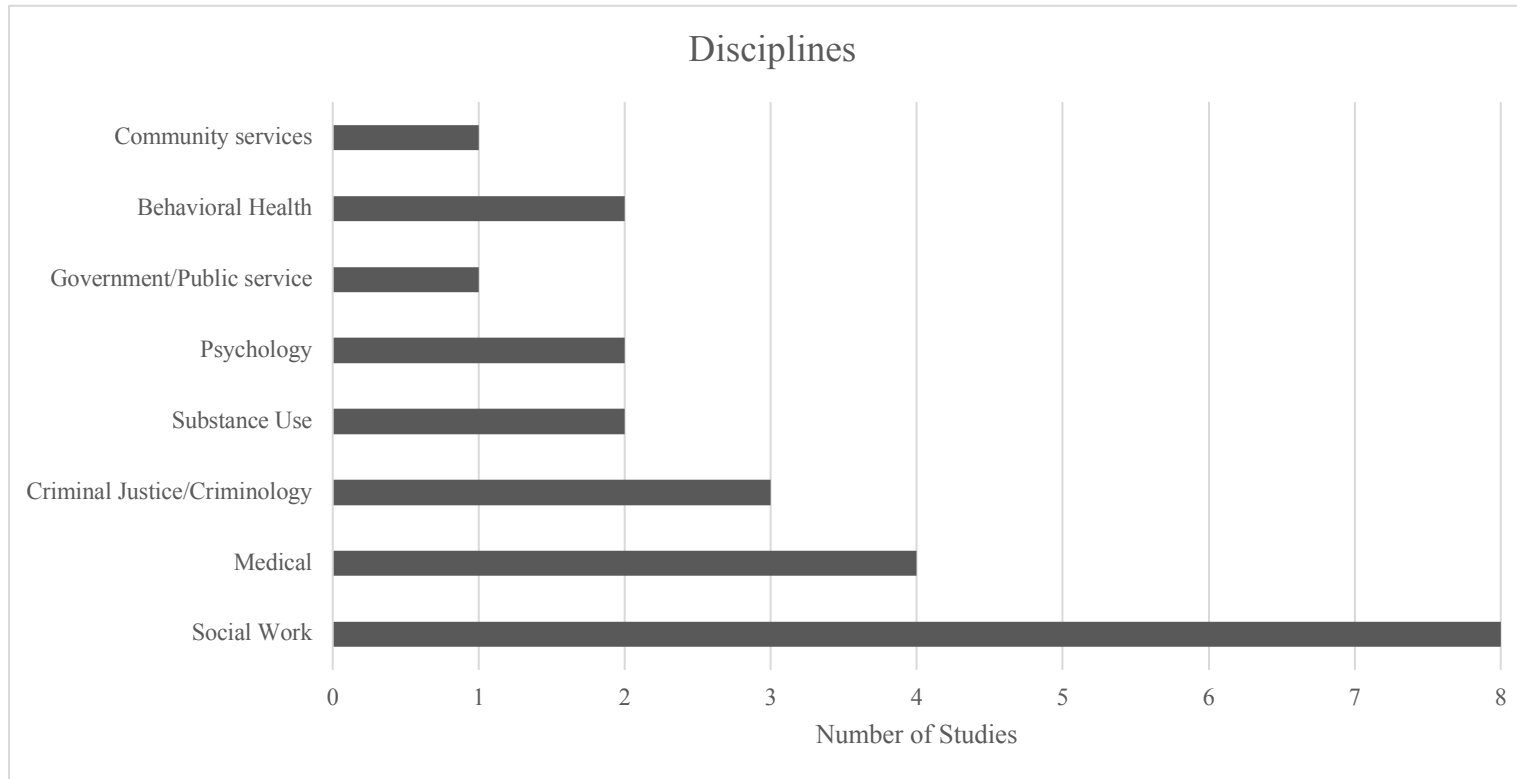
Figure 1.3. Disciplines represented within the included studies.
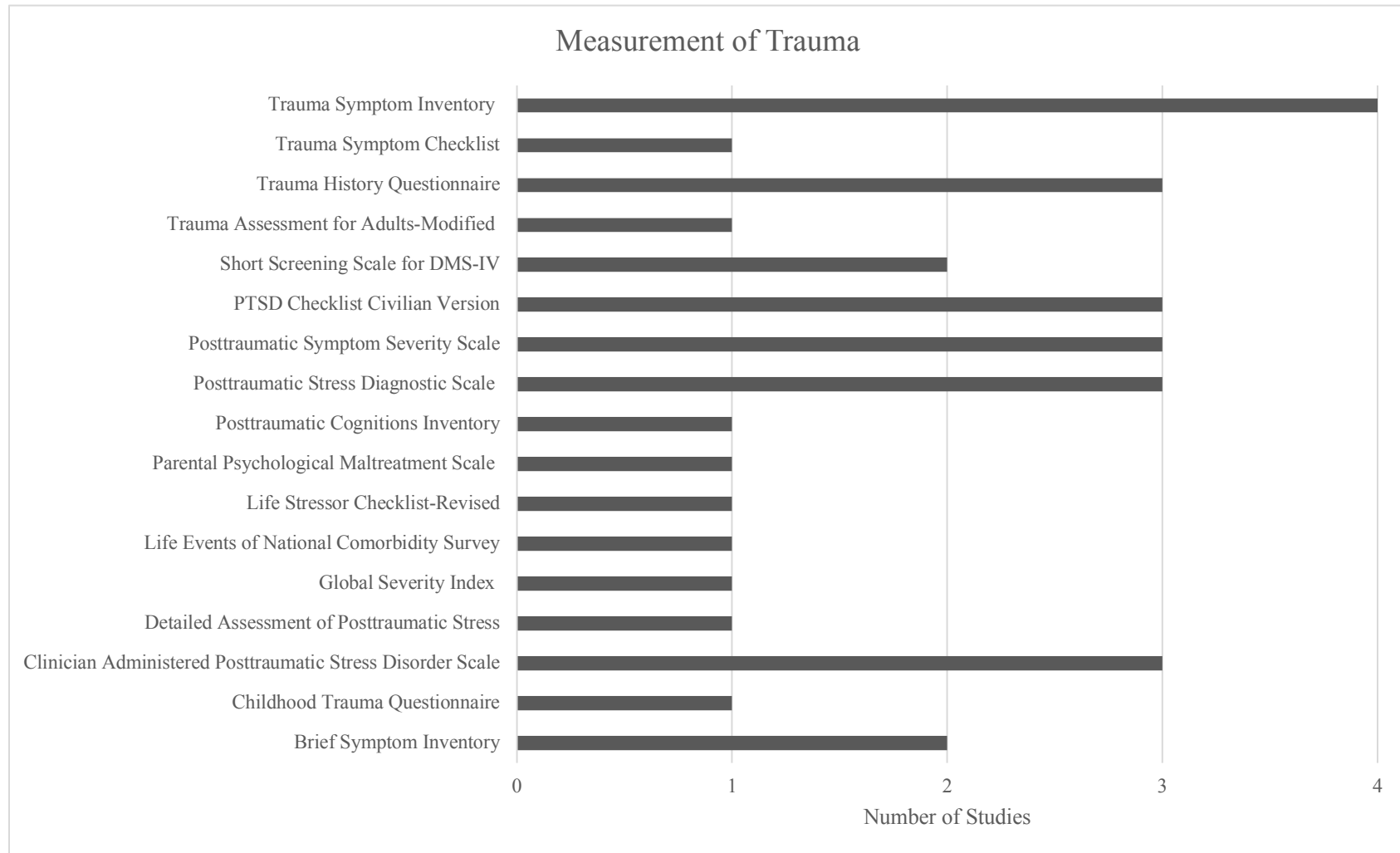
Figure 1.4. Assessment tools used to measure trauma.

PAPER 2

CRIMINOGENIC RISK AND NEED AMONG EARLY ADULT PROBATIONERS

Abstract

Approximately 1 in 53, or 4.6 million, U.S. adults are under correctional community supervision (i.e., probation, parole, or post-release supervision) at any given time. Estimates suggest that 1.8 million of these individuals (27%) experience mental illnesses. Criminogenic risk and needs for probationers are one way to attempt to target services to achieve successful probation supervision. This observational, cohort study uses administrative data from 57,747 probationers in one southeastern state to identify the relationships among age group, gender, mental health symptomatology, and criminogenic risk and need, and probation violations. Findings suggest that early adult (18-29 year olds) probationers experience higher levels of criminogenic risk and need than older adult probationers. Additionally, probationers who self-report mental health symptomology experience higher levels of need related to antisocial personality traits, antisocial values, self-control issues, dysfunctional family history, and substance use. Moreover, female probationers experience higher levels of need than males in certain areas. Findings suggest assessment of risk and need is vital to identifying appropriate supervision and rehabilitation plans for probationers.

Introduction

The high prevalence of individuals involved in the criminal justice system is one of the most salient public health issues currently facing the United States. The United States has the highest rate of incarcerated individuals of any country in the world with 459 out of every 100,000 persons being incarcerated at some point in their lifetime (Bureau of Justice Statistics, 2018). Roughly 4.6 million (or 1 in 53) additional adults are on probation or parole (Kaeble & Bonczar, 2016). Community supervision (i.e., probation, parole, or post-release supervision) is used as a means to provide alternatives to prison sentences or as a means of maintaining safety in communities whenever individuals are released from prison (North Carolina Department of Public Safety, n.d.). The number of adults serving probation sentences decreased slightly, by 78,700, in 2015; however, the number of probation exits also decreased from 2.1 million to 2.0 million indicating probationers were not successfully completing probation at a similarly high rate (Kaeble & Bonczar, 2016). Furthermore, the configuration of individuals on probation remained stable. In 2015, females made up 25% of probationers and non-Hispanic whites made up 55% of probationers, and 30% of probationers were non-Hispanic black adults (Kaeble & Bonczar, 2016).

The high number of adults involved in the criminal justice system has negative impacts on individuals, families, and communities. Justice involvement is associated with low educational attainment, unstable or under- employment, welfare dependency, disrupted relationships, substance use (Chung, Kittle, Steinberg, Altschuler, 2005; Windle & Wiesner, 2004), and higher likelihood of lifelong offending (Barr et al., 2012; Ryan, Williams, & Courtney, 2013). When first contact with the criminal justice system occurs early in life, the opportunity to experience these adverse outcomes is greater due to the longer amount of time

available to experience such events.

Early Adults

  The unique needs of early adults (i.e., 18-29 year olds), such as impulsivity and lower executive functioning, are a significant challenge faced by the adult criminal justice system. Early adults account for over 40% of all individuals arrested (The Federal Bureau of Investigation [FBI], 2016) and adults under 30 are the most likely age group to recidivate (Durose, Cooper, & Snyder, 2014). Additionally, 18-30 year olds accounted for 29-58% of each type of crime reported in 2015 by the FBI Uniform Crime Report; including 55% of murder arrests, 52% of robbery arrests, and 42% of arrests made for property crimes (FBI, 2016). No national information exists that specifically identifies the number of early adults who are on probation or parole; however, it is likely that a similar proportion of adults on probation are early adults. Moreover, a large portion of adolescent offenders will naturally discontinue offending around age 19-20; however, many others continue offending into adulthood and some individuals will begin their criminal behavior during early adulthood (Loeber, Farrington, & Petechuk, 2013). Disrupting criminal behavior in the early stages is critical, because as adolescents transition to early adulthood, those who continue criminal behavior are likely to increase the violence and severity of their crimes (Loeber & Farrington, 1998).

  Early adults provide distinctive challenges to the criminal justice system due to their similarities with juveniles when considering some adult behaviors, but similarity to older adults when considering certain adolescent behaviors. Early adults are more impulsive, are less able to engage in emotional regulation, have lower cognitive development, and engage in more risk-taking behavior than older adults; however, on average these same characteristics are more advanced for early adults when compared to adolescents (The Council of State Governments

Justice Center, 2015). Considering this middle range of less maturity and reasoning than older adults, but more maturity and reasoning than adolescents, supervision considerations are necessary for this developmental stage.

Early adulthood is a time period marked by uncertainty, instability, and frequent changes for many 18-29 year olds (Arnett, 2007). During early adulthood individuals are likely to move residences multiple times, enter and exit many relationships, and experience less social support than any other developmental stage (Arnett, 2007; Arnett, Zukauskiene, & Sugimura, 2014). In addition, early adults are more impulsive, risk taking, exhibit more emotional dysregulation, and are less future-oriented thinking than older adults, but are more cognitively developed and autonomous than adolescents (Modecki, 2009; Monahan, Steinberg, Cauffman, & Mulvey, 2013; The Council of State Governments Justice Center, 2015). Justice involvement precludes early adults from beginning the process of obtaining and maintaining consistent employment, housing, and relationships on pace with their non-justice involved peers during a crucial developmental period. As such, intervening at this stage is critical to assisting early adults in establishing prosocial behavioral patterns needed to promote desistence from criminal activity.

Mental Illnesses

Although a significant proportion of the individuals involved with the criminal justice system experience mental health needs, estimates of the extent of mental illnesses within justice populations vary widely depending on diagnoses and measurement of the phenomenon. Excluding antisocial personality disorder diagnoses, best estimates are that approximately 119,000 jail inmates (15% of men and 31% of females; Steadman, Osher, Robbins, Case, & Samuels, 2009), around 250,000 individuals in prison (16% of males and 24% of females; Ditton, 1999), and about 1.82 million probationers (27%; Crilly et al., 2009) experience mental

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illnesses. Teplin (1990) contrasts current severe disorders (i.e., major depression, mania, or schizophrenia) of jail populations and the general population, finding that the rate for jail inmates is 6.36% whereas the non-jailed population estimate is 1.84%. The contrast becomes even more apparent when considering age. For 18-22 year olds the rates are 4.36% compared to 1.94%, for 23-27 year olds the rates are 6.99% versus 1.65%, and lastly, for 28-32 year olds the rates are 10.8% for jail inmates compared to 2.36% for non-jailed individuals (Teplin, 1990). In the general population, early adults experience higher rates of psychiatric disorders than any other age group, but they disengage from treatment at the highest rates (Arnett, Zukauskiene, & Sugimura, 2014). Mental illnesses combined with the challenges brought about by early adults being less cognitively developed than older adults (e.g., impulsivity, poor reasoning) makes early adults particularly challenging for the criminal justice system.

Criminogenic Risks

The Risk-Need-Responsivity (RNR) model has been widely used to identify risk of reoffending based on eight criminogenic risk areas (the Risk Principle), malleable behaviors within the criminogenic risk areas to target for treatment (the Need Principle), and likelihood of responding to a treatment based on risks and needs (the Responsivity Principle) among justice-involved individuals across the world (Bonta & Andrews, 2007). The RNR model identifies eight criminogenic risk areas: (1) attitudes favorable of criminal behavior, (2) antisocial personality traits, (3) peers engaged in procriminal behavior or thinking, (4) criminal past, (5) low educational attainment or limited employment, (6) unstable family or marital relationships, (7) substance use, and (8) lack of prosocial leisure activities (Andrews & Bonta, 2010). These eight areas, when present, substantially increase the likelihood of criminal behavior occurring (Andrews, Bonta, & Wormith, 2006).

Extensive meta-analyses and reviews have demonstrated the association between these eight criminogenic risk factors and recidivism (Andrews, Bonta, & Wormith, 2006; Andrews et al., 1990); however, most samples in these meta-analyses have been entirely or predominantly male (Andrews & Dowden, 2006) and, with one or two exceptions, there has been little effort to understand the criminogenic risks among younger vs. older justice-involved adults (Andrews, Kiessling, Robinson, & Mickus, 1986; Rettinger & Andrews, 2010). For example, researchers using a sample of 411 justice-involved women found that the highest recidivism rate was for individuals under thirty years old and the same age range was identified as the highest risk for recidivism by standardized measures of criminogenic risk (i.e., LS/CMI; Rettinger & Andrews, 2010). Moreover, there are no studies that focus on the examination of criminogenic risks among early adult offenders with mental health needs. Thus, more information about how criminogenic risks differ among younger vs. older offenders, and how those differences might vary by gender and mental health status is needed to advance the field and inform the development of evidence-based practices to meet the unique challenges of managing and supervising this high-risk population of young offenders.

Current Study

The current study aims to provide foundational knowledge about criminogenic risk and need levels for early adults. Considering the lack of knowledge surrounding early adults within the criminal justice system, administrative data are used to answer the following research questions: (1) Do levels of criminogenic need vary for early adults compared to older adults? (2) Among early adults, do criminogenic need levels vary by gender and presence of mental health symptomology? (3) Does age group predict likelihood of probation violation? (4) Does age group predict the likelihood of probation violation (i.e., presence of violation and number of

probation violations)? and (5) Does risk level predict presence of and number of probation violations?

Methods

Design and data

A retrospective observational design was used to examine the criminogenic risks and needs of adults sentenced to probation in the state of North Carolina in 2010. Statewide administrative data from North Carolina Department of Public Safety (NC DPS) were used to examine criminogenic risks and needs as measured by North Carolina's Risk and Need Assessment (RNA; North Carolina Division of Community Corrections, 2011), which classifies offenders' risk for recidivism into three categories: high, moderate, or low.

The administrative data source contained data on participants' socio-demographic backgrounds, a measure of criminogenic risk level and criminogenic needs, and probation event details. Socio-demographic variables included gender, date of birth, race, and possession of a high school diploma. Gender is coded as male (2) or female (1). Race is identified by DPS as "white" (1), "African American" (2), "Native American" (3), "Hispanic" (4), "Asian American" (5), or "other" (6). Individuals are identified as one race and there is no overlap between racial categories. Possession of a high school diploma is coded as either no (1) or yes (2).

Measures

The Risk Needs Assessment (RNA), is a tool used to assess multiple areas for each probationer across the state. The RNA was developed by the NC DPS to assess offenders' risk and needs in the areas of substance use, history of dysfunctional family, level of self-control, and antisocial personality traits and values, among other areas. In addition to the RNA, four questions capture information on the mental health symptoms of probationers. The RNA has

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been validated using administrative data on multiple samples of offenders between 2005-2010 (Cuddeback & Lambert, 2012). Additionally, although this measure of risk and need was adapted by DPS, items included in the RNA mirror the indicators identified in the criminogenic risk and need literature (Bonta & Andrews, 2007).

Risk for reoffending. The RNA overall risk for reoffending score is assigned to probationers on a 5-point scale, with 1 representing highest risk and 5 representing minimal risk. DPS uses an algorithm that incorporates multiple factors (e.g., age of first offense, criminal associates, etc.) to assign the overall risk for reoffending score (North Carolina Division of Community Corrections, 2011). For the purpose of analyses risk is dichotomized as high or moderate risk (1-3) versus low risk (4-5).

Need areas. Five criminogenic need areas are assessed within the DPS protocol through the use of the RNA: substance use, antisocial values, antisocial personality traits, dysfunctional family history, and self-control issues. Each of the five need scales are measured by combining individual questions to create an index of level of need within each of the risk areas. Indexes all demonstrated acceptable reliability considering the large sample size of the study (See Table 2.1). Table 2.2 provides correlation values among the scales. All scale scores were statistically significantly related to each other at the $p<.001$ level.

Antisocial values. The *antisocial values* scale is a 5-item scale with scores ranging from 0-26 with questions such as "I think the world owes me a better life," "Breaking the law is not a big deal as long as you don't hurt someone," and "I get in trouble because I have bad luck." The scale demonstrated adequate reliability with the sample (α=.66). In a validation study, the scale produced evidence of convergent, concurrent, and predictive validity for samples with similar characteristics as this sample (Cuddeback & Lambert, 2012). Procriminal attitudes is one of the

central eight risk factors in the RNR model. The DPS measure includes items that focus on constructs such as negative attitudes toward law enforcement agencies and rationalizations for criminal behavior (Bonta & Andrews, 2007).

Antisocial personality traits. Next, *antisocial personality traits* is a 10-item scale comprised of items such as "Before the age of 15, I got in trouble for: running away, lying, stealing, starting fires, etc." where respondents either endorse the item (1) or do not endorse the item (0) providing a range from 0-10 for the scale. Scores ranged from 0-9 among the sample. The markers for antisocial personality traits assessed by the RNA tool explore central constructs (i.e., aggression, parental monitoring as a youth, pleasure seeking, etc.) included in the central criminogenic risk factors (Bonta & Andrews, 2007). The antisocial personality values scale scores demonstrated acceptable reliability for the present sample (α=.70) and has shown prior evidence of convergent, concurrent, and predictive validity with previous samples (Cuddeback & Lambert, 2012).

Self-control issues. *Self-control issues* is a 6-item index with scores ranging from 0-24 and includes questions such as "People would describe me as impulsive" and "I blurt out whatever is on my mind." The markers for self-control issues included in the RNA tool explore central constructs (i.e., impulsivity, adventure seeking, and aggression) included in the criminogenic risk factor of antisocial personality pattern (Bonta & Andrews, 2007). The self-control issues need scale demonstrated acceptable reliability for the sample (α=.69) and previously had convergent, concurrent, and predictive validity with similar samples (Cuddeback & Lambert, 2012).

Substance use. Next, the *substance use* scale includes 7 items such as "When I drink alcohol or use drugs I get in arguments with others" and "I feel 'hung over' or sick when I wake

up." The substance use scale scores ranged from 0-26 and the scale includes items that assess the frequency and severity of use, paralleling the markers included in the RNR model (Bonta & Andrews, 2007). This scale had a Cronbach's alpha score acceptable for the sample (α=.69) and has shown convergent, concurrent, and predictive validity in previous studies (Cuddeback & Lambert, 2012).

Dysfunctional family history. Lastly, *dysfunctional family history* included 6 items with questions such as "We didn't hold to any rules or standards growing up" and "Family members were in trouble with the law." The dysfunctional family history scale scores ranged from 0-24 and the scale includes questions related to low parental monitoring, poor family relationships, and lack of discipline, similar to the constructs identified by the RNR model (Bonta & Andrews, 2007). For this sample, the reliability score was in an acceptable range (α=.66). The scale also showed convergent and concurrent validity in a prior validation study (Cuddeback & Lambert, 2012).

Mental illnesses. In addition to the criminogenic risk scales, DPS measures mental health symptomology. Probationers are asked to report on four questions related to symptoms associated with severe mental illnesses (i.e., experience of delusions, hallucinations, suicidality, or mania). This index was used to create a single variable to identify probationers who endorsed having an experience of at least one mental health symptom (i.e., *any mental health*) versus those that did not report experience any mental health symptoms (i.e., *no mental health*). Thus, everyone was assigned a score of "1" (at least one mental health symptom) or "0" (no mental health symptoms).

Violations. The violations file contained information on each violation experienced during the specified time frame. A violation occurs whenever a person on probation fails to meet

a requirement of probation (e.g., missed appointments, positive drug screen, non-payment of fees, etc.) or whenever new charges are accrued while an individual is on probation. A probation violation does not automatically result in a new sentence; therefore, individuals may have many instances of probation violations during their sentences. Additionally, multiple violations could be applied at one point in time if multiple rules have been broken, thus resulting in more than one violation being recorded as occurring at the same time. Based on this information about the presence of violations per each probationer, two variables were created. First, a variable was created to identify if a probationer was ever violated between her or his supervision begin date and either the supervision end date or, if she or he had not completed supervision, the time at which data were collected in 2014. This variable is dichotomous to determine any violation (coded as "1") versus no probation violation (coded as "0"). Next, a variable was created that identified the number of violations an individual experienced between her or his supervision begin and end dates.

Sample

   Sample identification. The administrative data set consisted of all probation events during a 4-year time period (2010-2014) with a separate data file including all probation violations during the same time frame. In order to match probation events with probation violations, unique probationers were identified based on year in which they began probation. In order to allow for a standard time to assess probation violation, the year 2010 is the index year for analyses, meaning everyone who was sentenced to a probation sentence in 2010 is included in the sample, however just one per person. The entire probation file contained 279,000 probation events, 60,947 of which occurred during 2010. Further reductions (i.e., eliminating

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anyone outside of the 18-64 age range, deleting the second probation, or more, probation event for the same person) resulted in the final sample size (N=57,747).

Sample characteristics. The sample consists of 57,747 individuals who met the following study criteria: 1) received at least one sentence to probation in North Carolina during calendar year 2010; and 2) were between 18-64 years of age. Early adults were defined as individuals aged 18-29 (n=25,309) and older adults as individuals aged 30-64 (n=32,438). Among early adults on probation, the average age was 23.2 (SD=3.1) and 46.0% (n=11,648) were white, 47.0% (n=11,895) were black and 2.3% (n=590) were Hispanic. The early adult sample was predominately male (n=19,056; 75.3%) and 42.5% (n=10,754) had obtained a high school diploma or GED.

Among the older probationers aged 30–64, the average age was 41.1 (SD=8.5) and 49.5% (n=16,060) were white, 44.2% (n=14,364) were black and 2.5% (n=808) were Hispanic. The older adult probationers were predominately male (n=24,084; 74.3%) and 49.2% (n=15,960) had obtained a high school diploma or GED. See Table 2.3 for more sample characteristics.

Analyses

All analyses were conducted using Stata 14. Bivariate analyses were used to describe the sample and look for differences between the early adult and older adult samples. Then, among the early adults in the sample, bivariate analyses explored demographic differences between male and female probationers, as well as between probationers with any mental health symptomology versus those with no mental health symptomology. Next, t-test analyses were used to identify the differences in scale scores for the two age groups; followed by bivariate analyses to compare high risk males versus females and probationers with mental illness symptoms versus those with no mental illness symptoms for the early adults in the sample.

Multivariate regression analyses (i.e., OLS, negative binomial regression, and Poisson Inverse Gaussian regression) were used to identify prediction of scale scores by age group, gender, and mental health status when controlling for race and educational status.

Violations. Regression analyses were used to explore the effects of demographic variables, age group, mental health symptomology, and needs scale scores on presence of a probation violation (i.e., logistic regression) and number of violations given (i.e., zero-inflated negative binomial regression). Regression analyses included available demographic variables as covariates, along with needs scales when appropriate, and variables were entered in a stepwise order. The first model included only demographic variables. Next, needs scales were added to the model. Models three through five included new interaction terms based on age group and the most salient needs scales: antisocial values (model three), antisocial personality traits (model four), and self-control issues (model five). These analyses were conducted first for the entire sample, then the early adult sample was tested with interaction terms for gender and the needs scales followed by mental health status and the needs scales.

The second set of regression analyses used number of violations as the dependent variable. Though the dependent variable is a count variable, consideration is necessary regarding the dispersion of the values as well as the proportion of zeros present in the dependent variable. A negative binomial regression is appropriate due to the difference between the mean and dispersion being significantly different than zero (UCLA: Statistical Consulting Group, n.d.).

The zero-inflated model accounts for two pathways to zeros occurring in the dependent variable. This model assumes that one group of zeros had the potential for violations, but did not receive any, and that a second group of individuals never had the potential for receiving violations (certain zeros). First, a model predicts the number of violations using covariates of

gender, race, high school diploma status, criminogenic risk category, mental health status, age group, and the needs scales. Then, the model is compared to a model to test if individuals in the certain zeros group are predictable by a second set of covariates. Considering the nature preliminary analyses of the relationship between race and violations, a binary variable of African American vs. any other racial group is included in the inflator portion of the regression model. The other covariates in the inflated model include gender, possession of a high school diploma or GED, risk category, mental health status, age group, and the needs scales. This process was repeated for just the early adult sample to identify patterns for the younger age group.

Results

Findings from analyses are presented below and in Tables 2.3 through 2.22. Results of analyses conducted with the entire sample will be presented first. Next, analyses conducted with just the early adult sample are presented. These analyses include tests for differences by gender and mental health status. All discussion of results will be presented in the same order: demographic differences and similarities, need scales analyses, regression analyses for presence of a violation, and conclude with analyses for number of violations.

Whole sample

Demographic differences. Table 2.3 details all demographic differences for early adult probationers compared to older adult probationers. A slightly higher proportion of early adults (75.3%) were males compared to older adult probationers (74.3%, $x^2(1)=8.24$, $p<.01$). A higher percentage of early adults (47.0%) were African American than older adults (44.28%, $x^2(5)=92.23$, $p<.001$). Older adults (49.2%) were more likely to have a high school diploma or GED than early adult probationers (42.5%, $x^2(1)=257.54$, $p<.001$). More early adults (34.4%) experienced at least one mental health symptom compared to older adults (30.42%,

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$x^2(1)=105.12$, $p<.001$). Early adult (65.7%) probationers were significantly more likely to be identified as high risk of offending than older adult probationers (41.1%, $x^2(1)=3400$, $p<.001$). A substantial portion of early adult probationers were identified as having a high overall risk of reoffending (n=16,621, 65.7%). Whereas, just 41% of older adults were identified as high-risk probationers (n=13,335). Early adults (69.0%) were significantly more likely to have received a probation violation than older adults (61.4%, $x^2(1)=356.72$, $p<.001$). Almost 70% of early adults (n=17,454) received a probation violation during their sentence, whereas just over 60% of older adults (n=19,915) received a violation.

Needs scales. Table 2.4 illustrates the different means, standard deviations, and range of scores for the needs scales for the whole sample, as well as the early adult subsamples. Figures 2.1-2.6 illustrate the distribution of the needs scales' scores for: the entire sample (2.1), the early adult sample (2.2), the early adult female sample (2.3), the early adult male sample (2.4), the early adult sample experiencing mental health symptoms (2.5), and the early adult sample not reporting mental health symptoms (2.6). Further, Figure 2.7 illustrates the distribution of scores and outliers for each of the needs scales. As is evident by these figures, the distributions approximate normal for self-control issues and dysfunctional family history, but not for antisocial values, antisocial personality traits, or substance use.

Bi-variate analyses. Independent groups t-tests were conducted to examine the relationship between early adults and older adults across all needs scales (see Table 2.5 for raw scores and Table 2.6 for standardized scores). Raw scores are the true values reported based on the scale anchors at the time of completion. Standardized scores are created by setting the mean score to zero and standard deviation to 1. Standardizing scores allows for comparison across needs scales of different ranges by creating a standard range of scores. A statistically significant

difference was observed between early adults and older adult probationers across all needs

scales. Early adult probationers reported higher averages than older adults on: antisocial values

(2.84 vs. 2.21, t(57745)=-26.92), d=.23, p<.001), antisocial personality traits (1.65 vs. 1.22,

t(57745)=-30.02, d=.25, p<.001), self-control issues (11.22 vs. 10.85, t(57745)=-15.26, d=.13,

p<.001), and dysfunctional family history (9.81 vs. 9.34, t(57745)=-19.77, d=.17, p<.001).

Substance use was the only scale in which older adults scored higher (3.12 vs. 2.91,

t(57745)=7.43, d=.06, p<.001). This trend held even when the sample was separated into high-

risk and low-risk probationers. For the low-risk sample, effect sizes ranged from d=.10 for self-

control issues to d=.14 for antisocial values, substance use, and dysfunctional family history. For

the high-risk sample, effect sizes were between d=.07 for self-control issues and d=.17 for

substance use.

Multivariate analyses. Ordinary Least Squares (OLS) regression was appropriate for

self-control issues and dysfunctional family history as evidenced by the distributions of these

variables. Count regressions were used for two of the other scales: antisocial values and

antisocial personality traits. The substance use scale models violated assumptions for all

regressions and therefore was not examined through a multivariate model.

Self-control issues. The self-control issues scale was normally distributed among the

sample and all observations were independent of each other. The regression model was tested for

multicollinearity and heteroscedasticity. The Variance Inflation Factor (VIF) test values were

lower than ten, therefore multicollinearity was not an issue in the model. Heteroscedasticity was

an issue with multiple variables based on the Breusch-Pagan test statistic. However, after

observing plots of the residuals (see Figure 2.8), there was no apparent clustering around the

fitted values, therefore robust standard errors are sufficient to correct for the heteroscedasticity

and were used for the model.

Table 2.7 provides coefficient values, robust standard errors, and confidence intervals for each variable in the model. After controlling for gender, race, diploma status, and mental health symptomology, early adults experienced statistically significantly higher scores on the self-control issues scale than older adults (b=.19, p<.01). Additionally, individuals who were identified as high risk for reoffending had higher scores on the scale than low-risk individuals (b=.45, p<.001). None of the interaction terms were statistically significant for the self-control issues model (see Figure 2.9). The overall model was statistically significant and accounted for 9% of the variance among the self-control issues scores.

Dysfunctional family history. As Figure 2.1 illustrates, the scores for the dysfunctional family history needs scale were normally distributed. The Breusch-Pagan test illustrated some heteroscedasticity among the variables. Examination of the residuals demonstrated no clear pattern of clustering around fitted values, therefore use of robust standard errors was determined to be a sufficient correction for the heteroscedasticity (see Figure 2.10). The VIF test determined no variables introduced multicollinearity into the model. Table 2.8 provides regression output values for the dysfunctional family history scale model. After controlling for gender, race, diploma status, and mental health symptomology, early adults reported statistically significantly higher scores on the scale than older adults (b=.19, p<.011). Early adults reported a .19 higher score on average than older adults for the dysfunctional family history scale. Additionally, probationers identified as high risk reported a .45 higher average score than low-risk probationers (b=.45, p<.001). The interaction between age group and gender was statistically significantly related to the dysfunctional family history scale scores (b=-.24, p<.001). As Figure 2.11 shows, the dysfunctional family history scores for early adult males were substantially

higher than for older adult males. The overall regression model was statistically significant and accounted for 4% of the variance among the scale scores ($p<.001$, Pseudo $r^2=.04$).

Antisocial values. The antisocial values scale's distribution (see Figure 2.1) violated the assumptions for OLS which led to the use of count regressions. Poisson regression was attempted first, but the scale's distribution violated the dispersion assumption (i.e., the difference between the mean and the variance was statistically significantly different from zero), negative binomial regression was assessed next and was found to be appropriate and not misspecified for the data as confirmed by the linktest function in Stata. The model was conducted using incidence rate ratios as well as an exposure variable that identified the number of days between probation supervision begin and exit dates.

Results of the negative binomial regression are presented in Table 2.9. After controlling for gender, race, education, and mental health status, the early adults are expected to have a rate of antisocial values scores 1.26 times higher compared to older adult probationers (irr=1.26, $p<.001$). Two interaction terms in the model were not statistically significant: age group*gender and age group*gender*mental health symptom. The interaction between age group and mental health symptomology was statistically significant (irr=.87, $p<.05$). Figure 2.12 illustrates the relationship between age group and mental health symptomology on expected rate on the antisocial values scale. Early adults had significantly higher logs of expected rates of antisocial values than older adults, and early adults with mental health symptoms had the highest rates., indicating a higher expected rate of antisocial values for early adults with mental health symptoms than for any other group.

Antisocial personality traits. The antisocial personality traits scale similarly violated distribution assumptions of OLS regression (see Figure 2.1). Goodness of fit tests revealed that

Poisson regression assumptions were also not met for this scale. A series of negative binomial regressions and Poisson Inverse Gaussian regressions were tested to determine which was not misspecified and provided the strongest Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values. Due to the high initial peak of the values and far right skew (see Figure 2.1), the Poisson Inverse Gaussian regression provided the correctly specified and best fitting model (see Table 2.10).

After controlling for gender, race, education, and mental health symptomology, early adult probationers are expected to have a rate of antisocial personality traits 1.34 times higher than older adult probationers (irr=1.34, p<.001). Probationers identified as high risk of reoffending are expected to have a rate of antisocial personality traits 1.57 times higher than probationers identified as low risk (irr=1.75, p<.001). Two interactions are statistically significant in this model: the interaction between age group and gender (irr=.89, p<.01) and the interaction between age group and mental health status (irr=.90, p<.05). As illustrated in Figure 2.13, early adult males have the highest scores for antisocial personality traits, but early adult females also have higher scores than either older adult males or females. Similarly, early adults with mental health symptoms reported the highest scale scores, but older adults with mental health symptoms reported higher scores than either age group without mental health symptomology.

Substance use. The substance use scale did not conform to any of the tests appropriate for linear or count regression models. The models constructed for this scale all violated assumptions of OLS, Poisson, Negative Binomial, and Poisson Inverse Gaussian regression modeling. This scale was excluded from multivariate analyses for this reason.

Probation violation receipt. Logistic regression was used to examine differences in the

probability of receiving a probation violation for the full sample. Although all five models (i.e.,

model with just demographics, model adding the needs scales, and three models including

interaction terms) were statistically significant (see Table 2.11), only models three, four, and five

with the interaction terms will be discussed. Model three included a term for the interaction

between age group and antisocial values. In this model, the interaction term was not statistically

significant. However, individuals identified as high-risk had 131% higher odds of receiving a

violation (OR=2.31, p<.001), similarly early adults had 7% higher odds of receiving a violation

(OR=1.07, p<.01). Other variables in the model that were statistically significantly related to

receiving a probation violation included: gender (OR=.86, p<.001), race (OR=1.03, p=.002),

high school diploma possession (OR=.83, p<.001), score on antisocial personality traits

(OR=1.09, p<.001), score on the dysfunctional family history scale (OR=1.01; p<.001), and

score on the substance use scale (OR=1.02, p<.001).

Model four included a term for the interaction of age group and antisocial personality

traits. This model was statistically significant (p<.001, Pseudo r^2=.05) and the interaction term in

this model was also statistically significant (OR=1.07, p<.001). Figure 2.14 illustrates the

relationship between age group, antisocial personality traits, and probability of probation

violation. With this term included in the model, the main effect of age group is no longer

statistically significant (p=.51). Females, again, experienced higher odds of receiving a violation

(OR=.87, p<.001), as did probationers with no high school diploma (OR=.83, p<.001). Race

remained statistically significant in the model (OR=1.03, p=.002). As scores on the antisocial

values scale increased by one unit, the probability of receiving a probation violation increased by

2% (OR=1.02, p<.001), similar patterns emerged for antisocial personality traits (9% increase;

OR=1.09, $p<.001$), dysfunctional family history (1% increase; OR=1.01, $p<.001$), and substance use (2% increase; OR=1.02, $p<.001$).

Lastly, model five added an interaction term for age group and the self-control issues need scale. Again, this model was statistically significant (Pseudo $r^2=.05$, $p<.001$). Like in model four, the interaction term in model five was statistically significantly related to probation violation (OR=1.02, $p<.001$; see Table 2.11). Figure 2.15 illustrates the relationship among age group, self-control issues, and probability of a probation violation. Unlike the previous model, the main effect for age group (OR=1.08, $p<.011$) was statistically significant in this model. Risk level remained the highest predictor of probation violation (OR=2.31, $p<.001$). Aside from mental health symptomology and the self-control issues scale, all variables included in the model were statistically significantly related to the probability of receiving a probation violation.

Number of violations. Table 2.12 provides the mean, standard deviation, and range for the scale scores for the total sample, as well as the subsamples: early adults, older adults, early adult females and males, and early adults with and without mental health symptomology. The sample contained 18,474 individuals who received zero violations during their probation sentences. Figures 2.16-2.17 illustrate the distribution of the number of violations for the sample. Considering the high number of zeros, a zero-inflated model was constructed to determine if inflator variables predicted certainty of having no violations. The Vuong test for zero-inflation has recently been shown to not be the best prediction of model comparison between zero-inflated models and regular negative binomial models (Wilson, 2015), however testing alternatives are not available, thus, though the Vuong test was statistically significant (indicating zero-inflation is present), it is used with caution. However, the presence of strong, statistically significant predictors in the inflated model provides an argument for use of the zero-inflated regression

model.

Table 2.13 provides full results of the zero-inflated negative binomial regression model. In the first model, predicting count of violations, all covariates except the antisocial values subscale were statistically significant at the $p<.05$ level, however, only relationships statistically significant at the $p<.001$ level will be discussed. Although all racial groups were included in the model, only being African American was associated with increased number of violations ($b=-0.10$, $p<.001$). Individuals who did not have a high school diploma or equivalency had 1.06 more violations on average ($b=-0.06$, $p<.001$). Being in the high-risk group for reoffending was associated with 1.35 more violations than individuals in the low risk group ($b=0.30$, $p<.001$). Early adults had 1.22 more violations on average than older adults ($b=0.20$, $p<.001$). Lastly, a one unit increase on the substance use scale was associated with a 1.02 increase in number of violations ($b=0.02$, $p<.001$).

All the variables except mental health symptomology were statistically significant at the $p<.001$ level in the inflated model. Males had 1.22 higher odds of being in the certain zero violations group ($b=0.20$, $p<.001$), however males also had higher violations count in the first model ($b=0.03$, $p<.05$); the significant proportion of males in the sample may contribute to this finding. Probationers with a high school diploma had 1.40 higher odds of being in the certain zero violations group ($b=0.34$, $p<.001$), similarly individuals in the low risk group were at 2.29 higher odds of being in the certain zero group ($b=-0.83$, $p<.001$). For each of the subscales, a one unit increase on the scale was associated with higher odds of being certain zeros. Being a certain zero means that certain factors increase the likelihood that someone never had the potential to receive a violation. As the antisocial personality traits score decreased by one unit, odds of certain zero violations increased by 1.09 ($b=-0.09$, $p<.001$); antisocial values score decreases

were associated with 1.02 increased odds of being in the certain zero violations group (b=-.02, p<.001), and substance use was associated with 1.04 increased odds of certain zero group inclusion (b=-0.04, p<.001). Lastly, being a race other than African American was associated with increased odds of 2.51 of being in the certain zero group for probation violation (b=-0.92, p<.001).

Early adults

      Gender differences. In the early adult sample, males and females differed significantly on multiple demographic characteristics (see Table 2.14). Significantly more early adult probationer males were African American (47.74%) than were female (44.75%) probationers (x^2=149.29, p<.001). Substantially more female early adults (48.44%) had received a high school diploma or GED than male early adult probationers (40.54%, x^2(1)=120.32, p<.001). A slight difference in proportion of female (33.30%) and male (34.33%) probationers who experienced mental health symptoms was present in the early adult sample (x^2(1)=4.80, p=.05). Male early adult probationers (73.98%) were significantly more likely to be identified as high risk of reoffending than females (40.35%, x^2(1)=2400, p<.001). In addition, significantly more male early adults (70.30%) received a probation violation than female probationers (64.90%, x^2(1)=64.17, p<.001).

      Needs scales. Bivariate analyses confirmed gendered differences on the average score for the needs scales for the early adult sample (see Table 2.15 for raw score comparisons and Table 2.16 for standardized score comparisons). Early adult males, in general, experienced higher scores than females on antisocial values (2.99 vs. 2.37, t(25307)=-14.37, d=.21, p<.001), antisocial personality traits (1.75 vs. 1.33, t(25307)=-15.77, d=.23, p<.001), and substance use (3.07 vs. 2.42, t(25307)=-13.60, d=.20, p<.001). This trend held for low-risk probationers;

however, for high risk probationers, there was no statistically significant difference for males and females on substance use needs.

Female early adult probationers experienced higher needs than male probationers in the areas of self-control issues (11.30 vs. 11.20, t(25307)=2.42, d=.04, p<.05) and dysfunctional family history (10.08 vs. 9.71, t(25307)=9.04, d=.13, p<.001). Differences on self-control issues held for the low-risk group (female=11.02, male=10.76, t(8686)=4.89, d=.10, p<.001) and the high-risk group (female=11.70, male=11.345, t(16619)=5.48, d=.12, p<.001). Significant differences were observed on the dysfunctional family history scale for the low-risk subsample (female=9.77, male=9.28, t(8686)=8.69, d=.19, p<.001), as well as the high-risk subsample (female=10.56, male=9.87, t(16619)=10.94, d=.24, p<.001).

Mental health symptom differences. Early adult probationers who self-reported experiences of any mental health symptoms were significantly different than early adults who did not self-report any mental health symptoms (see Table 2.17). A slightly higher proportion the probationers who self-reported mental health symptoms were male (76.11%) than those who did not self-report mental health symptoms (74.86%, x^2(1)=4.80, p<.05). A higher proportion of probationers who reported mental health symptoms were African American (51.74%) compared to probationers who did not report mental health symptoms (44.51%, x^2(5)=122.52, p<.001). A higher portion of the probationers who did not report mental health symptoms had obtained a high school diploma or GED (43.58%) compared to probationers who reported mental health symptoms (40.42%, x^2(1)=23.33, p<.001). Early adult probationers reporting mental health symptoms were more likely to be identified as high risk of offending than probationers not reporting mental health symptoms (70.23% vs. 63.28%, x^2(1)=3400, p<.001). A higher percentage of the early adults with mental health symptomology were violated than those

without mental health symptomology (71.26% vs. 67.76%, $x^2(1)=32.75$, $p<.001$).

Need scales. Statistically significant differences emerged across all needs scales for probationers with mental health symptoms compared to those with no mental health symptoms (see Table 2.18 for raw score differences and Table 2.19 for standardized score differences). Probationers reporting mental health symptoms reported higher needs across all scales compared to probationers not reporting mental health symptoms: antisocial values (4.27 vs. 2.08, $t(25307)=-59.53$, $d=.79$, $p<.00$), antisocial personality traits (2.05 vs. 1.44, $t(25307)=-25.97$, $d=.34$, $p<.001$), self-control issues (12.26 vs. 10.68, $t(25307)=-42.33$, $d=.56$, $p<.001$), substance use (3.64 vs. 2.53, $t(25307)=-25.98$, $d=.34$, $p<.001$), and dysfunctional family history (10.36 vs. 9.52, $t(25307)=-22.77$, $d=.30$, $p<.001$). These differences remained when subsetting the group into low-risk and high-risk of reoffending.

Violation presence. Logistic regressions were conducted to determine the likelihood of probation violation for the early adult sample. Models were constructed that included interaction terms for gender and needs scales (see Table 2.20). As with the whole sample, all step-wise models were statistically significant, however, only the models with the interaction terms will be discussed. First, a model included an interaction between gender and antisocial values. Though the model itself was statistically significant ($x^2=3947.42$, $p<.001$, Pseudo $r^2=.05$), the interaction term was not statistically significant ($p=.93$). Though the interaction was not statistically significant, the main effects for both gender (OR=.87, $p<.001$) and antisocial values (OR=1.02, $p<.01$) were statistically significant, indicating that females experienced higher odds of receiving a probation violation as did individuals with higher scores on the antisocial values scale.

For the fourth model, an interaction term between gender and the antisocial traits needs scale was introduced. Again, the model overall was statistically significant ($x^2=3947.42$, $p<.001$,

Pseudo r^2=.05) but not the interaction term (*p*=.63). Again, females experienced higher odds of probation violation than males (OR=.87, *p*<.001). Similar to model three, as antisocial traits increased, odds of receiving a probation violation increased (OR=1.08, *p*<.001).

Lastly, model five included an interaction between gender and the self-control issues scale. Like models three and four, this model was statistically significant (*x^2*=3949.48, *p*<.001, Pseudo r^2=.05), but not the interaction term (*p*=.15). The main effects for gender were not statistically significant in this model (*p*=.78). The effect of the self-control issues need scale was statistically significant (OR=1.01, *p*<.05), indicating that for each one unit increase on the self-control issues scale, probationers experienced 1% higher odds of receiving a probation violation.

A second set of models included interaction terms between mental health symptomology and needs scales (see Table 2.21). Again, interaction terms were introduced one at a time for the final three models in the series. Although each of the models were statistically significant at the *p*<.001 level, interactions were not statistically significant for any of the models: mental health symptomology and antisocial values (*p*=.18), mental health symptomology and antisocial personality traits (*p*=.65), and mental health symptomology and self-control issues (*p*=.45). The main effect for mental health symptomology was also not statistically significant across any of the three models: model 3 (*p*=.13), model 4 (*p*=34), model 5 (*p*=.61).

Number of violations. Following the trend for the whole sample, the distribution of early adult violations was zero-inflated and highly skewed (see Figure 2.18). In the early adult sample, 7,855 individuals had zero violations. Considering the high number of zeros, a count model that allowed for skewed data is appropriate. Negative binomial and zero-inflated negative binomial regression models were tested and the zero-inflated model provided a better fit than the regular

negative binomial regression. Results from the zero-inflated negative binomial regression model are provided in Table 2.22.

For the early adults in the sample, all variables included in the model except the antisocial values and dysfunctional family history needs scales were significant at the $p<.05$ level. The zero-inflated model provides a more accurate explanation of the relationship between the covariates and number of violations. In this model the antisocial values scale was the only variable that was not a statistically significant predictor of certain zeros. Males experienced 1.16 times higher odds of being certain zeros ($b=.15$, $p<.01$). Similarly, individuals with a high school diploma or equivalent experienced 1.77 higher odds of being in the certain zero violations group ($b=.57$, $p<.001$) and individuals with mental health symptoms experienced 1.11 higher odds ($b=.10$, $p<.05$). The probationers in the low risk group were 2.32 times more likely to be in the certain zero group for violations ($b=-.84$, $p<.001$). For the continuous variables in the model each unit increase in the variable was associated with a change in odds of being certain zeros: as age increased by one unit odds of certain zero status decreased by 1.02 odds ($b=-.02$, $p<.01$), as antisocial personality traits increased, odds of certain zero status decreased by 1.12 ($b=-.11$, $p<.001$), as self-control issues increased, likelihood of being in the certain zero violations group decreased by 1.03 ($b=-.03$, $p<.001$), as substance use values increased, status as a certain zero violation decreased by 1.05 odds ($b=-.05$, $p<.001$). Lastly, individuals who were in a racial group other than African American had 3.00 higher odds of being certain zeros in violations ($b=-1.10$, $p<.001$).

Discussion

Incarceration rates among the U.S. population continue to be staggering. The United States has the highest rate of incarceration among any nation (Walmsley, 2016). Early adults

make up a significant portion of the individuals involved in the criminal justice system; more than any other 10-year age span (FBI, 2016). Statewide administrative data on probationers in North Carolina were used to examine the relationships among age, gender, mental health symptoms, criminogenic risk and needs level and violations for probationers. Findings suggest there are differences between early adult and older adult probationers which may have implications for specialized interventions by age and gender. Understanding the relationships among age, gender, race, mental health needs, and criminogenic risk and need is vital to successful completion of probation for such a large portion of the criminal justice population. As findings indicate, subgroups of probationers experience unique needs in regards to criminal justice involvement. Therefore, it is imperative that policies and interventions are targeted appropriately. The discussion will address findings from the entire sample, followed by the implications of findings from just the early adult sample.

Individual-level considerations

Risk levels were higher for early adult probationers compared to older adults in the sample indicating a need for programming that minimizes the risk of reoffending among this population. Based on results, interventions should be focused on specific areas of need for males differently than for females. When focusing on the high-risk sample, within the context of the RNR model of focusing needs for highest risk offenders, older adult males need support in regards to antisocial personality traits. Female-focused older adult interventions should include the topics of substance use, family functioning, and self-control. Additionally, probationers with self-reported mental health symptomology experienced higher levels of criminogenic needs across all measured areas. Though probationers with reported mental health symptoms were no more likely to be violated than those who did not report symptoms, the higher level of needs

indicates a need for justice practices to incorporate criminogenic programming responsive to the mental health needs. By implementing policies and practices around additional support for early adults and probationers with mental health needs, the criminal justice system can better supervise these subsets of probationers with the goal of more successful probation completions. Early adults comprise a substantial portion of justice-involved persons, thereby providing an opportunity to impact a large segment of the justice population by focusing on how to best supervise this age group.

System-level considerations

The findings from the zero-inflated negative binomial regression provide important considerations in regards to treatment targets for individuals on probation. Although individual risk factors (i.e., criminogenic risk and need) are predictive of both receipt of any violation and the number of violations incurred, other factors provide stronger correlations. The findings also provide evidence that more consideration is needed for structural factors potentially influencing decisions about probation violations. Structural variables (e.g., poverty, socioeconomic status, employment opportunities) are an important consideration of criminal justice involvement. In regards to race, though being African American does not imply certain violation, there are contextual assumptions that should be considered in regards to social and criminal injustice. Race could be used as a proxy for predictors such as neighborhood context and socio-economic status. Unfortunately, this dataset does not include markers of such variables, so they cannot be included in models to determine how they would impact number of violations. Furthermore, educational attainment was also a significant predictor of violation status. Considering these variables together, the findings give credence to the need to explore how structural factors are influencing decisions around criminal justice practices, including probation violations. The

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factors associated with violations cannot be limited to just individual covariates.

Programming considerations

Early adults on probation had different needs than older adults and these needs were further explored by gender and mental health status among early adults. Interventions with early adult women should focus on family functioning and self-control, whereas, interventions with young men should focus on antisocial personality traits and values. By tailoring programming to the needs of subgroups of justice-involved populations, treatment has the potential to be more effective in targeting the true correlates of crime most salient for these subgroups.

Mental health symptomology continued to be associated with higher levels of need across all needs scales for the early adult sample. High levels of need among the probationers reporting mental health symptoms is indicative of a need for additional programming for this group. The interaction terms in the logistic regressions suggest that mental health is not moderating the relationship between criminogenic need and receiving a probation violation. Therefore, mental illnesses should not be viewed as contributing to criminal behavior, but as a layer of an individual that needs to be assessed and considered in supervision planning while providing services related to criminogenic risk areas.

It is especially important that programs with early adults are tailored to their specific needs. Early adults on probation are often early in their criminal offending, and as such, are a prime target for effective intervention to disrupt the trajectory of criminal engagement. By focusing programming on the unique needs of this age group, multiple age-specific considerations can be made to overcome challenges associated with development. Moreover, policies are needed within the criminal justice system to ensure that assessment of risk and need is conducted to understand how best to supervise justice-involved individuals. By assessing risk

and need, officers can better implement strategies to work with probationers to successfully complete supervision. Future research should incorporate additional variables into models to identify the role of structural variables versus the role of psychological variables in contributing to criminal actions.

Limitations

The findings should be considered within the frame of the following limitations. First, the data are from one southeast state, and though the data include all probationers in the state, the generalizability of the data is limited to the state. It is unclear how these findings could be applied to other states' measures of criminogenic risk and need. Furthermore, the measure of criminogenic risk was developed and adapted for specific needs of the state. Although validity and reliability testing of the measure has occurred (Cuddeback & Lambert, 2012), caution is warranted when comparing the risk and need measures to other standardized measures of criminogenic risk and need. The scales performed well in this sample and with these analyses, thus demonstrating stability among how the state is assessing risk for their probationers. Lastly, the measures included do not represent all areas of the RNR model of criminogenic risk (e.g., leisure activities antisocial associates, potential marital relationships; Bonta & Andrews, 2007). Additional factors could be influencing the findings outside the scope of data used by the DPS. Ideally, data would include measures of neighborhood structure and neighborhood context, employment, social support, recreational activities, etc. However, considering that this is the measure used by the department, it is important to evaluate how the measure functions with different subpopulations to ensure validity of risk prediction among various subpopulations of probationers.

Conclusion

Overall findings strengthen the need for consideration of criminogenic risk and need level for subsamples of justice-involved populations. Early adults and individuals reporting mental health symptomology experience high levels of need which should be considered in sentencing and supervision planning for these groups. Additionally, structural variables are needed within assessment tools to better understand a full picture of criminal actions and risk for reoffending. The inclusion of risk and need assessment of all justice-involved individuals is a promising step forward for criminal justice supervision, however, it is imperative that assessment is inclusive of all vital factors and not limited in scope.

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Table 2.1. *Reliability and validity of needs scales*

	Scale Information
Antisocial values	5-item scale; range 0-20; α=.66; evidence of convergent, concurrent, and predictive validity
Antisocial personality traits	10-item scale; range 0-9; α=.70; evidence of convergent, concurrent, and predictive validity
Self-control issues	6-item scale; range 0-24; α=.69; evidence of convergent, concurrent, and predictive validity
Substance use	7-item scale; range 0-26; α=.69; evidence of convergent, concurrent, and predictive validity
Dysfunctional family history	6-item scale; range 0-24; α=.66; evidence of convergent and concurrent validity

Table 2.2. *Need scales correlation matrix.*

	Antisocial personality traits	Antisocial values	Self-control issues	Dysfunctional family history
Antisocial values	.33 <.001			
Self-control issues	.28 <.001	.42 <.001		
Dysfunctional family history	.25 <.001	.22 <.001	.26 <.001	
Substance Use	.31 <.001	.33 <.001	.25 <.001	.17 <.001

Table 2.3. *Sample characteristics (N=57,747).*

Variables	Early adult (n=25,309) n (%)	Older adult (n=32,438) n (%)	Test statistic	p
Gender				
Female	6,253 (24.71)	8,354 (25.75)	$x^2(1)=8.25$	.004
Male	19,056 (75.29)	24,084 (74.25)		
Race				
White	11,648 (46.02)	16,060 (49.51)	$x^2(5)=92.23$	<.001
Black	11,895 (47.0)	14,364 (44.28)		
Hispanic	590 (2.33)	808 (2.49)		
Asian American	102 (.40)	87 (.27)		
Native American	992 (3.92)	1,038 (3.20)		
Other	82 (.32)	81 (.25)		
High School Diploma				
Yes	10,754 (42.49)	15,960 (49.2)	$x^2(1)=257.54$	<.001
No	14,555 (57.51)	16,478 (50.8)		
Mental health symptom	8,716 (34.44)	9,868 (30.42)	$x^2(1)=105.12$	<.001
RNA risk level				
1 Extreme	7,066 (27.92)	4,218 (13.0)	$x^2(4)=5400.00$	<.001
2 High	9,555 (37.75)	9,117 (28.11)		
3 Moderate	7,505 (29.65)	11,531 (35.55)		
4 Low	1,181 (4.67)	7,566 (23.32)		
5 Minimal	2 (.01)	6 (.02)		
High Risk	16,621 (65.67)	13,335 (41.11)	$x^2(1)=3400.00$	<.001
RNA need level				
1 Extreme	6,890 (27.22)	5,267 (16.24)	$x^2(4)=1300.00$	<.001
2 High	4,866 (19.23)	6,083 (18.75)		
3 Moderate	8,615 (34.04)	11,908 (36.71)		
4 Low	4,241 (16.76)	7,654 (23.60)		
5 Minimal	967 (2.75)	1,526 (4.70)		
Has a violation				
Yes	17,454 (68.96)	19,915 (61.39)	$x^2(1)=356.72$	<.001
No	7,855 (31.04)	12,523 (38.61)		
Number of violations (M(SD))	5.04 (7.18)	3.53 (5.09)	$t(57745)=-29.47$; d=.25	<.001

Table 2.4. *Needs scales averages, standard deviations, and range by subsamples.*

	Total Sample (n=57,747)			Early adult only (n=25,309)			
	Total Sample (n=57,747) M(SD) Range	Early Adult (n=25,309) M(SD) Range	Older Adult (n=32,438) M(SD) Range	Male (n=19,056) M(SD) Range	Female (n=6,253) M(SD) Range	No MH (n=16,593) M(SD) Range	Any MH (n=8,716) M(SD) Range
Antisocial values	2.48 (2.80) 0-20	2.84 (3.00) 0-20	2.21 (2.64) 0-20	2.99 (3.03) 0-20	2.37 (2.71) 0-20	2.08 (2.45) 0-20	4.27 (3.31) 0-20
Antisocial personality traits	1.41 (1.72) 0-9	1.65 (1.82) 0-9	1.22 (1.61) 0-9	1.75 (1.87) 0-9	1.33 (1.65) 0-9	1.44 (1.66) 0-9	2.05 (2.04) 0-9
Self-control issues	11.01 (2.91) 0-24	11.22 (2.92) 0-24	10.85 (2.89) 0-24	11.20 (2.91) 0-24	11.30 (2.94) 0-24	10.68 (2.78) 0-24	12.26 (2.90) 0-24
Substance use	3.03 (3.37) 0-26	2.91 (3.27) 0-25	3.12 (3.44) 0-26	3.07 (3.28) 0-25	2.42 (3.20) 0-23	2.53 (3.03) 0-24	3.64 (3.57) 0-25
Dysfunctional family history	9.54 (2.85) 0-24	9.81 (2.84) 0-24	9.34 (2.84) 0-24	9.72 (2.78) 0-24	10.09 (3.00) 0-24	9.52 (2.69) 0-24	10.36 (3.04) 0-24

Table 2.5. *Need scale raw score comparisons for entire sample.*

	Total Sample (n=57,747)			Minimal/Low Risk (n=27,791)			Moderate/High Risk (n=29,956)		
	Early Adult (n=25,309) M(SD)	Older Adult (n=32,438) M(SD)	d	Early Adult (n=8,688) M(SD)	Older Adult (n=19,103) M(SD)	d	Early Adult (n=16,621) M(SD)	Older Adult (n=13, 335) M(SD)	d
Antisocial values	2.84 (2.97)	2.21 (2.64)	.23***	2.16 (2.53)	1.84 (2.32)	.14***	3.19 (3.11)	2.74 (2.95)	.15***
Antisocial personality traits	1.65 (1.82)	1.22 (1.61)	.25***	1.08 (1.46)	0.89 (1.33)	.13***	1.95 (1.92)	1.68 (1.85)	.14***
Self-control issues	11.22 (2.92)	10.85 (2.89)	.13***	10.87 (2.75)	10.69 (2.76)	.10***	11.40 (2.99)	11.20 (3.02)	.07***
Substance use	2.91 (3.27)	3.12 (3.44)	.06***	2.17 (2.63)	2.56 (2.96)	.14***	3.30 (3.49)	3.92 (3.90)	.17***
Dysfunctional family history	9.81 (2.84)	9.34 (2.84)	.17***	9.49 (2.63)	9.12 (2.68)	.14***	9.97 (2.93)	9.65 (3.03)	.11***

***$p<.001$

Table 2.6. *Need scales standardized score comparisons for entire sample (N=57,747).*

	Total Sample (n=57,747)			Minimal/Low Risk (n=27,791)			Moderate/High Risk (n=29,956)		
	Early Adult (n=25,309) M(SD)	**Older Adult (n=32,438) M(SD)**	**d**	**Early Adult (n=8,688) M(SD)**	**Older Adult (n=19,103) M(SD)**	**d**	**Early Adult (n=16,621) M(SD)**	**Older Adult (n=13, 335) M(SD)**	**d**
Antisocial values	.12 (1.06)	-.10 (.94)	.23***	-.12 (.90)	-.23 (.83)	.13***	.25 (1.11)	.09 (1.05)	.14***
Antisocial personality traits	.14 (1.06)	-.11 (.94)	.25***	-.19 (.85)	-.30 (.77)	.14***	.31 (1.12)	.16 (1.07)	.15***
Self-control issues	.07 (1.00)	-.06 (.99)	.13***	-.05 (.95)	-.14 (.95)	.10***	.13 (1.03)	.07 (1.04)	.07***
Substance use	-.03 (.97)	.03 (1.02)	.06***	-.25 (.78)	-.14 (.88)	.14***	.08 (1.04)	.27 (1.16)	.17***
Dysfunctional family history	.09 (1.00)	-.07 (1.00)	.17***	-.02 (.92)	-.15 (.94)	.14***	.15 (1.03)	.04 (1.06)	.11***

*p<.05, **p<.01, ***p<.001

Note: [a] Standardized scores are created by centering the mean of the variable at zero and setting the standard deviation equal to one. This allows for comparison whenever scales have different ranges.

Table 2.7. *OLS regression for self-control issues needs scale.*

	b	**SE**	**p**	**95% CI**
Gender	-.23	.04	<.001	-.31 – -.14
Race				
African American	-.36	.02	<.001	-.41 – -.32
Hispanic	-.46	.08	<.001	-.63 – -.30
Asian American	-1.02	.20	<.001	-1.41 – -.64
Native American	-.95	.07	<.001	-1.08 – -.82
Other	-.96	.19	<.001	-1.33 – -.58
Diploma	-.24	.02	<.001	-.29 – -.20
Any MH symptom	1.78	.06	<.001	1.64 – 1.89
Early adult	.19	.06	<.01	.08 – .30
High Risk	.45	.03	<.001	.40 – .50
Early adult*gender	.03	.06	.67	-.10 – .15
Early adult*mental health	-.07	.10	.47	-.27 – .12
Gender*mental health	-.26	.08	.001	-.41 – -.11
Early adult*gender*mental health	.09	.12	.46	-.14 – .32
F (14, 57732)				391.46
p				<.001
Pseudo r²				.09

Note: [a] Robust standard errors are reported.

Table 2.8. *OLS regression for dysfunctional family history needs scale.*

	b	**SE**	**p**	**95% CI**
Gender	-.28	.04	<.001	-.36 – -.20
Race				
African American	-.002	.02	.93	-.05 – .05
Hispanic	-.14	.08	.09	-.31 – .02
Asian American	-.51	.17	<.01	-.85 – -.17
Native American	-.41	.07	<.001	-.55 – -.27
Other	-.35	.21	.10	-.76 – .06
Diploma	-.52	.02	<.001	-.57 – -.47
Any MH symptom	.98	.07	<.001	.83– 1.12
Early adult	.48	.06	<.001	.37 – .59
High Risk	.41	.03	<.001	.36 – .46
Early adult*gender	-.24	.06	<.001	-.37 – -.12
Early adult*mental health	-.10	.11	.34	-.32 – .11
Gender*mental health	-.24	.06	<.001	-.37 – -.12
Early adult*gender*mental health	.20	.12	.12	-.05 – .44
F (14, 57732)				183.22
p				<.001
Pseudo r^2				.05

Note: [a] Robust standard errors are reported.

Table 2.9. *Negative Binomial regression for antisocial values needs scale.*

	IRR	SE	p	95% CI
Gender	1.17	.03	<.001	1.17 – 1.35
Race				
African American	1.14	.02	<.001	1.11 – 1.17
Hispanic	1.07	.05	.14	.98 – 1.16
Asian American	.91	.10	.42	.73 – 1.14
Native American	.86	.03	<.001	.81 – .92
Other	.83	.09	.07	.68 – 1.02
Diploma	.75	.01	<.001	.73 – .78
Any MH symptom	3.02	.11	<.001	2.81 – 3.26
Early adult	1.26	.04	<.001	1.17 – 1.35
High Risk	1.70	.02	<.001	1.66 – 1.75
Early adult*gender	1.02	.04	.58	.94 – 1.11
Early adult*mental health	.87	.05	.01	.78 – .97
Gender*mental health	.88	.04	.004	.81 – .96
Early adult*gender*mental health	1.05	.07	.40	.93 – 1.19
x^2				
p				<.001
Pseudo r^2				.04

Note: [a] Negative binomial was used due to the skewed distribution of the dependent variable. The difference between the mean and variance was statistically significantly different from zero.
[b] An exposure variable is included marked as the number of days between supervision begin date and exit date for supervision.
[c] Robust standard errors are reported.

Table 2.10. *Poisson Inverse Gaussian regression for antisocial personality traits needs scale.*

	IRR	SE	p	95% CI
Gender	1.31	.04	<.001	1.23 – 1.39
Race				
African American	.98	.01	.01	.96 – .99
Hispanic	.94	.03	.04	.89 – 1.00
Asian American	.83	.08	.05	.69 – 1.00
Native American	.61	.03	<.001	.56 – .67
Other	.63	.10	<.01	.47 – .86
Diploma	.59	.01	<.001	.58 – .61
Any MH symptom	1.63	.06	<.001	1.52 – 1.76
Early adult	1.34	.05	<.001	1.24 – 1.44
High Risk	1.57	.02	<.001	1.53 – 1.60
Early adult*gender	.89	.04	<.01	.82 – .96
Early adult*mental health	.90	.04	.03	.83 – .99
Gender*mental health	.88	.04	.001	.81 – .95
Early adult*gender*mental health	1.05	.05	.29	.96 – 1.16
Wald $x^2(14)$				6367.44
p				<.001

Note: [a] Poisson Inverse Gaussian was used due to the skewed distribution of the dependent variable. The antisocial personality traits scale had a high initial peak and far right skew.
[b] Robust standard errors are reported.

Table 2.11. *Logistic regression analyses of presence of a probation violation for total sample.*

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	*p*	*OR*	*p*	*OR*	*p*	*OR*	*p*	*OR*	*p*
Gender	.88	<.001	.86	<.001	.86	<.001	.87	<.001	.86	<.001
Race	1.02	.14	1.03	.002	1.03	.002	1.03	.002	1.03	.002
Diploma	.77	<.001	.83	<.001	.83	<.001	.83	<.001	.83	<.001
Any MH symptom	1.16	<.001	1.02	.45	1.02	.45	1.02	.39	1.02	.43
Early adult	1.10	<.001	1.08	<.001	1.07	.004	.98	.51	1.08	<.001
High Risk	2.51	<.001	2.31	<.001	2.31	<.001	2.31	<.001	2.31	<.001
Antisocial values			1.03	<.001	1.02	<.001	1.02	<.001	1.02	<.001
Antisocial personality traits			1.09	<.001	1.09	<.001	1.05	<.001	1.09	<.001
Self-control issues			1.01	.07	1.01	.07	1.01	.07	1.00	.58
Dysfunctional family history			1.01	<.001	1.01	<.001	1.01	<.001	1.01	<.001
Substance abuse			1.02	<.001	1.02	<.001	1.02	<.001	1.02	<.001
Early adult*antisocial values					1.00	.94				
Early adult*antisocial traits							1.07	<.001		
Early adult*self-control issues									1.02	.001
x^2		3425.92		3923.91		3923.92		3960.36		3935.87
p		<.001		<.001		<.001		<.001		<.001
Pseudo r^2		.05		.05		.05		.05		.05

Table 2.12. *Number of violations for subsamples.*

	Total Sample (n=57,747)			Early adult only (n=25,309)			
	Total Sample (n=57,747) M(SD) Range	**Early Adult (n=25,309) M(SD) Range**	**Older Adult (n=32,438) M(SD) Range**	**Male (n=19,056) M(SD) Range**	**Female (n=6,253) M(SD) Range**	**No MH (n=16,593) M(SD) Range**	**Any MH (n=8,716) M(SD) Range**
Number of violations	4.19 (6.14) 0-310	5.04 (7.18) 0-310	3.53 (5.09) 0-100	5.31 (7.47) 0-310	4.21 (6.14) 0-78	5.04 (7.50) 0-310	5.06 (6.52) 0-106

Table 2.13. *Zero-inflated negative binomial regression for number of violations.*

	b	exp(b)	p
Gender	0.03	1.03	<.05
Race-African American	-0.10	1.11	<.001
Diploma	-0.06	1.06	<.001
High risk	0.30	1.35	<.001
Mental health symptoms	-0.09	1.09	<.001
Early adult	0.20	1.22	<.001
Antisocial personality traits	0.01	1.01	<.01
Self-control issues	0.01	1.01	<.01
Antisocial values	0.001	--	0.69
Dysfunctional family history	0.004	1.00	<.05
Substance use	0.02	1.02	<.001
Zero-inflated model			
Gender	0.20	1.22	<.001
Diploma	0.34	1.40	<.001
High risk	-0.83	2.29	<.001
Early adult	.004	--	.88
Mental health symptoms	-0.02	--	0.51
Antisocial personality traits	-0.09	1.09	<.001
Self-control issues	-0.01	1.01	<.01
Antisocial values	-0.02	1.02	<.001
Dysfunction family history	-0.01	1.01	<.01
Substance use	-0.04	1.04	<.001
African American	-0.92	2.51	<.001
x^2			2296.68
p			<.001

Table 2.14. *Early adult sample characteristics by gender (N=25,309).*

Variables	Female n=6,253 n(%)	Male n=19,056 n(%)	Test statistic	p
Race				
White	3,169 (50.68)	8,479 (44.50)	$x^2(5)$=149.29	<.001
Black	2,798 (44.75)	9,097 (47.74)		
Hispanic	136 (2.17)	454 (2.38)		
Asian American	20 (.32)	82 (.43)		
Native American	110 (1.76)	882 (4.63)		
Other	20 (.32)	62 (.33)		
High School Diploma				
Yes	3,029 (48.44)	7,725 (40.54)	$x^2(1)$=120.32	<.001
No	3,224 (51.56)	11,331 (59.46)		
Mental health symptom	2,082 (33.30)	6,634 (34.81)	$x^2(1)$=4.80	<.05
RNA risk level				
1 Extreme	524 (8.38)	6,542 (34.33)	$x^2(4)$=4200.00	<.001
2 High	1,999 (31.97)	7,556 (39.65)		
3 Moderate	2,701 (43.20)	4,804 (25.21)		
4 Low	1,029 (16.46)	154 (.81)		
5 Minimal	0	0		
High Risk	2,523 (40.35)	14,098 (73.98)	$x^2(1)$=2400.00	<.001
RNA need level				
1 Extreme	1,862 (29.78)	5,028 (26.39)	$x^2(4)$=252.00	<.001
2 High	810 (12.95)	4,056 (21.28)		
3 Moderate	2,322 (37.13)	6,293 (33.02)		
4 Low	1,017 (16.26)	3,224 (16.92)		
5 Minimal	242 (3.87)	455 (2.39)		
Has a violation				
Yes	4,058 (64.90)	13,396 (70.30)	$x^2(1)$=64.17	<.001
No	2,195 (35.10)	5,660 (29.70)		
Number of violations (M(SD))	4.21 (6.14)	5.31 (7.47)	t(25307)=-10.53; d=.15	<.001

Table 2.15. *Need scale raw score comparisons for early adult sample males and females.*

	Early adults (n=25,309)			Minimal/Low Risk (n=27,791)			Moderate/High Risk (n=29,956)		
	Male (n=19,056) M(SD)	**Female (n=6,253) M(SD)**	**d**	**Male (n=4,958) M(SD)**	**Female (n=3,730) M(SD)**	**d**	**Male (n=14,098) M(SD)**	**Female (n=2,523) M(SD)**	**d**
Antisocial values	2.99 (3.03)	2.37 (2.71)	.21***	2.28 (2.60)	1.99 (2.43)	.11***	3.24 (3.13)	2.93 (3.00)	.10***
Antisocial personality traits	1.75 (1.87)	1.33 (1.65)	.23***	1.11 (1.47)	1.03 (1.43)	.06**	1.98 (1.94)	1.79 (1.83)	.10***
Self-control issues	11.20 (2.91)	11.30 (2.94)	.04*	10.76 (2.69)	11.03 (2.82)	.10***	11.35 (2.97)	11.70 (3.06)	.12***
Substance use	3.07 (3.28)	2.42 (3.20)	.20***	2.41 (2.59)	1.85 (2.65)	.21***	3.30 (3.45)	3.27 (3.71)	-
Dysfunctional family history	9.71 (2.78)	10.08 (3.00)	.13***	9.28 (2.44)	9.77 (2.84)	.19***	9.87 (2.88)	10.56 (3.15)	.24***

*p<.05, **p<.01, ***p<.001

Table 2.16. *Need scale standardized score comparisons for early adult sample males and females.*

	Early adults (n=25,309)			Minimal/Low Risk (n=8,688)			Moderate/High Risk (n=16,621)		
	Male (n=19,056) M(SD)	**Female (n=6,253) M(SD)**	**d**	**Male (n=4,958) M(SD)**	**Female (n=3,730) M(SD)**	**d**	**Male (n=14,098) M(SD)**	**Female (n=2,523) M(SD)**	**d**
Antisocial values	.18 (1.08)	-.04 (.97)	.21***	-.07 (.93)	-.17 (.87)	.11***	.27 (1.12)	.16 (1.07)	.10***
Antisocial personality traits	.20 (1.09)	-.04 (.97)	.23***	-.17 (.86)	-.22 (.83)	.06**	.33 (1.13)	.22 (1.06)	.10***
Self-control issues	.06 (1.00)	.10 (1.01)	.04*	-.09 (.93)	.004 (.97)	.10***	.12 (1.02)	.24 (1.05)	.12***
Substance use	.01 (.97)	-.18 (.95)	.20***	-.18(.77)	-.25 (.79)	.21***	.08 (1.03)	.07 (1.10)	-
Dysfunctional family history	.06 (.98)	.19 (1.05)	.13***	-.09 (.85)	.08 (1.00)	.19***	.11 (1.01)	.36 (1.11)	.24***

*p<.05, **p<.01, ***p<.001

Note: [a] Standardized scores are created by centering the mean of the variable at zero and setting the standard deviation equal to one. This allows for comparison whenever scales have different ranges.

Table 2.17. *Early adult sample characteristics my mental health symptomology (N=25,309).*

Variables	No MH n=16,593 n(%)	Any MH n=8,716 n(%)	Test statistic	p
Gender				
Male	12,422 (74.86)	6,634 (76.11)	$x^2(1)=4.80$	<.05
Female	4,171 (25.14)	2,082 (23.89)		
Race				
White	7,983 (48.11)	3,665 (42.05)	$x^2(5)=122.52$	<.001
Black	7,385 (44.51)	4,510 (51.74)		
Hispanic	409 (2.46)	181 (2.08)		
Asian American	68 (.41)	34 (.39)		
Native American	696 (4.19)	296 (3.40)		
Other	52 (.31)	30 (.34)		
High School Diploma				
Yes	7,231 (43.58)	3,523 (40.42)	$x^2(1)=23.33$	<.001
No	9,362 (56.42)	5,193 (59.58)		
RNA risk level				
1 Extreme	4,276 (25.77)	2,790 (32.01)	$x^2(3)=176.07$	<.001
2 High	6,224 (37.51)	3,331 (38.22)		
3 Moderate	5,204 (31.36)	2,301 (26.40)		
4 Low	889 (5.36)	294 (3.37)		
5 Minimal	0	0		
High Risk	10,500 (63.28)	6,121 (70.23)	$x^2(1)=122.34$	<.001
RNA need level				
1 Extreme	3,914 (23.59)	2,976 (34.14)	$x^2(4)=1600.00$	<.001
2 High	2,396 (14.44)	2,470 (28.34)		
3 Moderate	6,315 (38.06)	2,300 (26.39)		
4 Low	3,296(19.86)	945 (10.84)		
5 Minimal	672 (4.05)	25 (.29)		
Has a violation				
Yes	11,243 (67.76)	6,211 (71.26)	$x^2(1)=32.75$	<.001
No	5,350 (32.24)	2,505(28.74)		
Number of violations (m/sd)	5.04 (7.50)	5.04 (6.52)	t(25307)=-0.11;	.91

Table 2.18. *Need scale raw score comparisons for early adult sample by mental health symptomology.*

	Early adults (n=25,309)			Minimal/Low Risk (n=8,688)			Moderate/High Risk (n=16,621)		
	No MH (n=16,593) M(SD)	**Any MH (n=8,716) M(SD)**	**d**	**No MH (n=6,093) M(SD)**	**Any MH (n=2,595) M(SD)**	**d**	**No MH (n=10,500) M(SD)**	**Any MH (n=6,121) M(SD)**	**d**
Antisocial values	2.08 (2.45)	4.27(3.31)	.79***	1.62 (2.11)	3.43 (2.95)	.76***	2.35 (2.59)	4.62 (3.39)	.78***
Antisocial personality traits	1.44 (1.66)	2.05 (2.04)	.34***	.95 (1.34)	1.37 (1.66)	.29***	1.72 (1.76)	2.34 (2.12)	.33***
Self-control issues	10.68 (2.78)	12.26 (2.90)	.56***	10.39 (2.62)	12.00 (2.73)	.61***	10.84 (2.86)	12.37 (2.97)	.53***
Substance use	2.53(3.03)	3.64 (3.57)	.34***	1.92 (2.49)	2.74 (2.87)	.31***	2.88(3.26)	4.01 (3.76)	.33***
Dysfunctional family history	9.52 (2.69)	10.36 (3.04)	.30***	9.27 (2.51)	10.01 (2.81)	.28***	9.66 (2.77)	10.51 (3.12)	.29***

*$p<.05$, **$p<.01$, ***$p<.001$

Table 2.19. *Need scale standardized score comparisons for early adult sample by mental health symptomology.*

	Early adults (n=25,309)			Minimal/Low Risk (n=8,688)			Moderate/High Risk (n=16,621)		
	No MH (n=16,593) M(SD)	Any MH (n=8,716) M(SD)	d	No MH (n=6,093) M(SD)	Any MH (n=2,595) M(SD)	d	No MH (n=10,500) M(SD)	Any MH (n=6,121) M(SD)	d
Antisocial values	-.14 (.88)	.64 (1.18)	.79***	-.30 (.75)	.34 (1.05)	.76***	-.05 (.93)	.76 (1.21)	.78***
Antisocial personality traits	.02 (.96)	.38 (1.19)	.34***	-.27 (.78)	-.02 (.96)	.29***	.18 (1.02)	.54 (1.23)	.33***
Self-control issues	-.12 (.96)	.43 (1.00)	.56***	-.21 (.90)	.34 (.94)	.61***	-.06 (.98)	.47 (1.02)	.53***
Substance use	-.15 (.90)	.18 (1.06)	.34***	-.33 (.74)	-.08 (.85)	.31***	-.04 (.97)	.29 (1.12)	.33***
Dysfunctional family history	-.01 (.94)	.29 (1.07)	.30***	-.10 (.88)	.16 (.99)	.28***	.04 (.97)	.34 (1.09)	.29***

*p<.05, **p<.01, ***p<.001

Note: [a] Standardized scores are created by centering the mean of the variable at zero and setting the standard deviation equal to one. This allows for comparison whenever scales have different ranges.

Table 2.20. *Logistic regression with presence of violation outcome for early adult sample with gender interactions.*

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	p	OR	p	OR	p	OR	p	OR	p
Gender	.89	<.001	.87	<.001	.87	<.001	.87	<.001	.98	.78
Race	1.01	.25	1.03	<.01	1.03	<.01	1.03	<.01	1.03	<.01
Diploma	.77	<.001	.83	<.001	.83	<.001	.83	<.001	.83	<.001
Any MH symptom	1.16	<.001	1.02	.40	1.02	.40	1.02	.40	1.02	.42
High Risk	2.44	<.001	2.26	<.001	2.26	<.001	2.26	<.001	2.26	<.001
Age (continuous)			.99	<.001	.99	<.001	.99	<.001	.99	<.001
Antisocial values			1.02	<.001	1.02	<.01	1.02	<.001	1.02	<.001
Antisocial personality traits			1.09	<.001	1.09	<.001	1.08	<.001	1.09	<.001
Self-control issues			1.01	.08	1.01	.08	1.01	.08	1.01	<.05
Dysfunctional family history			1.01	<.001	1.01	<.001	1.01	<.001	1.01	<.001
Substance abuse			1.02	<.001	1.02	<.001	1.02	<.001	1.02	<.001
Gender*antisocial values					1.00	.93				
Gender*antisocial traits							1.01	.63		
Gender*self-control issues									.99	.15
x^2		3459.65		3947.42		3947.42		3947.65		3949.48
p		<.001		<.001		<.001		<.001		<.001
Pseudo r^2		.05		.05		.05		.05		.05

Table 2.21. *Logistic regression with presence of violation outcome for early adult sample with mental health interactions.*

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	*p*	*OR*	*p*	*OR*	*p*	*OR*	*p*	*OR*	*p*
Gender	.89	<.001	.87	<.001	.87	<.001	.87	<.001	.87	<.001
Race	1.01	.25	1.03	<.01	1.03	<.01	1.03	<.01	1.03	<.01
Diploma	.77	<.001	.83	<.001	.83	<.001	.83	<.001	.83	<.001
Any MH symptom	1.16	<.001	1.02	.40	1.05	.13	1.03	.34	.96	.61
High Risk	2.44	<.001	2.26	<.001	2.26	<.001	2.26	<.001	2.26	<.001
Age			.99	<.001	.99	<.001	.99	<.001	.99	<.001
Antisocial values			1.02	<.001	1.03	<.001	1.02	<.001	1.02	<.001
Antisocial personality traits			1.09	<.001	1.09	<.001	1.09	<.001	1.09	<.001
Self-control issues			1.01	.08	1.01	.10	1.01	.09	1.00	.28
Dysfunctional family history			1.01	<.001	1.01	<.001	1.01	<.001	1.01	<.001
Substance abuse			1.02	<.001	1.02	<.001	1.02	<.001	1.02	<.001
MH*antisocial values					.99	.18				
MH*antisocial traits							.99	.65		
MH*self-control issues									1.01	.45
x^2		3459.65		3947.42		3949.20		3947.63		3947.98	
p		<.001		<.001		<.001		<.001		<.001	
Pseudo r^2		.05		.05		.05		.05		.05	

Table 2.22. *Zero-inflated negative binomial regression early adult sample.*

|	*b*	**exp(*b*)**	*p*
Gender	.07	1.07	<.001
Race-African American	-.08	1.08	<.001
Diploma	-.09	1.09	<.001
High risk	.30	1.35	<.001
Age (continuous)	-.02	1.02	<.001
Mental health symptoms	-.11	1.12	<.001
Antisocial personality traits	.02	1.02	<.001
Self-control issues	.01	1.01	.02
Antisocial values	<.01	--	.80
Dysfunctional family history	<.01	--	.64
Substance use	.02	1.02	<.001
Zero-inflated model			
Gender	.15	1.16	<.01
Diploma	.57	1.77	<.001
High risk	-.84	2.32	<.001
Age (continuous)	-.02	1.02	.002
Mental health symptoms	.10	1.11	.03
Antisocial personality traits	-.11	1.12	<.001
Self-control issues	-.03	1.03	<.001
Antisocial values	-.01	--	.56
Dysfunction family history	-.03	1.03	.001
Substance use	-.05	1.05	<.001
African American	-1.10	3.00	<.001
x^2			908.67
p			<.001
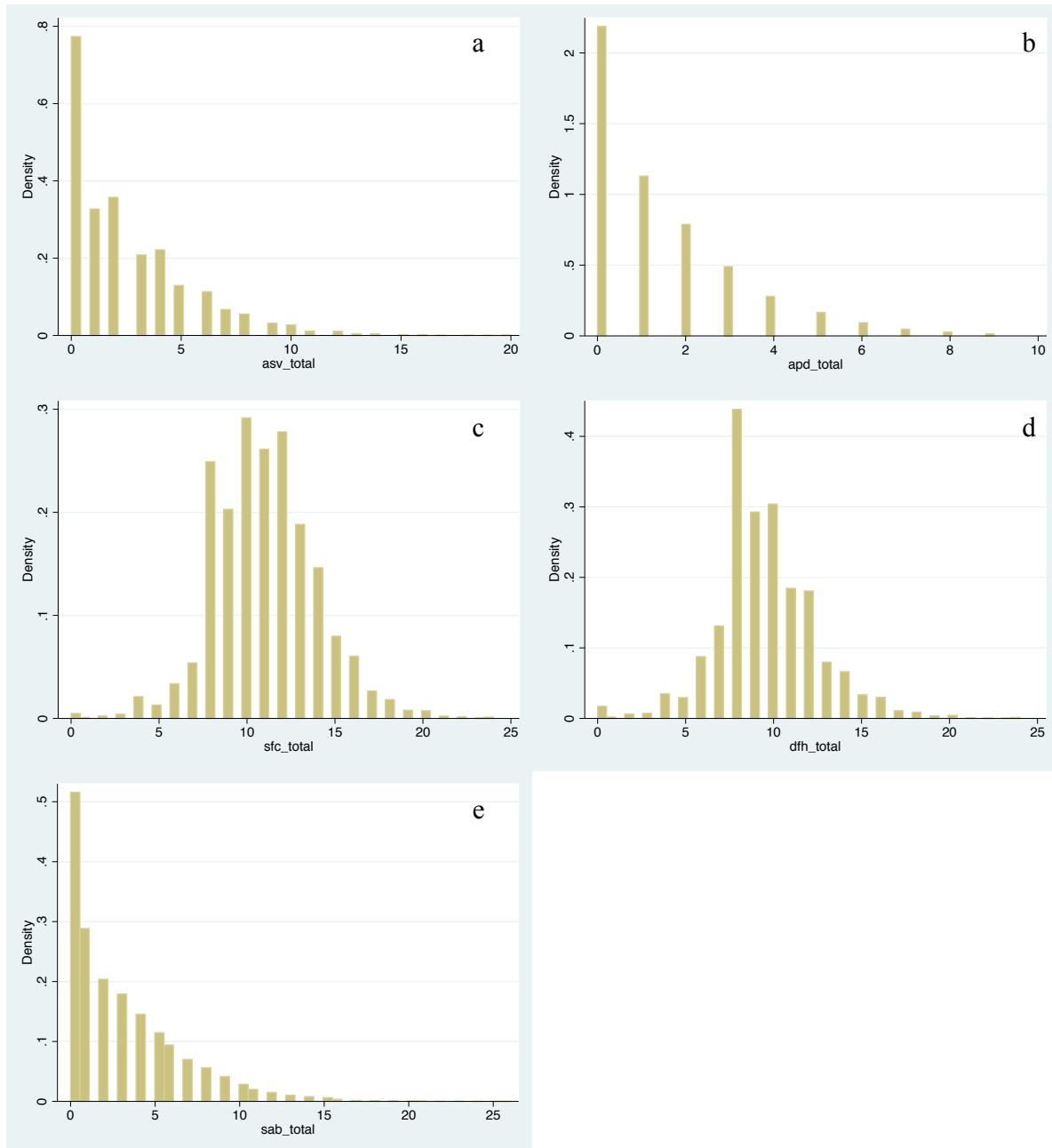
Figure 21. Needs scales distributions for the entire sample. (a) Antisocial values, (b) Antisocial personality traits, (c) self-control issues, (d) dysfunctional family history, (e) substance use
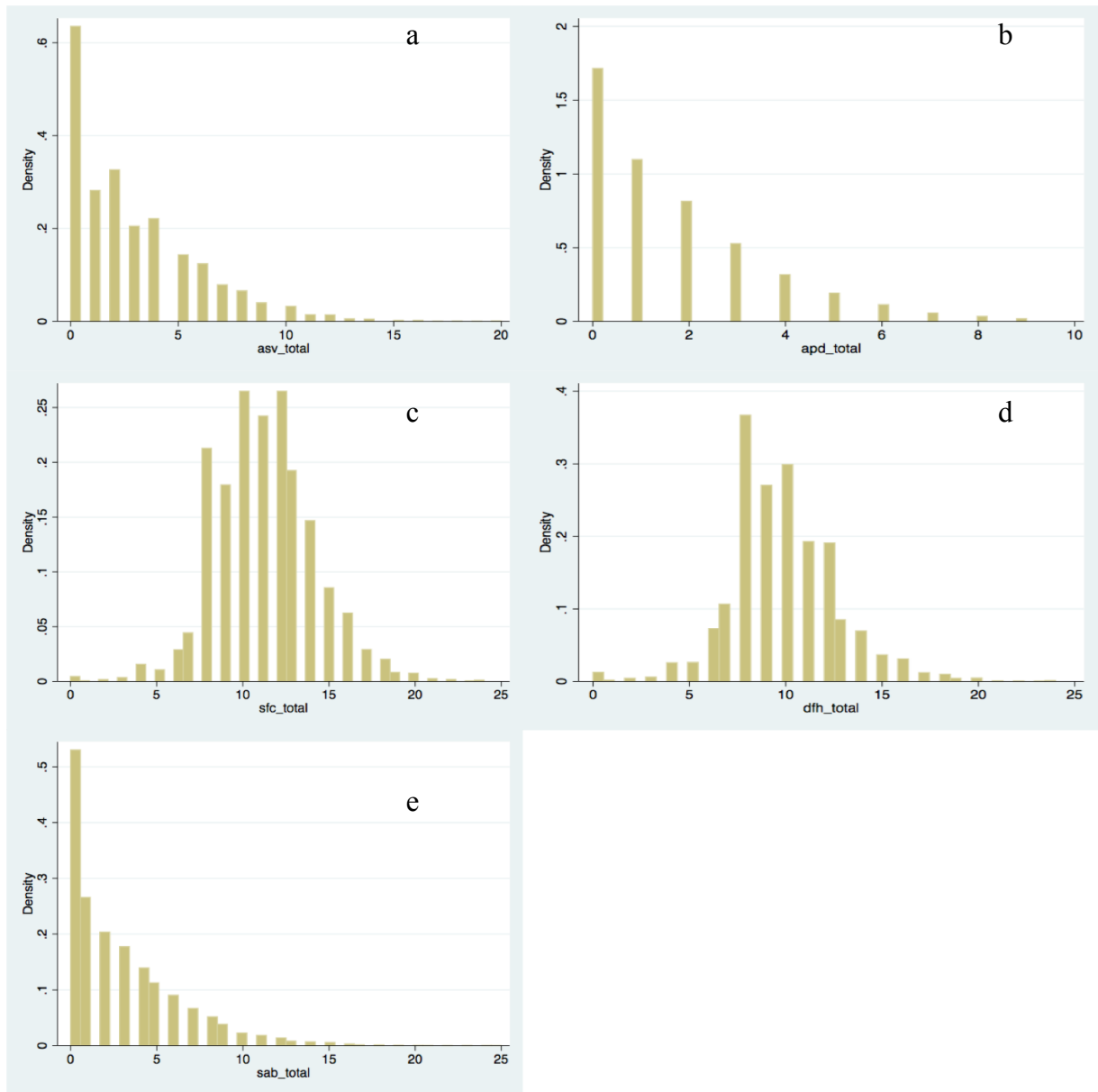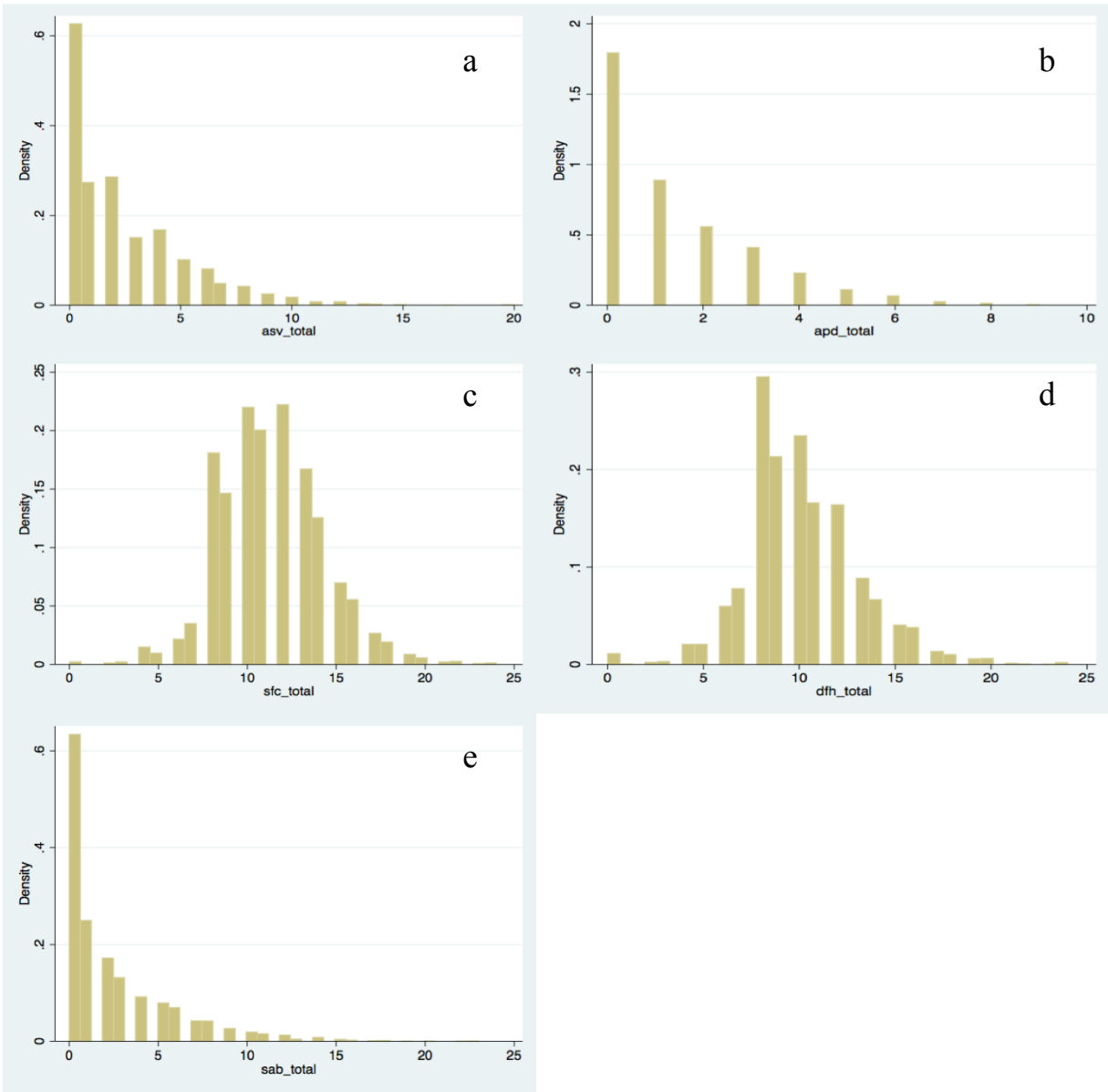
*Figure **Error! Bookmark not defined.*** Needs scales distributions for the early adult sample. (a) Antisocial values, (b) Antisocial personality traits, (c) self-control issues, (d) dysfunctional family history, (e) substance use
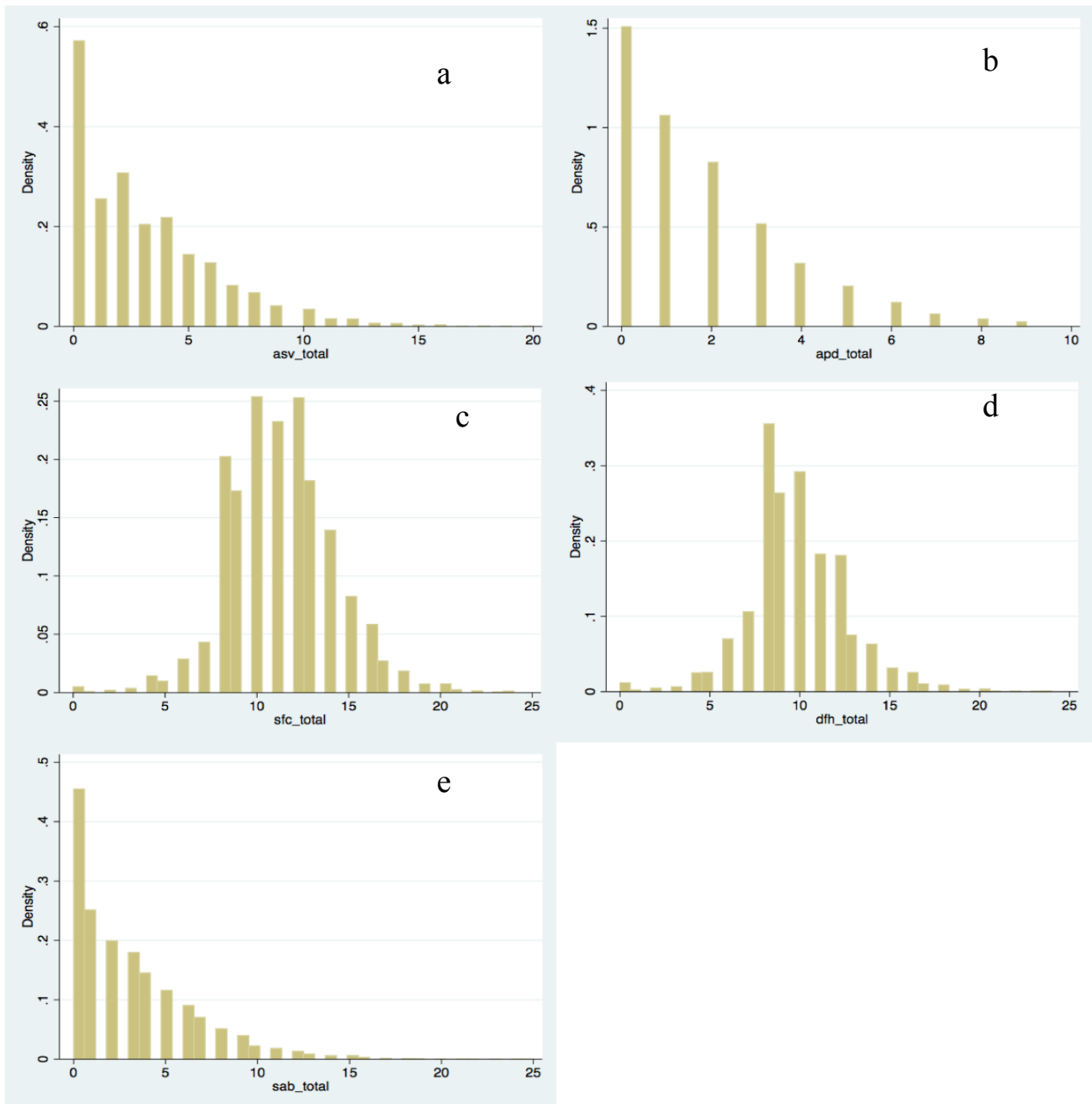
Figure 23. Needs scales distributions for the early adult female sample. (a) Antisocial values, (b) Antisocial personality traits, (c) self-control issues, (d) dysfunctional family history, (e) substance use

Figure 24. Needs scales distributions for the early adult male sample. (a) Antisocial values, (b) Antisocial personality traits, (c) self-control issues, (d) dysfunctional family history, (e) substance use
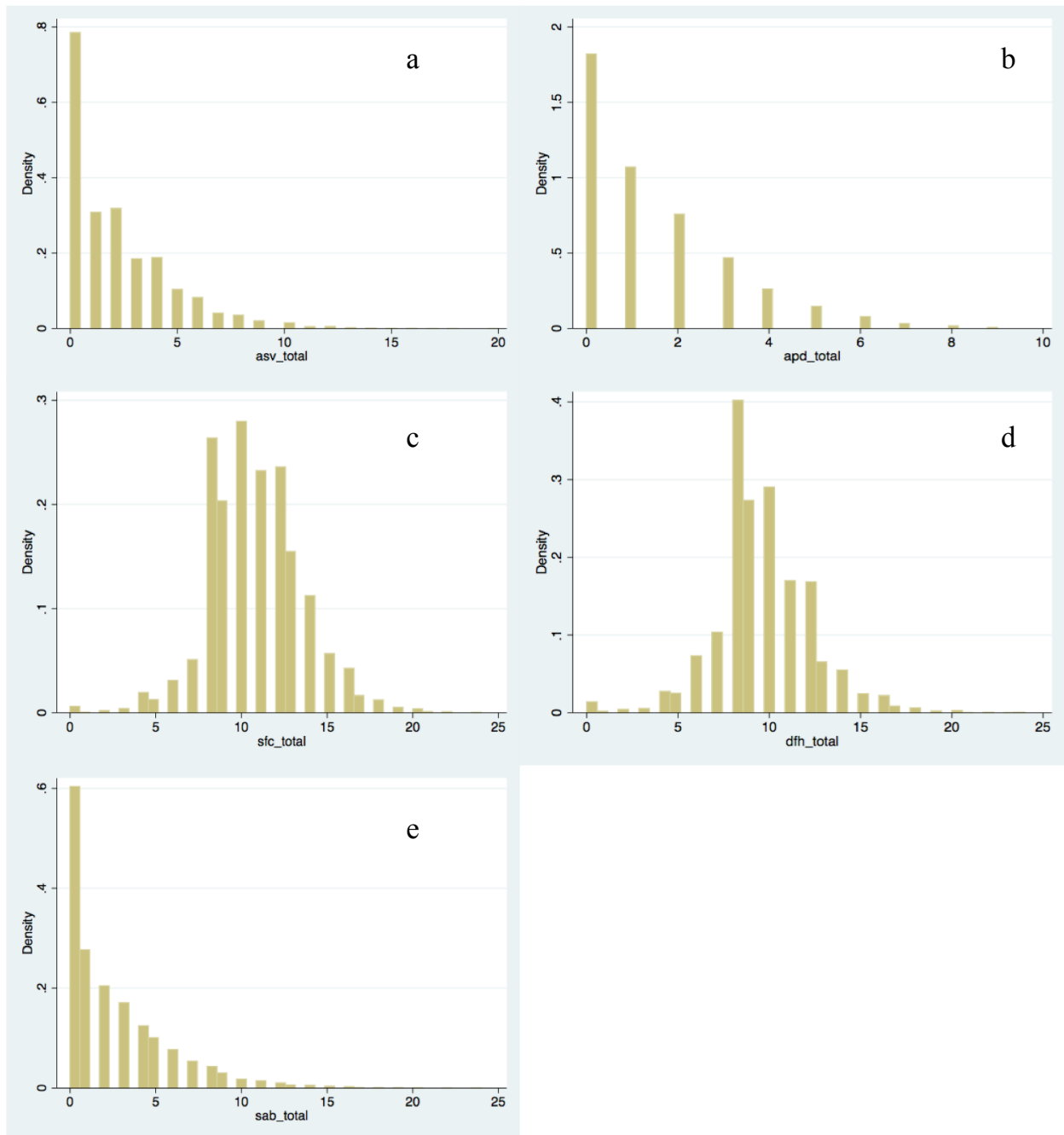
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Figure 25. Needs scales distributions for the early adult sample with no mental health symptomology. (a) Antisocial values, (b) Antisocial personality traits, (c) self-control issues, (d) dysfunctional family history, (e) substance use
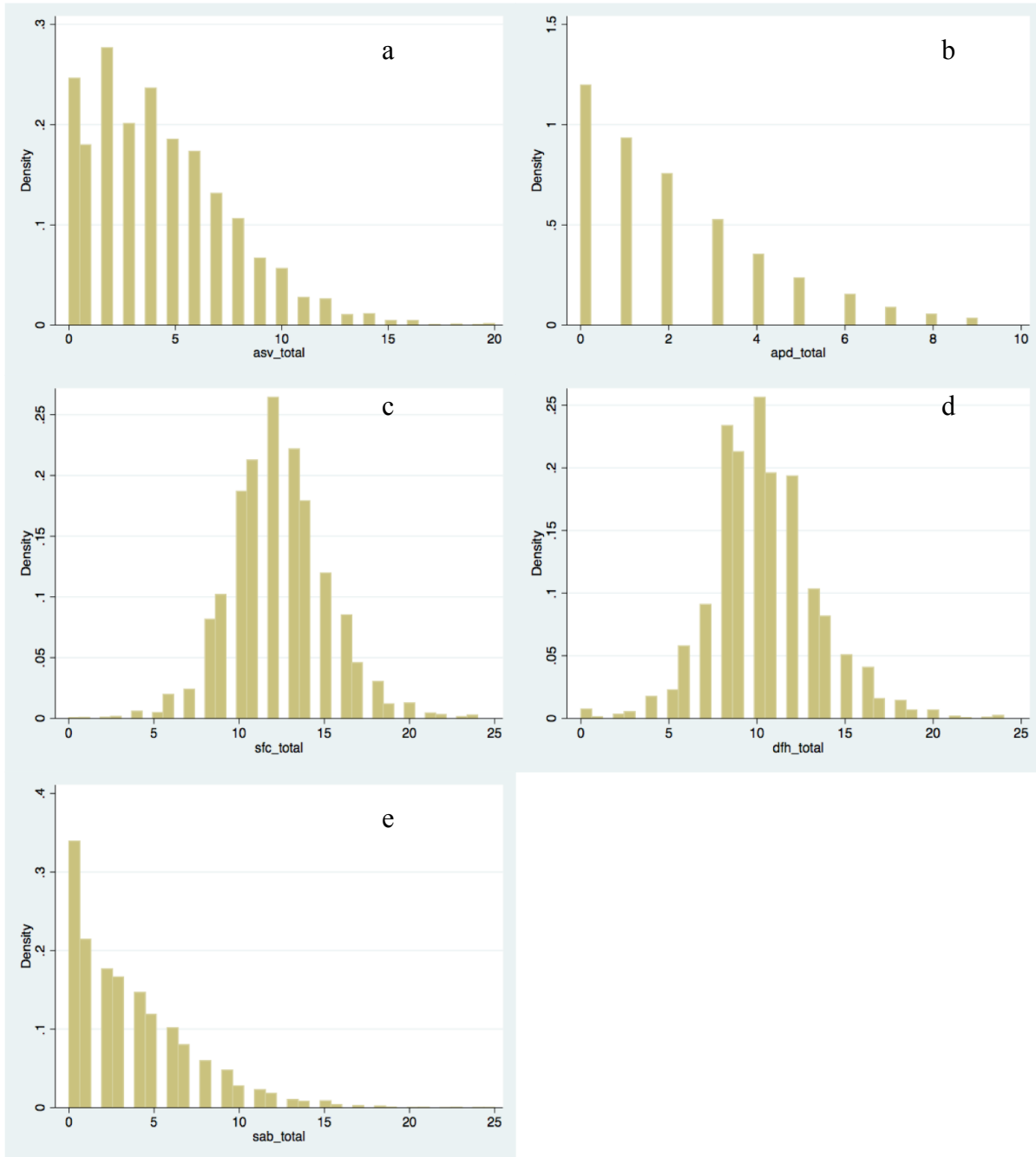
Figure 26. Needs scales distributions for the early adult sample with mental health symptomology. (a) Antisocial values, (b) Antisocial personality traits, (c) self-control issues, (d) dysfunctional family history, (e) substance use
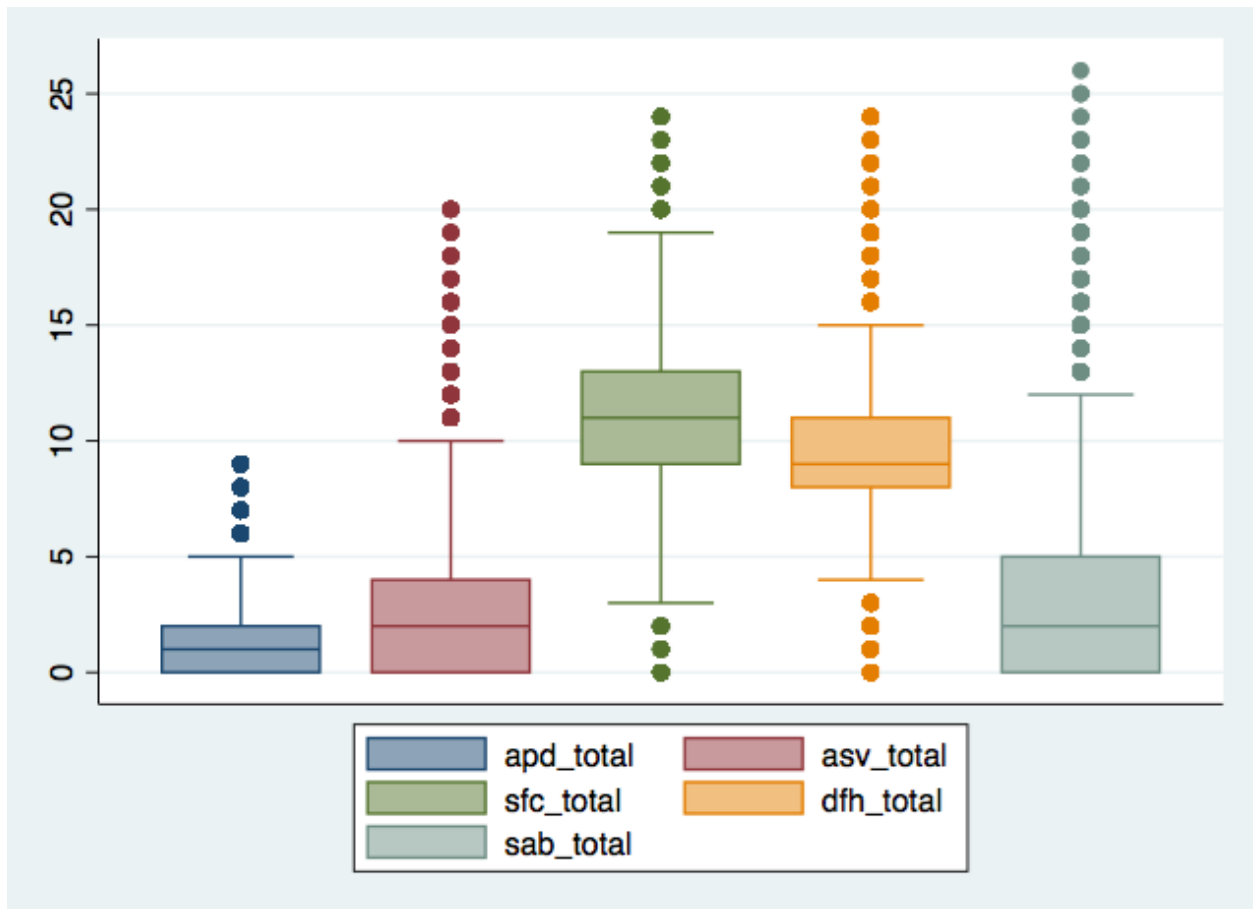
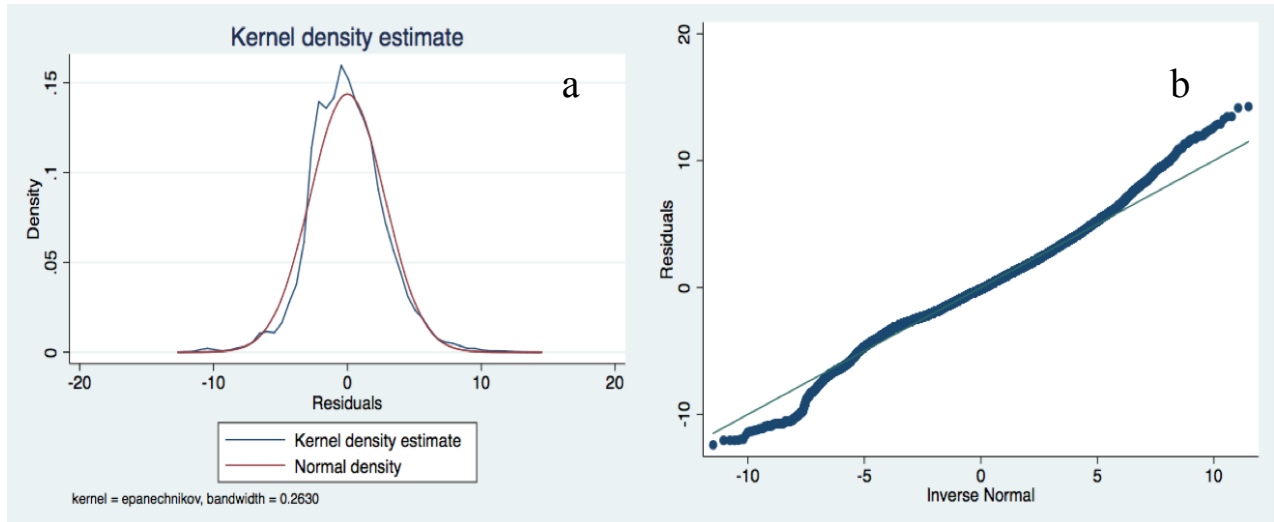*Figure 27.* Need scales distribution by mean and outliers.
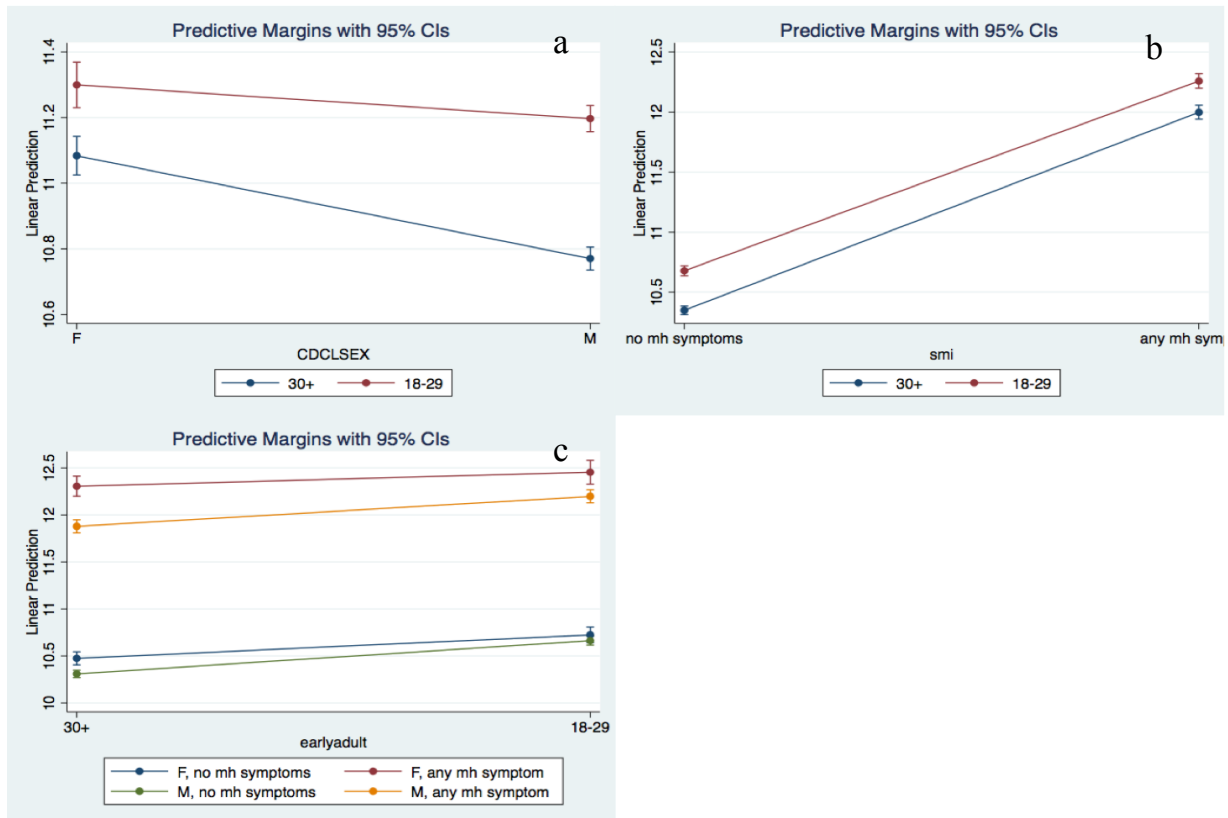
Figure 28. Self-control residual distributions.

Figure 29. Interaction terms for the self-control OLS model. (a) Interaction between age group and gender (b=.03, p=.67), (b) interaction between age group and mental health symptomology (b=-.07, p=.47), and (c) interaction among age group, gender, and mental health symptomology (b=.09, p=.46).
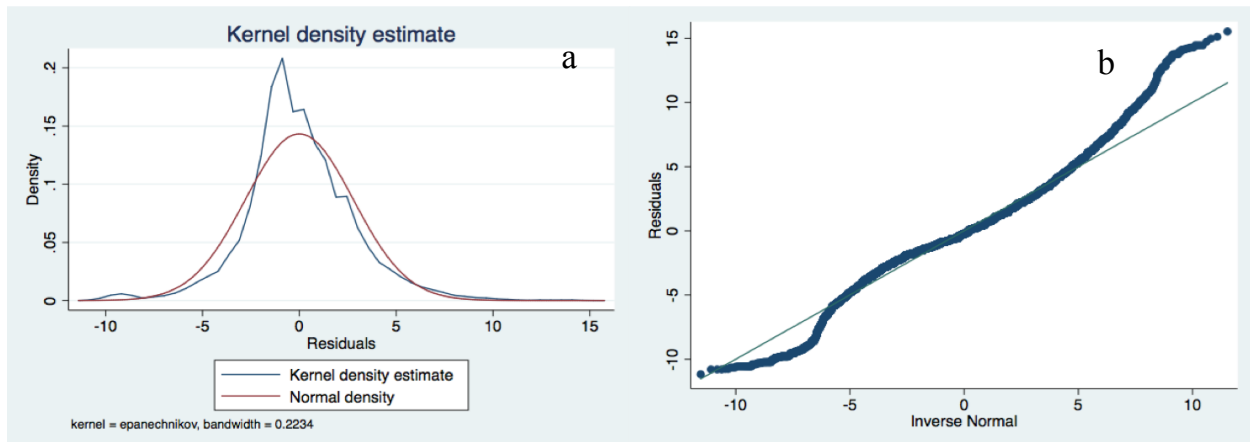
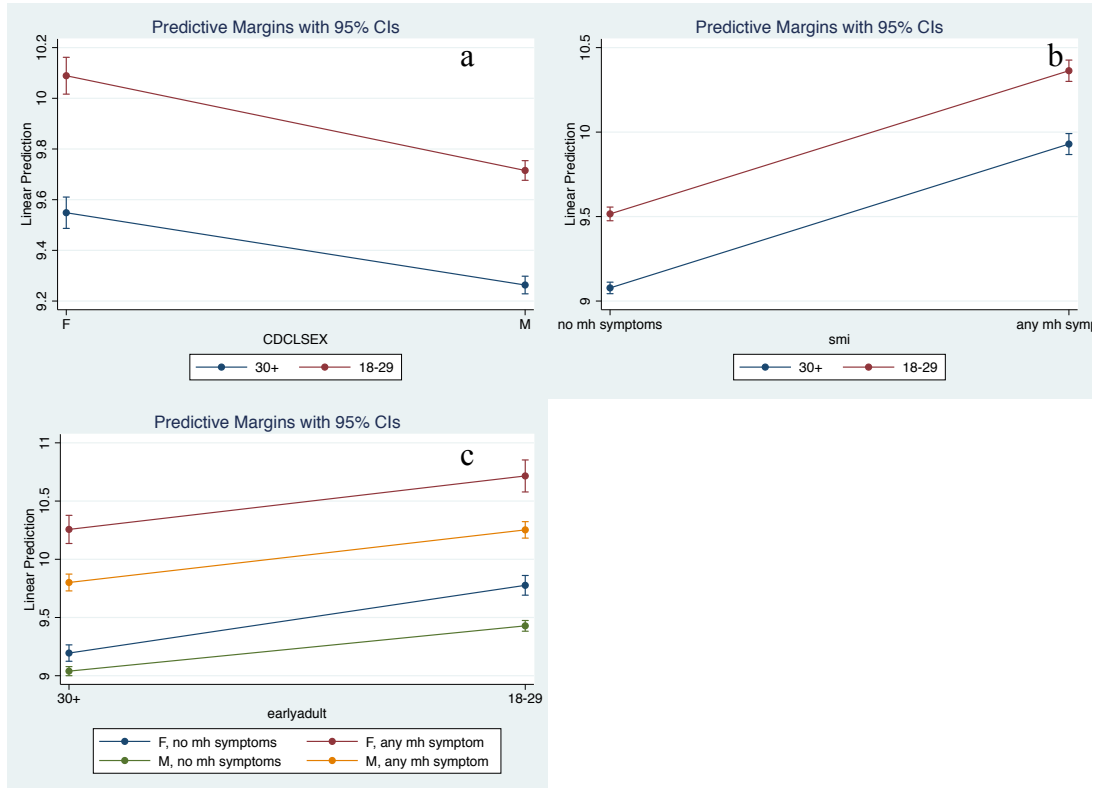*Figure 210.* Dysfunctional family history scale residual distributions.

Figure 211. Interaction terms for the dysfunctional family history OLS model. (a) Interaction between age group and gender (b=-.24, p<.001), (b) interaction between age group and mental health symptomology (b=-.10, p=.34), and (c) interaction among age group, gender, and mental health symptomology (b=.20, p=.12).
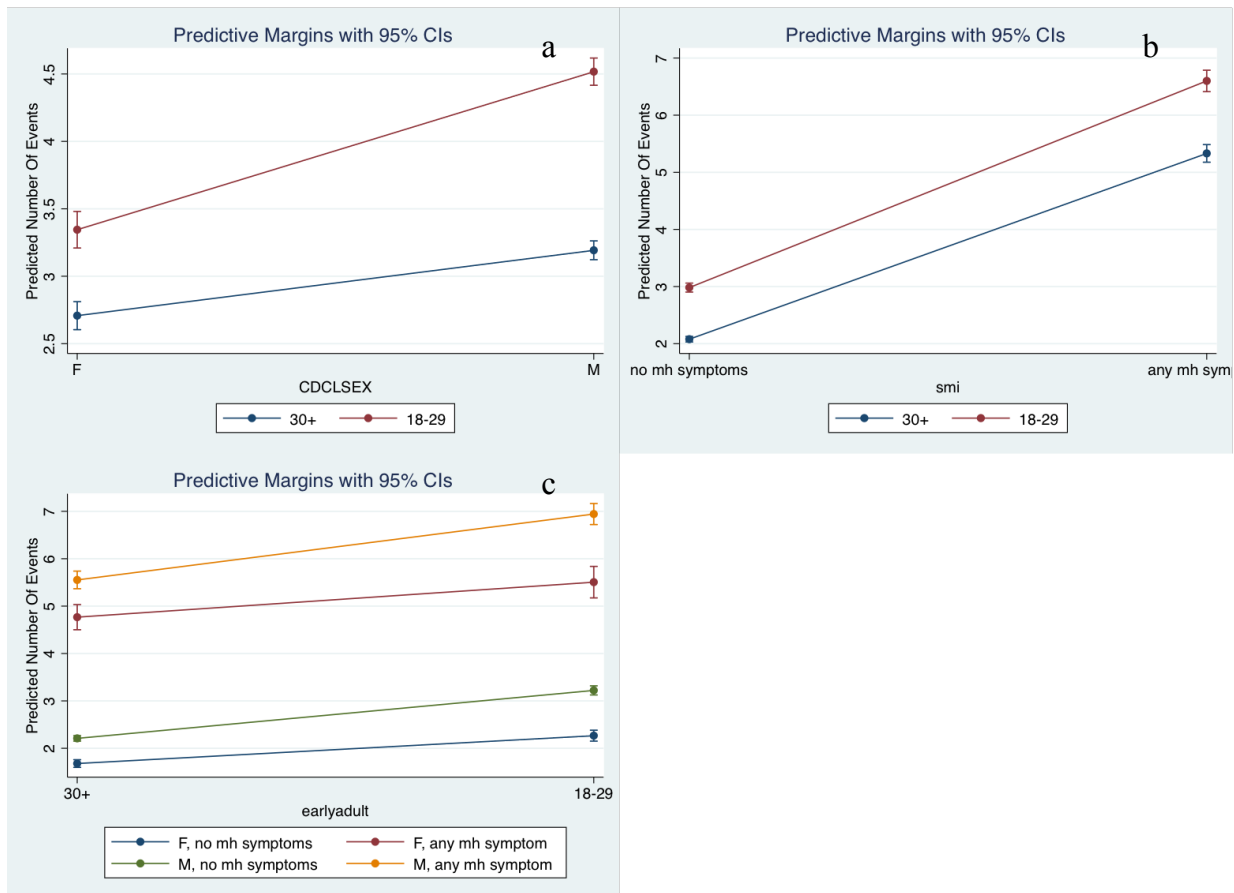
Figure 212. Interaction terms for the antisocial values Negative Binomial regression model. (a) Interaction between age group and gender (irr=1.02, p=.58), (b) interaction between age group and mental health symptomology (irr=.87, p=.01), and (c) interaction among age group, gender, and mental health symptomology (irr=1.05, p=.40).
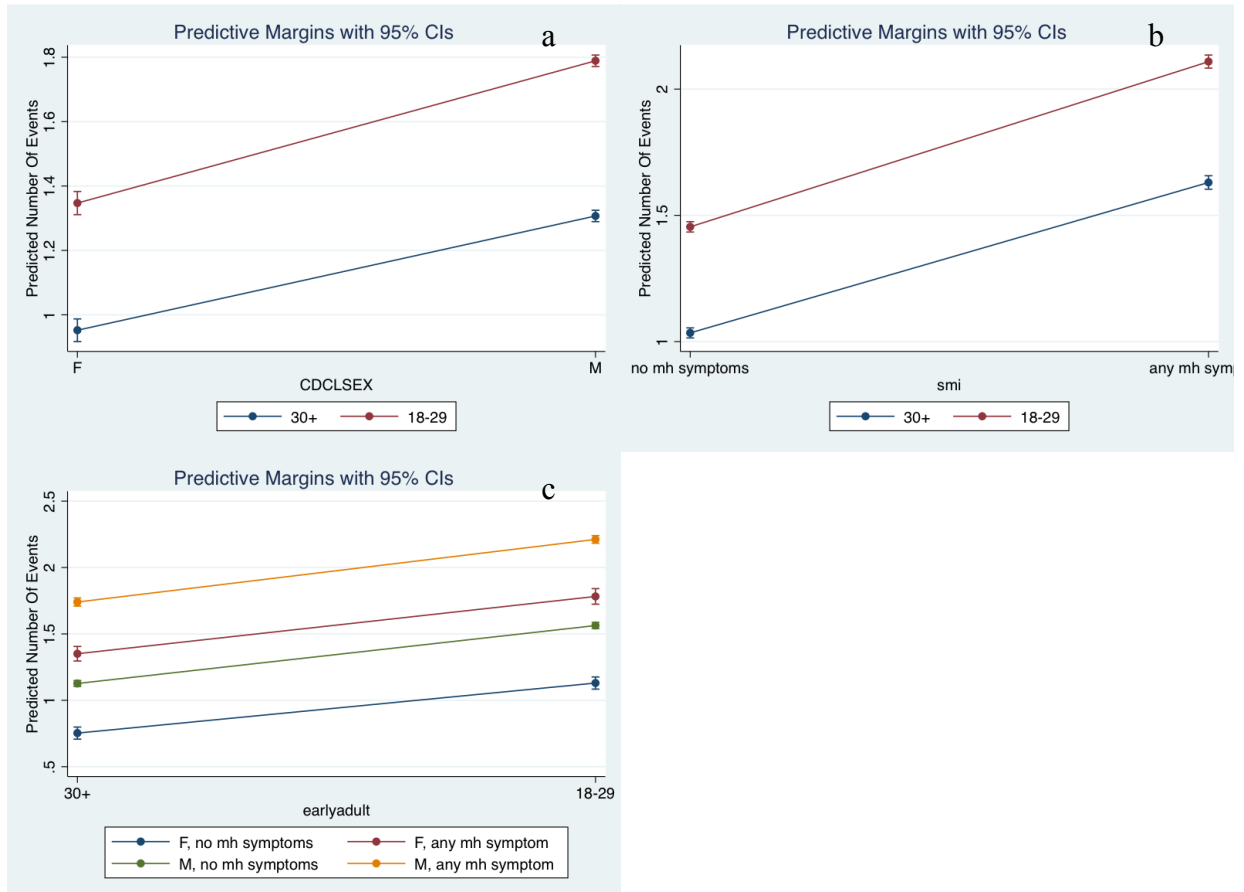
Figure 213. Interaction terms for the antisocial personality traits Poisson Inverse Gaussian regression model. (a) Interaction between age group and gender (irr=.89, p<.01), (b) interaction between age group and mental health symptomology (irr=.90, p<.05), and (c) interaction among age group, gender, and mental health symptomology (irr=1.05, p=.29).
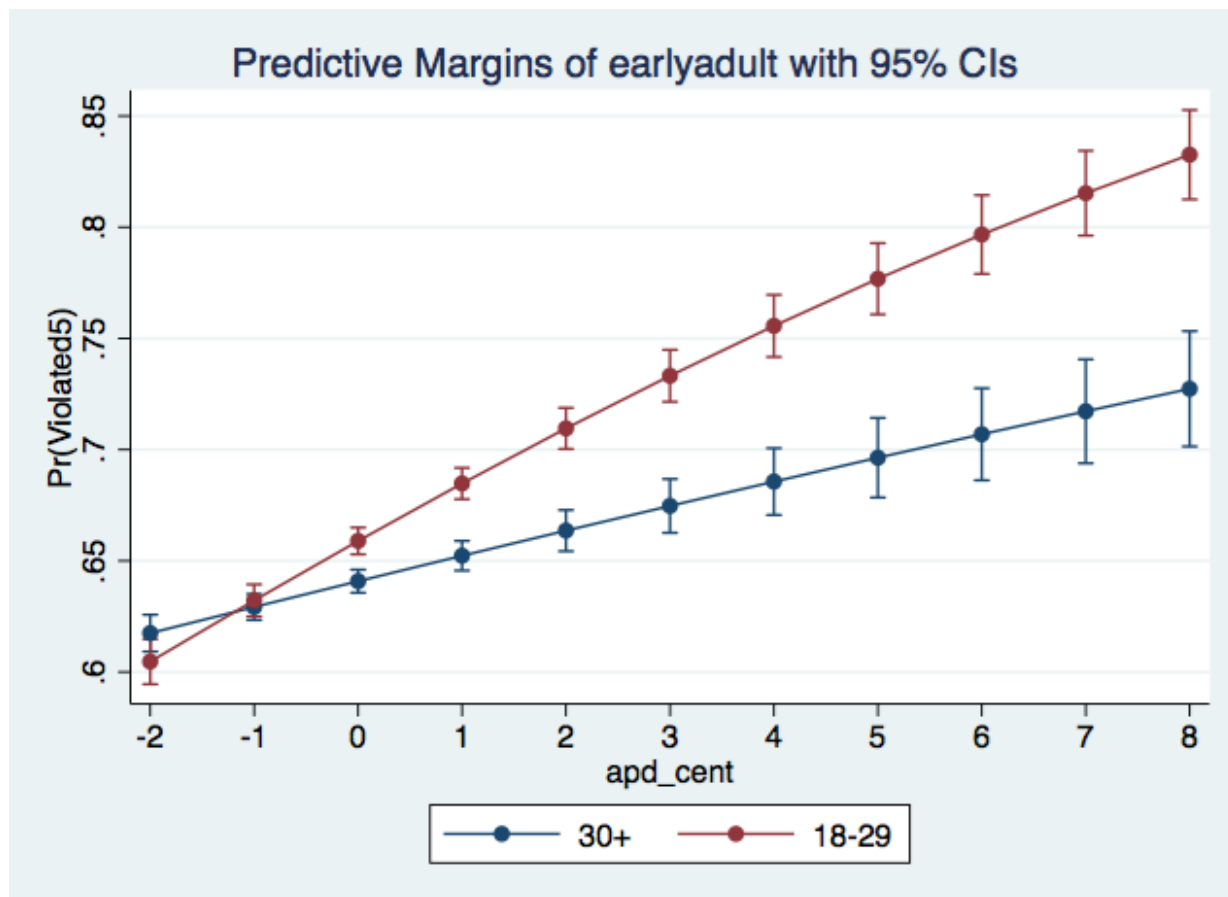
Figure 214. Logistic regression interaction model between age grouping and antisocial personality traits. Zero on apd_cent represents the mean score of the antisocial personality traits need scale.

Figure 215. Logistic regression interaction between age groupings and self-control issues. Zero on sfc_cent represents the mean score of the self-control issues need scale.
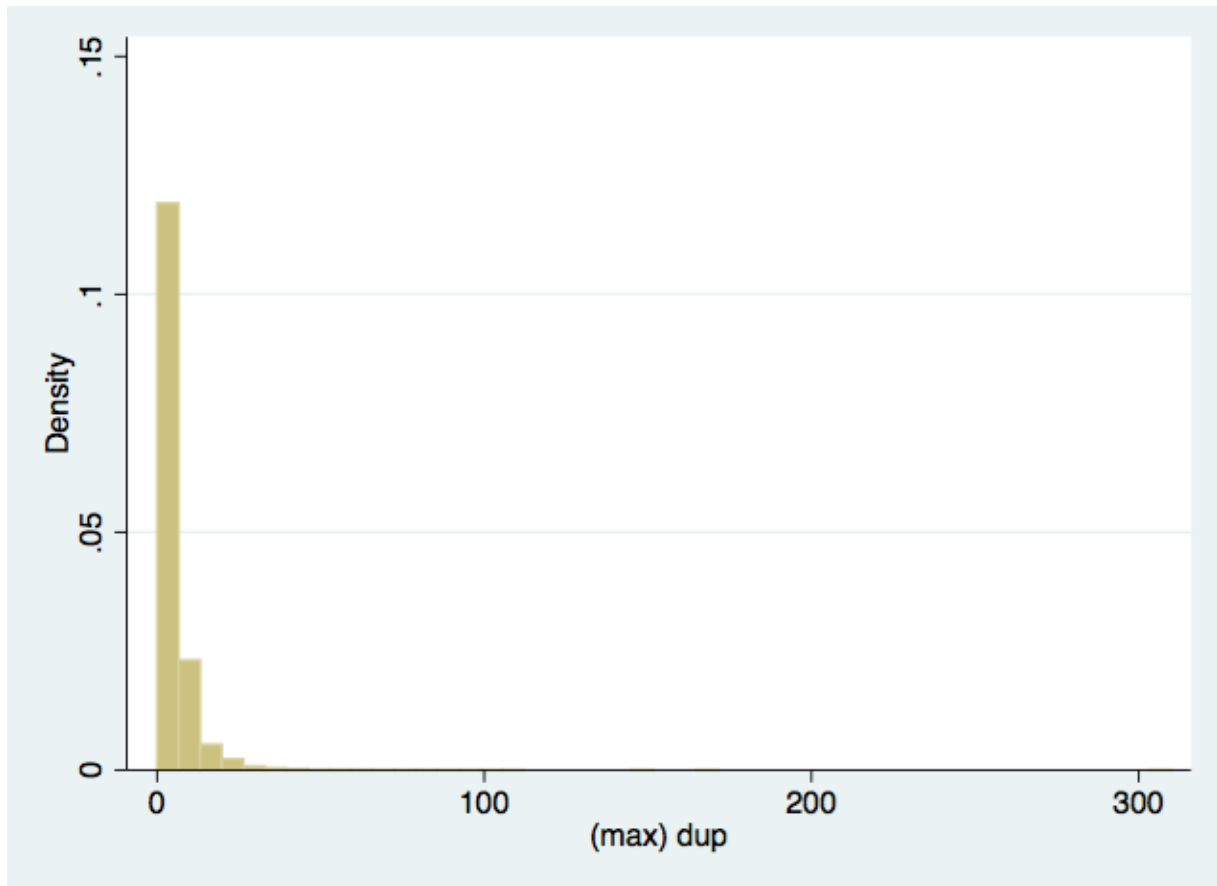
Figure 216. Distribution of number of violations of the total sample.
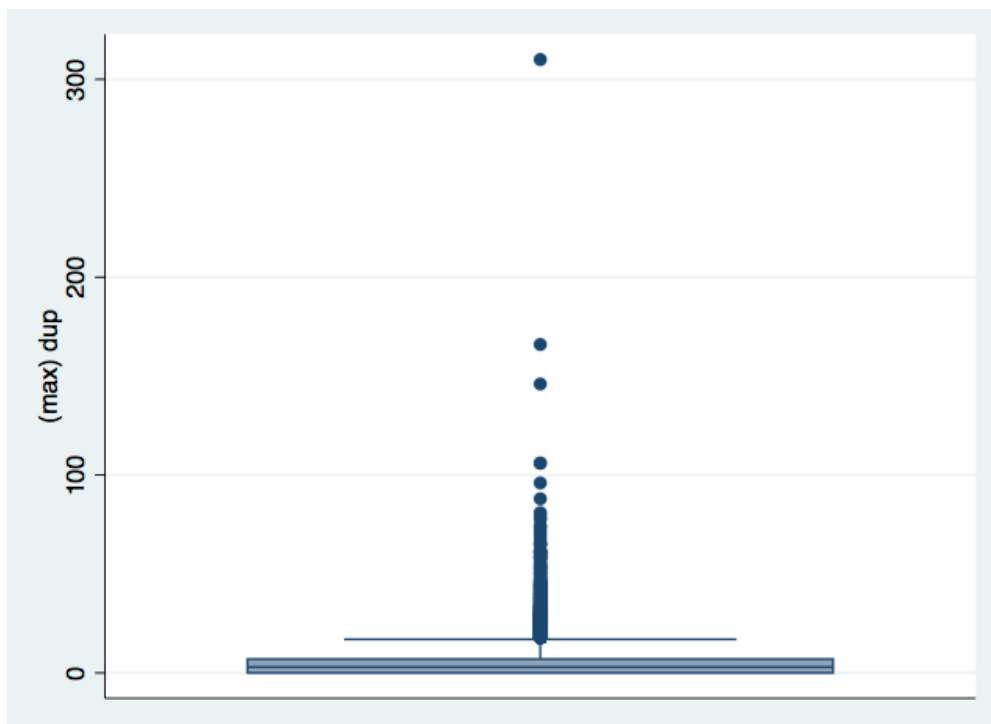
Figure 217. Violations box and whisker plot
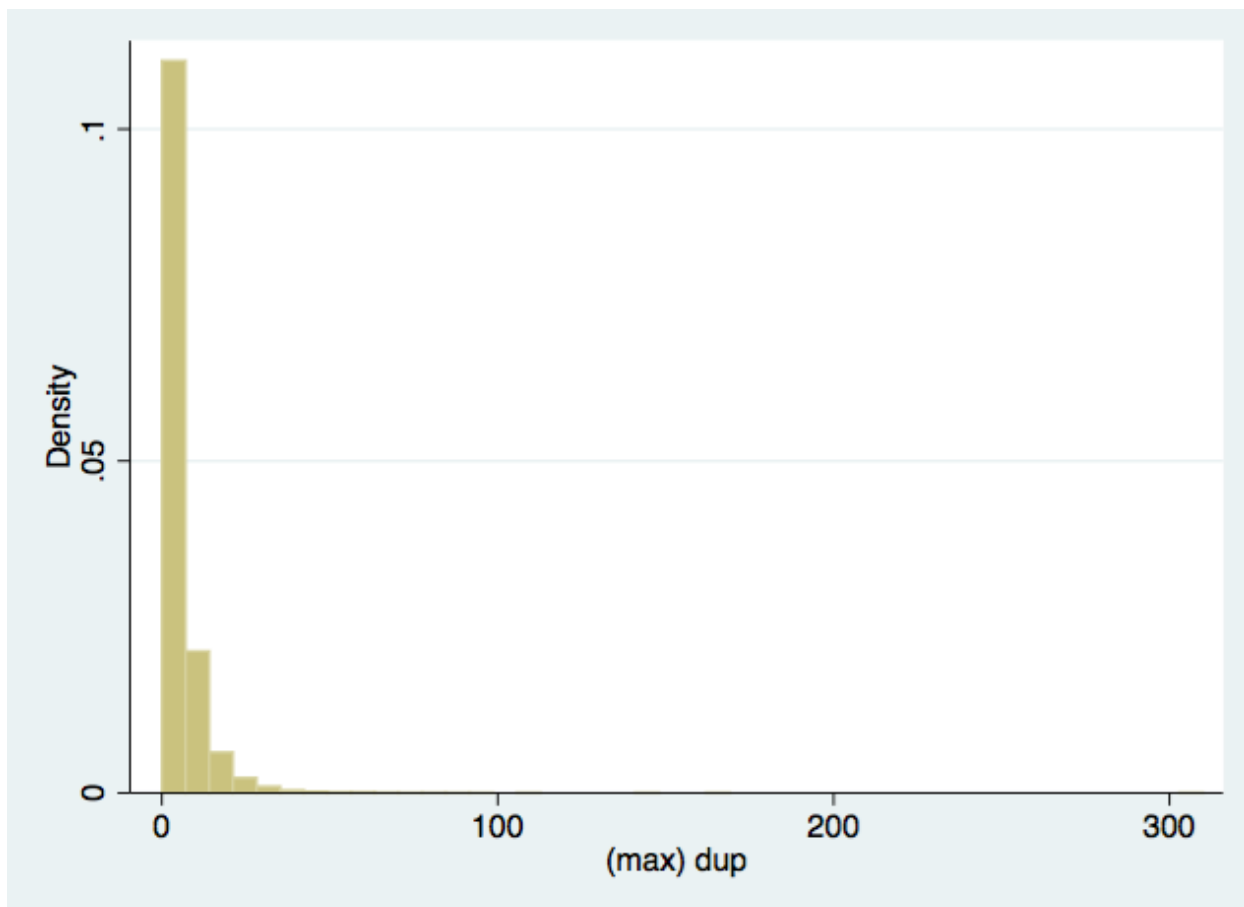
Figure 218. Number of violations for the early adult subsample.

PAPER 3

TRAUMATIC EXPERIENCES AMONG PROBATIONERS WITH SEVERE AND
PERSISTENT MENTAL ILLNESS
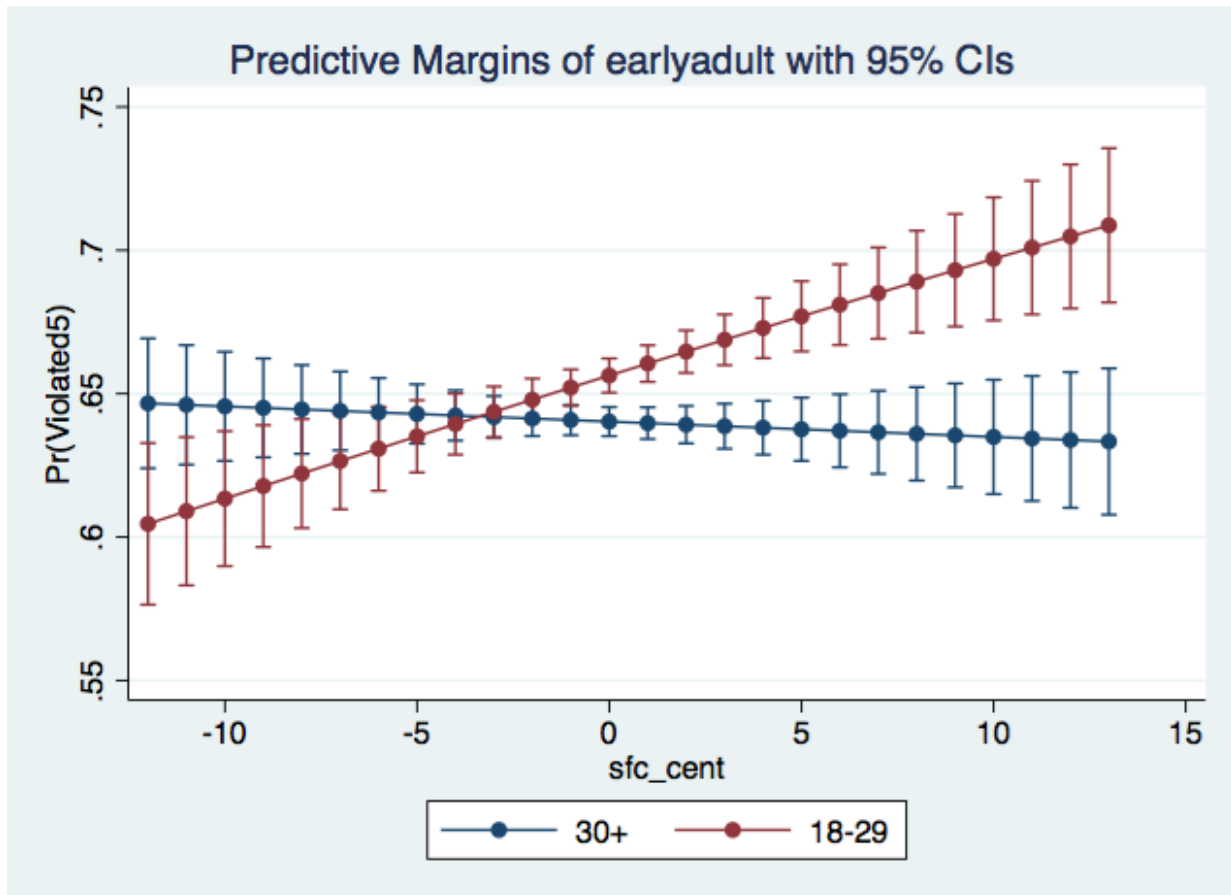
Abstract

Estimates suggest that as many as 1.8 million individuals on probation or parole
experience a mental illness. This high-need group is at risk for adverse outcomes above and
beyond their counterparts with no mental illnesses. Moreover, trauma is substantially higher
among justice-involved populations than the general public, however, estimates vary
considerably regarding the amount of trauma experienced by individuals with mental illnesses.
This exploratory, cross-sectional study identifies the types, and amount, of traumatic events
experienced by probationers with serious mental illnesses across one southeastern state. The Life
Events Checklist (LEC) is used to assess which events are experienced and identify cumulative
trauma among this sample. Findings reveal that 96% of the sample had experienced at least one
traumatic event, with 52% of the sample meeting criteria for PTSD diagnosis according to the
MINI version 4. Considering the high rates of traumatic experience among this sample, more
research is needed to understand the extent to which trauma impacts functioning within the
criminal justice system.

Introduction

The United States has the highest rate of criminal justice involvement in the world. Though the number of individuals under correctional supervision (i.e., jail, prison, probation, or parole) has decreased slightly over the past few years, numbers remain high at 1 in 36 adults under some type of correctional supervision. These estimates include the 459 out of 100,000 individuals incarcerated in jails or prisons (Bureau of Justice Statistics, 2018) and the 1 in 53 U.S. adults under community supervision (Kaeble & Bonczar, 2016). Community supervision (i.e., probation, parole, or post-release supervision) is used to provide alternatives to incarceration sentences or as a way to ensure public safety after release from prison (North Carolina Department of Public Safety [NC DPS], n.d.). In North Carolina these ratios are reflected in the roughly 85,000 adults on probation and the additional 12,000 serving post-release or parole sentences (NCDPS, 2018) out of the 10 million residents. In 2015, the number of individuals across the United States on probation dropped slightly from the previous year, however, the number of individuals exiting probation also decreased during the same time (Kaeble & Bonczar, 2016). The number of individuals under correctional supervision has remained relatively static over the last several decades providing researchers, practitioners, and policy makers an opportunity to implement practices to reduce the large societal burden correctional supervision represents (Travis, Western, & Redburn, 2014).

Early Adults in the Justice System

Early adults (individuals aged between 18 and 29 years) comprise a substantial portion of the criminal justice population. Over 40% of arrests each year, or 3.5 million, are of individuals in this age range (FBI, 2016). This rate is higher than any other age group: 30-39 year olds account for 23% of arrests, 40-49 year olds account for 14% of arrests, 50-59 year olds comprise

9% of arrests each year, and individuals 60 and older account for less than 3% of arrests made each year (FBI, 2016). Early adults make up even higher proportions of arrests for murder (55%), robbery (52%), and property crimes (42%; FBI, 2016). Furthermore, individuals under age 30 are more likely to commit subsequent crimes (Durose, Cooper, & Snyder, 2014). Although no information is publicly available on the specific rates of early adults on probation or parole, it is likely that similar proportions would be observed based on knowledge of criminal behavior during the transition between adolescence and adulthood. Although a portion of adolescents who continue offending behavior after 18 years old naturally discontinue these behaviors around 19-20, many others continue to engage in criminal behavior with some early adults beginning their criminal offending during this time frame (Loeber, Farrington, & Petechuk, 2013). Early adulthood is a pivotal developmental stage (both cognitively and socially) in which many life changes occur. Utilizing resources to address the specific needs and experiences of this age group has the potential to disrupt the trajectory of these individuals becoming perpetually involved in the justice system.

Mental illnesses and criminal justice involvement

The criminal justice system also manages many individuals with mental health needs. The extent to which mental illnesses are present among those involved in the criminal justice system depends on the measurement and type of mental illness reported. However, best estimates suggest that around 15% of men and 31% of females (i.e., approximately 119,000 people) in jail have mental illnesses (Steadman, Osher, Robbins, Case, & Samuels, 2009). Around 250,000 prison inmates (16% of males and 24% of females; Ditton, 1999) and about 1.82 million probationers (27%; Crilly et al., 2009) also have mental illnesses. These rates are typically higher than community samples. For example, Teplin (1990) found that the rate of mental illnesses for

jail inmates was 6.36% in contrast to the 1.84% found in the general population. Age group comparisons further highlight the discrepancies between community samples and correctional samples. The rates of mental illnesses for jail inmates compared to general populations are: 4.36% versus 1.94% for 18-22 year olds, 6.99% compared to 1.65% for 23-27 year olds, and for 28-32 year olds the rates are 10.8% versus 2.36% (Teplin, 1990).

Trauma among justice populations

The number of justice-involved individuals who have experienced a traumatic event or experience symptoms of previous trauma is high. The most comprehensive definition identifies trauma as experiencing, witnessing, or being threatened with serious injury, death, or bodily harm and responding with intense fear, hopelessness, or horror (Wallace, Conner, & Dass-Brailsford, 2011). Estimates of traumatic experiences among individuals involved with the criminal justice system vary considerably. Some estimates suggest as few as 4% of justice-involved populations have experienced a traumatic event (Goff, Rose, Rose, & Purves, 2007), whereas other estimates put the rate at as high as 79% of justice-involved populations (Haugebrook, Zgoba, Maschi, Morgen, & Brown, 2010). Despite the variability in estimates-there is no national prevalence estimate, there is consensus that justice-involved populations experience higher rates of trauma than general populations (Donley et al., 2012; Goff et al., 2007). Furthermore, justice-involved individuals who experience mental illnesses are also at higher odds of having experienced traumatic events in their past. In one study, up to 56% of offenders experienced mental illness and trauma (Kim, Park, & Kim, 2016), whereas other researchers have found that up to 68% of individuals experienced substance use and trauma (Brown et al., 2015). The inability to establish a clear estimate of traumatic exposure of individuals involved in the criminal justice system produces a strain on administrators' ability to

understand and address trauma within the criminal justice system.

One possible reason that estimates of trauma among justice-involved populations vary so broadly is the inconsistency in how trauma is defined and measured. A multitude of scales, indexes, and assessments have been developed to measure exposure and reactions to trauma and assess and diagnosis Posttraumatic Stress Disorder (PTSD) among those who have experienced trauma (SAMHSA, 2014). Moreover, these measurement tools capture varying constructs, timelines, and symptoms related to exposure to certain stressful life events. Individual tools may not adequately reflect the extent to which traumatic events have been experienced or the impact they have had on an individual. For example, one tool may measure only childhood abuse and neglect whereas another tool might record information about natural disasters and fires that an individual has experienced.

The Life Events Checklist (LEC) measures exposure (i.e., direct experiences, witness to the event, learning of the event happening to a friend or family member, or exposure as part of the duties of employment) to life stressor events over the lifetime (Gray, Litz, Hsu, & Lombardo, 2004), whereas the Clinician Administered PTSD Scale (CAPS) takes inventory of trauma symptoms in the last week as related to traumatic experiences, either recent or over the lifetime (Weathers et al., 2013). Some studies use a measurement tool that assesses diagnosis of PTSD, though others merely assess symptoms of or exposure to potentially traumatic events. Additionally, many of these measures are not validated with justice populations (SAMHSA, 2014). Variability in how PTSD, and trauma, is defined and what events are included in measures are ever-evolving creating a fluidity that increases the complexity of accurate assessment of the extent to which criminal justice-involved persons experience, and are impacted by, trauma in their lives.

Moreover, little research exists examining the effects of cumulative, or complex, trauma for individuals within the criminal justice system. Briere, Agee, and Dietrich (2016) found that PTSD rates were significantly higher for inmates (48%) than the general population (4%), as well as high rates of complex trauma (i.e., multiple traumatic events experienced and affecting functioning) among the incarcerated sample. Notably, Briere et al. (2016) did not specify mental health status other than diagnosis of PTSD. Considering the high proportion of individuals with mental illnesses in the criminal justice system, it is important for policy and practice purposes to understand the impact trauma has on behavior among justice-involved persons who have mental illnesses.

Links between trauma symptoms and criminogenic risk

Similar behaviors are both symptoms present after experiencing a traumatic event as well as antecedents to engaging in criminal behavior. According to trauma theory, the experience of traumatic events is associated with a lowered ability to regulate thinking and behavior (Bloom, 1999). Moreover, the occurrence of multiple traumatic live events, or cumulative trauma, has been associated with the development of mental health needs related to depression, dissociation, and PTSD (Martin, Cromer, DePrince, & Freyd, 2013). Once someone experiences a traumatic event, she or he is more likely to develop heightened irritability, exaggerated startle responses, aggression, impulsivity, and anxiety (Bloom, 1999). Other reactions to traumatic experiences include inability to concentrate, emotional numbing, violent reactions to everyday situations, impaired thinking, and negative thought patterns (Bloom, 1999; U.S. Department of Veterans Affairs, 2015).

Many of these responses to trauma, especially impulsivity and poor reasoning, are present when engaging in criminal acts (Bonta & Andrews, 2007). According to the Risk Need

Responsivity (RNR) framework of criminal behavior, impulsivity, adventure seeking, and aggression are strongly associated with criminal behavior and key components of the criminogenic risk factors closely associated with offending behavior (Bonta & Andrews, 2007). The parallels between symptoms of traumatic experiences and precursors to criminal behavior are important to understanding the effect trauma-informed programming could have on individuals involved in the criminal justice system. Especially among early adults who, due to unfinished brain development, have lower reasoning skills, higher impulsive tendencies, and poorer judgement than older adults generally (Arnett, 2007).

Although prevalence estimates of trauma among justice-involved populations exists, little is known about the rates of traumatic experiences and symptoms among early adults, especially early adults with mental health needs. Considering the connection between traumatic symptoms and precursors to criminal behaviors, it is especially important to understand the extent of trauma among justice-involved populations, particularly those with mental health needs. The conflated effects of traumatic experience and mental health symptoms could be particularly problematic for probation officers and others trying to serve this high-risk, high-need population.

Current Study

Addressing trauma among justice-involved populations could assist in creating effective programming and justice practices that will reduce the number of individuals engaging in criminal acts due to symptoms of undiagnosed and untreated trauma, subsequently leading to decreased numbers of individuals under correctional supervision. The current study aims to fill the gaps in knowledge about prevalence of trauma among justice-involved populations, specifically regarding probationers with serious mental illnesses. The aims of the study are: (1) to identify the level of trauma experienced among individuals with serious mental illness who are

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on probation, (2) to identify how traumatic experiences differ for early adults compared to older adult probationers, and (3) to identify if traumatic experiences differ by gender, probation experience, and mental health status.

Methods

Design and Sample

A cross-sectional exploratory study was conducted using data from a larger, randomized controlled trial (RCT) of specialty mental health probation. Self-report data about trauma and other behavioral health indicators were collected from probationers with severe mental illnesses in six counties from one southeastern state to assess cumulative trauma among a high-risk, high-need population. Data include measures of mental health functioning, social support, relationship with probation officer, exposure to trauma, and social service utilization. Data in this study focused on traumatic experiences and criminal justice histories of the probationers in the sample.

Individuals on probation in any of the six study counties who screened positive on the state's brief mental health screen (i.e., answered affirmatively to one or more of the following: I hear or see things that other people say they don't hear or see, I believe that other people can control my mind by putting thoughts into my head or taking thoughts out of my head, I have so much energy that I can go for days without sleep and thoughts just race through my head, or I feel so bad that I think of taking my own life; North Carolina Division of Community Corrections, 2011) were eligible to be interviewed for the RCT study of specialty mental health probation. Research staff coordinated meetings with potentially eligible probationers through probation officers. Study interviews were conducted in private settings during which individuals were informed about the study and were invited to participate in eligibility screening. All individuals were informed that the study was completely voluntary and confidential and were

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assured they could quit at any time without negative consequences.

Eligibility criteria for the study included: (1) between the ages of 18 and 99; (b) on probation in one of the six study counties; (3) recently on probation (no more than six months into their probation sentence); (4) competent to provide informed consent (assessed with a brief study-competency quiz); (5) identified as high-risk for reoffending as established by DPS supervision levels; and (6) met criteria for one of the following for Mini-International Neuropsychiatric Interview (MINI; Sheehan et al., 1998) diagnostic assessment modules: depressive episode, manic or hypomanic episode, mood disorder with psychotic features, psychotic disorder, or PTSD.

Following eligibility confirmation and consent, participants completed a 45-60 minute research interview during which demographic and clinical information was obtained and data were collected using a variety of standardized measures. Participants received a $15 gift card to a local vendor for completing the interview. All participants received a study fact sheet and copies of the consent materials, with contact information for the Principal Investigator and Institutional Review Board (IRB). Data were collected between January 2017 and December 2017.

Sample

The sample consisted of adult probationers with at least six months remaining on their probation sentences (see Table 3.1). At the time of analyses, 127 probationers were enrolled into the RCT. This included 73 males (57%) and 54 females (42%). Participants ranged from 18-66 with an average age of 32.39 (SD=10.73). Participants were predominately African American (54%, n=69) or Caucasian (39%, n=50). Less than 10% of the sample self-identified as Hispanic (6%, n=8).

One-third of the sample reported having a high school diploma or GED as their highest

level of education (30%, n=39), thirty-four participants had completed some college (27%), and thirty-six reported middle school or junior high as their highest educational level (28%). Two-thirds of the sample self-reported as never married (65%, n=83) and 56% of the sample currently had insurance (n=72). Just over half the sample reported they had been on probation previously (52%, n=67).

Mania (83%, n=105) and depressive episode (74%, n=94) were the two most common MINI modules in which participants met criteria (i.e., participants coded positively to meeting the criteria for the mental illness assessed by that module). Thirty-three participants (26%) met criteria for a psychotic disorder and 67 (53%) met criteria for PTSD. Twenty-four participants (20%) met criteria for only one of the four modules, 44 (35%) met criteria for two of the MINI modules, 42 (33%) met three MINI modules' criteria, and fifteen participants (12%) met criteria for all four screening modules from the MINI (i.e., depressive episode, manic or hypomanic episode, psychotic disorder, or PTSD).

Measures

SCL-R. A ten-item version of the symptom checklist (SCL-90) was used to briefly assess distress symptoms in the previous month. The SCL-R is used to identify distressing symptoms related to depression, anxiety, interpersonal sensitivity, obsessive compulsive tendencies, somatic concerns, avoidance, hostility, and paranoia (Rosen et al., 2000). The ten-item scale is measured on a Likert scale in which respondents report if the item has been distressing "not at all," "a little bit," "moderately," "quite a bit," or "extremely." Some items include: "feeling blue," "your feelings being easily hurt," and "feeling tense or keyed up." The scales have demonstrated acceptable reliability ($\alpha > .80$) as well as convergent validity (Rosen et al., 2000)

FSSQ. The Functional Social Support Questionnaire (FSSQ) is an eight-item assessment

of social support of the participant (Broadhead, Gehlbach, DeGruy, & Kaplan, 1988). The questions assess the amount of social support the participant perceives in relation to items such as: "I have people who care about what happens to me," "I get chances to talk about money matters," and "I get invitations to go out and do things with other people." The items are scored on a five-point Likert scale identifying if the event occurs "as much as I would like" to "much less than I would like." Items are summed to create an overall social support score. The FSSQ has previously been tested for reliability (test-test α=.66 and inter-item correlations .50 to .85) as well as validity (construct and concurrent validity established; Broadhead et al., 1988).

Service utilization. Participants were asked to identify services they have needed access to over the prior six months. Eighteen services are included in the index. Services include: "medical care," "medication for emotional problems," "outpatient drug treatment," and "crisis assistance," among others. If a participant endorsed a service they needed, they are then asked to report if they received the service and then if they had any issues receiving the service.

DRRI-R. The Dual Role Relationship Inventory-Revised (DRRI-R) is a 30-item questionnaire exploring the working relationship between a probationer and their supervising officer (Skeem, Louden, Polaschek, & Camp, 2007). Participants are asked a series of questions such as: "My officer cares about me as a person" and "My officer is enthusiastic and optimistic with me" to assess how the probationer feels about and interacts with their probation officer. The scale is scored on a seven-point Likert response structure with responses ranging from "never" to "always." Previous research has identified acceptable reliability (internal consistency: α=.87 to α=.96) and has established convergent validity (Skeem et al., 2007).

Social network analysis. Participants report on the agencies and organizations in which they engage service or support as well as individuals they identify as part of their social circle.

They are then asked to identify the amount of time spent engaging with these organizations or individuals, the degree to which they trust the organizations and individuals, as well as other questions. Participants also report the probation officers contact with the individuals and how much support they receive from the agencies and the individuals.

Life Events Checklist

The Life Events Checklist (LEC) is a 17-item index of traumatic event experiences over the course of the lifetime. Participants respond to each item and identify if they have: (1) directly experienced the event, (2) witnessed the event happen to someone else, (3) learned about the event happening to a close friend or family member, or (4) been exposed to the event as part of their job. Items include events such as natural disasters, assault (physical and sexual), exposure to toxic substances, combat experience, and severe human suffering, among others. The index was scored to create a marker of cumulative trauma, measured as the number of events a participant has directly experienced. Additionally, indexes were created for witnessing events, learning about events, and exposure as part of job. Each index was tested for reliability and demonstrated adequate reliability to be used as an index. The index for exposure as part of the job demonstrated the strongest reliability (α=.94), followed by learning about traumatic events (α=.89), then witnessing the events (α=.78), and lastly direct experience of the event (α=.72).

Lastly, 14 of the life stressor events were categorized into interpersonal trauma or non-interpersonal trauma. Due to the nature of the questions regarding sudden violent or accidental death, which participants should not have endorsed as personally happened to them, and other stressful or traumatic events, of which it is impossible to discern type of trauma, these three items were not included in analyses related to interpersonal and non-interpersonal trauma. Mirroring previous research methods, five events were considered non-interpersonal: natural

disaster, fire or explosion, transportation accident, serious accident at work or home, and exposure to toxic substances (Briere et al., 2016). The other nine items (e.g., sexual assault, combat, captivity, etc.) were considered threats or injury to self and were therefore classified as interpersonal trauma.

The items on the LEC are as follows: (1) Natural disaster; (2) Fire or explosion; (3) Transportation accident; (4) Serious accident at work, home, or during recreational activity; (5) Exposure to a toxic substance; (6) Physical assault; (7) Assault with a weapon; (8) Sexual assault; (9) Other unwanted or uncomfortable sexual experience; (10) Combat or exposure to a war-zone; (11) Captivity; (12) Life-threatening illness or injury; (13) Severe human suffering; (14) Sudden violent death; (15) Sudden accidental death; (16) Serious injury, harm, or death you caused to someone else; and (17) Any other very stressful even or experience.

Data Analysis

Due to the exploratory nature of this study, descriptive and bivariate analyses are used to identify patterns among the data. Descriptive analyses describe the sample and the basic experiences of trauma among the sample. Bivariate analyses include t-tests and chi-square tests to establish patterns of difference among subgroups of the sample. Two-tailed tests were conducted with alpha set at .05. All analyses were conducted using Stata 14 (StataCorp, 2015). The distributions of continuously measured variables were checked for normality and the assumptions of all bivariate tests (i.e., chi square, independent groups t-test) were assessed.

Results

Traumatic experiences

Only five participants (4%) reported no direct experience of any of the traumatic events included in the LEC at the time of data collection. This left 96% of the sample reporting direct

exposure to at least one of the 17 stressful life events. The average number of events experienced was 5.4 (SD=3.0, range 0-17). The breakdown of number of traumatic events experienced is as follows: zero events (4%, n=5), one event (6%, n=8), two events (9%, n=11), three events (8%, n=10), four events (9%, n=11), five events (15%, n=19), six events (13%, n=17), seven events (13%, n=17), eight events (9%, n=11), nine events (8%, n=10), ten events (5%, n=6), fifteen events (1%, n=1), seventeen events (1%, n=1). No participants identified experiencing 11-14, or 16, events. Table 3.2 provides detailed information on the number of participants who experienced each event.

Individual life stressor events

For the entire sample the top five experienced events were transportation accident (77%, n=98), physical assault (76%, n=97), assault with a weapon (61%, n=78), sexual assault (47%, n=60), and other unwanted or uncomfortable sexual experience (39%, n=50). Fifty participants had also experienced a stressful event not listed on the LEC (39%). Approximately one-third of the sample experienced each: a serious accident at work, home, or during recreational activity (35%, n=44); a life-threatening illness or injury (34%, n=43); and a natural disaster (33%, n=42). Less than one-fourth of the sample experienced the remaining events. Twenty-nine participants (23%) reported experiencing serious injury harm or death that they had caused to someone else. Twenty-five participants (20%) reported experiences of fire or explosion, 20 (16%) reported severe human suffering, and 18 (14%) reported experiences of captivity. Less than ten percent of the sample experienced: combat or exposure to a war zone (9%, n=11), exposure to toxic substance (8%, n=20), sudden violent death (7%, n=9), or sudden accidental death (5%, n=6).

Age group comparisons. The probationers in the older age range (i.e., 30-66 years of age) followed the same pattern of the top five events experienced as the overall sample. Fifty-

two (78%) of the older adult probationers experienced a transportation accident, 51 (76%) directly experienced physical assault, 44 (66%) had experienced assault with a weapon, 36 (54%) participants in this age group experienced sexual assault, and 29 (43%) had experienced other unwanted or uncomfortable sexual experience in their lifetime. Twenty-seven (40%) older adults experienced life-threatening illness or injury and 25 (37%) experienced other stressful life events not specified in the LEC. Approximately one-third of the older adults experienced both a serious accident at work, home, or during recreational activity (35%, n=24) or a natural disaster (33%, n=22). Fifteen (22%) older adults reported serious injury, harm, or death they had caused to someone else. Just under one-fifth of the sample had experienced: a fire or explosion (19%, n=13), severe human suffering (19%, n=13), or captivity (16%, n=11). Nine participants reported exposure to a toxic substance (13%), eight (12%) reported combat or exposure to a war zone, three (4%) reported sudden violent death, and two (3%) reported sudden accidental death.

For the early adult probationer group the highest endorsed traumatic experience was a tie between a transportation accident (77%, n=46) or physical assault (77%, n=46). Thirty-four participants experienced assault with a weapon (57%). Some other traumatic experience not covered in the LEC was the fourth highest traumatic experience for early adults (42%, n=25), followed by sexual assault (40%, n=24). Twenty-one (35%) early adult probationers reported other unwanted or uncomfortable sexual experiences. Twenty (33%) early adults reported being involved in a serious accident at work, home, or during recreational activity, as well as experiencing a natural disaster (33%, n=20). Around one-fourth of the early adult sample experienced: life-threatening illness or injury (27%, n=16); causing serious injury, harm, or death to someone else (23%, n=14); or a fire or explosion (20%, n=12). Seven (12%) early adults reported each direct experience of severe human suffering and captivity. Six (10%) early adults

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reported sudden violent death, four (7%) reported sudden accidental death, three (5%) reported combat or exposure to a war zone, and one (2%) reported exposure to a toxic substance.

No statistically significant differences existed between experiences of individual LEC items for the two groups with the exception of exposure to toxic substances, in which older adults were more likely to have been exposed to toxic substances than early adults (x^2=6.04, p<.05).

Gender comparisons. The LEC events were also analyzed individually for males versus females in the sample (see Table 3.3). The five most highly endorsed traumatic events for females included: transportation accident (78%, n=42), physical assault (78%, n=42), sexual assault (76%, n=41), other unwanted or uncomfortable sexual experience (63%, n=34), and assault with a weapon (57%, n=31). A sizeable portion of the female probationers also experienced a stressful life event not identified on the LEC (39%, n=21); a natural disaster (33%, n=18); a life-threatening illness or injury (28%, n=15); a serious accident at work, home, or during recreational activity (24%, n=13); and captivity (22%, n=12). Less than one-fifth of the female sample reported: serious injury or harm they had caused to someone else (17%, n=9), severe human suffering (15%, n=8), sudden violent death (13%, n=7), and fire or explosion (11%, n=6). Five (9%) female probationers reported sudden accidental death, three (6%) reported exposure to a toxic substance, and two (4%) experienced combat or exposure to a war zone.

The most highly endorsed LEC items for male probationers were: transportation accident (77%, n=56); physical assault (75%, n=55); assault with a weapon (64%, n=47); a serious accident at work, home, or during recreational activity (42%, n=31); and some other life event not specified on the LEC (40%, n=29). Between one-fourth and one-half of the male sample

reported life-threatening illness or injury (38%, n=28), natural disaster (33%, n=24), causing serious injury or harm to someone else (27%, n=20), sexual assault (26%, n=19), and fire or explosion (26%, n=19). Sixteen (22%) male probationers reported other unwanted or uncomfortable sexual experience and twelve (16%) reported experiencing severe human suffering. Fewer than ten male participants reported combat or exposure to a war zone (12%, n=9), exposure to a toxic substance (10%, n=7), captivity (8%, n=6), sudden violent death (3%, n=2), and sudden accidental death (1%, n=1).

A statistically significantly higher proportion of female probationers than male probationers reported experiencing: sexual assault (76% female vs. 26% male, $p<.005$, $x^2(1)=31.01$), other unwanted or uncomfortable sexual experiences (63% vs. 22%, $p<.001$, $x^2(1)=21.91$), captivity or being held hostage (22% vs. 8%, $p<.05$, $x^2(1)=5.00$), sudden violent death (13% vs. 3%, $p<.05$, $x^2(1)=4.93$) and sudden accidental death (9% vs. 1%, $p<.05$, $x^2(1)=4.29$). However, a significantly higher proportion of male probationers reported experiences of fire or explosion events (26% vs. 11%, $p<.05$, $x^2(1)=4.37$) and serious accidents at work, home, or during recreational activity (42% vs. 24%, $p<.05$, $x^2(1)=4.64$).

LEC subscales

Age, gender, and probation comparisons. In the bivariate analyses for LEC subscales, only one statistically significant difference emerged for age grouping (see Table 3.4). Older adults (m=1.3) experienced statistically significantly more traumatic events as part of their job than early adult probationers (m=0.3, t(65)=1.82, $d=.40$, $p<.05$). No statistically significant differences emerged for male versus female probationers for the LEC trauma indexes. Probationers who had a previous probation sentence experienced significantly more traumatic experiences than probationers with no previous sentence (5.9 vs. 4.9, t(125)=-1.93, $d=.34$,

p=.05). For the type of trauma subscales (i.e., interpersonal vs. non-interpersonal), females reported statistically significantly higher rates of interpersonal trauma events than male probationers (3.6 vs. 2.9, t(125)=-1.95, *d*=.48, *p*=.05).

Mental illness comparisons. Additionally, analyses explored traumatic event experiences by mental health criteria met (see Table 3.5). Participants who met the criteria for a psychotic disorder experienced no statistically significant differences in trauma exposure than participants who did not meet this module's criteria. For the participants who met criteria for experiencing a manic episode, they experienced more traumatic events directly than probationers who did not meet criteria for this module (5.7 vs. 4.0, t(125)=-2.5, *d*=.59, *p*<.01). Lastly, only one significant difference emerged for participants who met criteria for a depressive episode. Individuals who did not meet criteria for a depressive episode witnessed significantly more traumatic events than participants who did meet the criteria for this MINI module (7.0 vs. 4.8, t(125)=2.12, *d*=.63, *p*<.01).

PTSD diagnosis

Sixty-seven participants (53%) met criteria for a PTSD diagnosis according to the MINI version 4 PTSD module. Further analyses explored the differences between participants with a PTSD diagnosis versus those participants who did not meet the criteria for this module (see Table 3.6). Five life events were statistically significantly different for individuals with PTSD versus those who did not have PTSD. First, a higher proportion of individuals with a PTSD diagnosis experienced assault with a weapon than those without a PTSD diagnosis (72% vs. 50%, x^2(1)=6.26, *p*<.01). Additionally, participants with a PTSD diagnosis experienced sexual assault (60% vs. 33%, x^2(1)=8.83, *p*<.01) and other unwanted or uncomfortable experiences (55% vs. 22%, x^2(1)=14.93, *p*<.001) at higher rates than participants who did not meet the PTSD

criteria. Next, a significantly larger proportion of individuals with PTSD experienced severe human suffering than those without PTSD (22% vs. 8%, $x^2(1)=4.71$, $p<.05$). Lastly, there was a significant difference in experiences of captivity for participants who met PTSD criteria vs. those who did not (21% vs. 7%, $x^2(1)=5.27$, $p<.05$).

Discussion

This study used a sample of probationers in six counties across one southeastern state to explore the experiences of traumatic events as well as cumulative trauma among a high-risk, high-need sample. Trauma among justice-involved populations is consistently higher than general populations (Donley et al., 2012; Goff et al., 2007), however, little is known about the experiences of trauma among justice-involved populations with mental illnesses. This study provides insight into the prevalence of trauma among such a vulnerable population.

A significant proportion of the sample (96%) experienced at least one stressful life event during their lifetime, and just over half met criteria for a diagnosis of PTSD. The experience of traumatic events among this sample (96%) is significantly higher than an estimate from a nationally representative sample, in which 89% of the sample experienced any event identified by the DSM-5 as potentially traumatic (Kilpatrick et al., 2013). Such a high rate of traumatic experience among probationers with serious mental illnesses indicates a need for trauma-informed training for criminal justice staff and administrators in order to understand the link between traumatic experience and treatment for criminogenic behavior. As noted previously, experiences of trauma often exacerbate behaviors that are linked to criminal behavior such as impulsivity, poor reasoning, substance use, poor judgement, and impaired thinking (Bloom, 1999).

The highest endorsed traumatic experiences of the sample were violent experiences (i.e., assault and traffic accidents). As noted earlier, PTSD was strongly correlated with experiencing the most violent interpersonal events. The events associated with PTSD diagnosis imply there may be specific events that are likely to result in PTSD and other events may merely be extremely stressful, but not reach the threshold of traumatic. If this is the case, practitioners and researchers must consider the types of events included in assessment tools whenever attempting to measure the extent to which trauma permeates the criminal justice system. Considering that a high proportion of the sample has experienced the events closely associated with PTSD, the findings support the need for trauma-informed programming for justice-involved individuals in order to address one of the core causes related to impulsive behavior and poor judgement. Undiagnosed and untreated trauma has the potential to exacerbate behaviors that can lead to continued justice involvement.

More concerning is the high levels of trauma experienced by early adults in the sample. Early adult probationers experienced the same level of trauma as older adult probationers, even though they have had a shorter time frame in which to experience trauma. The significant amount of trauma experienced by early adults further highlights the need for the criminal justice system to react to trauma among its population. Clearly, trauma is occurring early and often for justice-involved individuals. Moreover, repeat probation sentences were associated with higher levels of trauma. Although a timeline of traumatic events cannot be determined, probationers who had experienced justice involvement previously experienced more life stressor events than those participants on probation for the first time. This finding supports the notion that justice involvement can be worsened, or at least continued, whenever trauma is left untreated. Additionally, the type of trauma (i.e., interpersonal versus non-interpersonal) is relevant for

female probationers, repeat probationers, and individuals who met MINI criteria for a manic episode. Interpersonal trauma was significantly higher for these groups of individuals than their counterparts. Again, supporting the need for targeted trauma-informed treatment for those individuals who have experienced traumatic events.

Limitations

As with any research, limitations of the data should be noted. The data are from six counties in one state, thus significantly limiting the generalizability of the findings. Though findings mirror trends from other research, caution should be used when applying the findings to other samples. Furthermore, the relatively small sample size limits analytical methods and statistical analyses. The findings from this study are very preliminary and exploratory. As such, findings are not meant to be the authority on trauma among probationers with serious mental illnesses. Rather, findings are a foundation in which to build upon to better understand how traumatic experiences impact the individuals under correctional supervision.

Conclusion

The significant portion of the sample who experienced many types of trauma is concerning. Moreover, they are experiencing severe, violent types of trauma. It is worth exploring how these events are impacting daily functioning, social interactions, and prosocial behaviors. Mental health needs are potentially compounded by the traumatic experiences, both before and after justice contact, and exacerbate the inability to disengage from the criminal justice system. Rehabilitative practices with justice populations should include components of mental health treatment as well as programming for overcoming trauma when possible.

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Table 23.1 *Sample characteristics (N=127).*

	n (%)	M(SD); range	YA	OA	*p*
Gender					0.587
Male	73 (57.48)		36 (60.0)	37 (55.22)	
Female	54 (42.52)		24 (40.0)	30 (44.78)	
Early adult (18-29)	60 (47.24)				
Older adult (30+)	67 (52.34)				
Age		32.13 (11.06); 18-66	23.28 (3.49)	40.45 (8.31)	<.001
Race					
White	50 (39.06)		15 (25.42)	35 (52.24)	0.028
African American	69 (53.91)		39 (66.10)	30 (44.78)	
American Indian	1 (0.78)		1 (1.69)	0	
Asian	1 (0.78)		1 (1.69)	0	
Other	5 (3.91)		3 (5.08)	2 (2.99)	
Hispanic	8 (6.25)		6 (10.0)	2 (2.99)	0.104
Highest education					
Middle school or Junior	36 (28.12)		21 (35.0)	15 (22.39)	0.115
HS	39 (30.47)		21 (35.0)	18 (26.87)	
HS diploma or GED	34 (26.56)		14 (23.33)	20 (29.85)	
Some college	13 (10.16)		4 (6.67)	9 (13.43)	
Associates/Tech degree	4 (3.12)		0	4 (5.97)	
Bachelors					
Employment					
Unemployed	42 (32.81)		22 (36.67)	20 (29.85)	0.006
Part-time	32 (25.00)		20 (33.33)	12 (17.91)	
Full-time	39 (30.47)		16 (26.67)	23 (34.33)	
Disabled/unable to	11 (8.59)		0	11 (16.42)	
work	3 (2.34)		2 (3.33)	1 (1.49)	
Student					
Insurance					
Yes	72 (56.25)		38 (64.41)	34 (51.52)	0.145
No	53 (41.41)		21 (35.59)	32 (48.48)	
Marital status					
Never married	83 (64.84)		55 (91.67)	28 (41.79)	<.001
Separated	11 (8.59)		3 (5.0)	8 (11.94)	
Divorced	20 (15.62)		1 (1.67)	19 (28.36)	
Married	11 (8.59)		1 (1.67)	10 (14.93)	
Widowed	2 (1.56)		0	2 (2.99)	
Previous probation sentence	67 (52.34)		25 (41.67)	42 (62.69)	
Yes	60 (46.88)		35 (58.33)	25 (37.31)	0.018
No					

Table 3.24. *Frequency of experiences of each traumatic life event by age group.*

Life Event	Total Sample N=127 n (%)	Early Adults N=60 n (%)	Older Adults N=67 n (%)
Transportation accident	98 (77.17)	46 (76.67)	52 (77.61)
Physical assault	97 (76.38)	46 (76.67)	51 (76.12)
Assault with a weapon	78 (61.42)	34 (56.67)	44 (65.67)
Sexual assault	60 (47.24)	24 (40.00)	36 (53.73)
Other unwanted or uncomfortable sexual experience	50 (39.37)	21 (35.00)	29 (43.28)
Any other very stressful event or experience	50 (39.37)	25 (41.67)	25 (37.31)
Serious accident at work, home or during recreational activity	44 (34.65)	20 (33.33)	24 (35.82)
Life-threatening illness or injury	43 (33.86)	16 (26.67)	27 (40.30)
Natural disaster	42 (33.07)	20 (33.33)	22 (32.84)
Serious injury, harm or death you caused someone else	29 (22.83)	14 (23.22)	15 (22.39)
Fire or explosion	25 (19.69)	12 (20.00)	13 (19.40)
Severe human suffering	20 (15.75)	7 (11.67)	13 (19.40)
Captivity	18 (14.17)	7 (11.67)	11 (16.42)
Combat or exposure to a war zone	11 (8.66)	3 (5.00)	8 (11.94)
Exposure to toxic substance	10 (7.87)	1 (1.67)	9 (13.43)*
Sudden violent death	09 (7.09)	6 (10.00)	3 (4.48)
Sudden accidental death	06 (4.72)	4 (6.67)	2 (2.99)

*$p<.05$

Table **Error! Bookmark not defined.** *Frequency of experiences of each traumatic life event by gender.*

Life Event	Total Sample N=127 n (%)	Male N=73 n (%)	Female N=54 n (%)
Transportation accident	98 (77.17)	56 (76.71)	42 (77.78)
Physical assault	97 (76.38)	55 (75.34)	42 (77.78)
Assault with a weapon	78 (61.42)	47 (64.38)	31 (57.41)
Sexual assault	60 (47.24)	19 (26.03)	41 (75.93)***
Other unwanted or uncomfortable sexual experience	50 (39.37)	16 (21.92)	34 (62.96)***
Any other very stressful event or experience	50 (39.37)	29 (39.73)	21 (38.89)
Serious accident at work, home or during recreational activity	44 (34.65)	31 (42.47)	13 (24.07)*
Life-threatening illness or injury	43 (33.86)	28 (38.36)	15 (27.78)
Natural disaster	42 (33.07)	24 (32.88)	18 (33.33)
Serious injury, harm or death you caused someone else	29 (22.83)	20 (27.40)	9 (16.67)
Fire or explosion	25 (19.69)	19 (26.03)	6 (11.11)*
Severe human suffering	20 (15.75)	12 (16.44)	8 (14.81)
Captivity	18 (14.17)	6 (8.22)	12 (22.22)*
Combat or exposure to a war zone	11 (8.66)	9 (12.33)	2 (3.70)
Exposure to toxic substance	10 (7.87)	7 (9.59)	3 (5.56)
Sudden violent death	09 (7.09)	2 (2.74)	7 (12.96)*
Sudden accidental death	06 (4.72)	1 (1.37)	5 (9.26)*

*$p<.05$, ***$p<.001$

Table **Error! Bookmark not defined.** *LEC scale differences for subgroups of probationers.*

	Age grouping			Gender			Previous probation sentence		
	Early Adult N=60 M(SD)	**Older Adult N=67 M(SD)**	***p, d***	**Male N=73 M(SD)**	**Female N=54 M(SD)**	***p, d***	**Yes N=67 M(SD)**	**No N=67 M(SD)**	***p, d***
Happened to me	5.1 (2.8)	5.7 (3.1)	.23	5.2 (3.1)	5.7 (2.9)	.35	5.9 (2.9)	4.9 (2.9)	**.05, .35**
Witnessed the event	5.7 (3.4)	5.0 (3.8)	.28	5.8 (3.8)	4.9 (3.3)	.12	5.5 (3.9)	5.2 (3.3)	.69
Learned about the event	6.3 (4.8)	5.4 (4.6)	.28	6.1 (4.9)	5.4 (4.4)	.41	5.7 (4.8)	6.0 (4.6)	.67
Part of job	0.3 (0.8)	1.3 (3.2)	**.03, .40**	1.1 (3.1)	0.4 (1.1)	.10	0.6 (2.2)	1.0 (2.7)	.35
Interpersonal trauma	2.9 (1.8)	3.5 (2.1)	.08	2.9 (1.9)	3.6 (2.0)	**.05, .35**	3.6 (2.0)	2.7 (1.9)	**.01, 47**
Non-interpersonal trauma	1.7 (1.0)	1.8 (1.2)	.49	1.9 (1.3)	1.5 (0.9)	.08	1.7 (1.1)	1.7 (1.2)	.94

Table **Error! Bookmark not defined.** *LEC scale differences by MINI criteria.*

	Manic episode criteria met			Depressive episode criteria met			Psychotic disorder criteria met		
	Yes N=105 M(SD)	**No** N=22 M(SD)	**p, d**	**Yes** N=94 M(SD)	**No** N=33 M(SD)	**p, d**	**Yes** N=33 M(SD)	**No** N=94 M(SD)	**p**
Happened to me	5.7 (3.0)	4.0 (2.7)	**.01,** **.59**	5.6 (3.1)	5.1 (2.5)	.45	5.7 (3.0)	5.3 (3.0)	.51
Witnessed the event	5.6 (3.7)	4.5 (3.2)	.22	4.8 (3.5)	7.0 (3.4)	**.002,** **.63**	5.7 (3.3)	5.2 (3.7)	.51
Learned about the event	6.0 (4.9)	5.0 (3.7)	.35	5.6 (4.7)	6.4 (4.7)	.43	6.6 (4.0)	5.6 (4.9)	.30
Part of job	0.9 (2.7)	0.3 (0.6)	.31	0.7 (2.3)	1.1 (2.7)	.48	1.0 (2.7)	0.7 (2.4)	.65
Interpersonal trauma	3.4 (2.0)	2.3 (1.9)	**.02,** **.57**	3.2 (2.0)	3.0 (1.9)	.51	3.3 (1.9)	3.1 (2.0)	.65
Non-interpersonal trauma	1.8 (1.2)	1.4 (1.0)	.15	1.7 (1.2)	1.8 (1.0)	.85	1.9 (1.2)	1.7 (1.1)	.28

Table **Error! Bookmark not defined.** *Frequency of traumatic life events based on PTSD diagnosis.*

Life Event	PTSD N=67 n (%)	No PTSD N=60 n (%)	*p*
Transportation accident	56 (83.58)	42 (70.00)	0.07
Physical assault	55 (82.09)	42 (70.00)	0.11
Assault with a weapon	48 (71.64)	30 (50.00)	0.01
Sexual assault	40 (59.70)	20 (33.33)	<.01
Other unwanted or uncomfortable sexual experience	37 (55.22)	13 (21.67)	<.001
Any other very stressful event or experience	27 (40.30)	23 (38.33)	0.82
Serious accident at work, home or during recreational activity	25 (37.31)	19 (31.67)	0.50
Natural disaster	25 (37.31)	17 (28.33)	0.28
Life-threatening illness or injury	22 (32.84)	21 (35.00)	0.80
Serious injury, harm or death you caused someone else	16 (23.88)	13 (21.67)	0.77
Fire or explosion	15 (22.39)	10 (16.67)	0.42
Severe human suffering	15 (22.39)	5 (8.33)	0.03
Captivity	14 (20.90)	4 (6.67)	0.02
Combat or exposure to a war zone	7 (10.45)	4 (6.67)	0.45
Exposure to toxic substance	7 (10.45)	3 (5.00)	0.26
Sudden violent death	6 (8.96)	3 (5.00)	0.39
Sudden accidental death	3 (4.72)	3 (5.00)	0.89

CONCLUSION

Summary of the Studies

The focus of the papers in this dissertation is to bring to light criminogenic risks and needs, as well as experiences of trauma, among early adults involved in the criminal justice system. Early adults make up 40% of the incarceration population and comprise a significant portion of all types of arrests (FBI, 2016). Considering the large portion of the justice population that is in the early adulthood age range, it is essential to understand the needs of this age group in order to successfully reduce high rates of recidivism, re-incarceration and poor social and criminal justice outcomes. Paper one details a systematic review which explores the prevalence, measurement, and treatment of trauma among justice-involved populations. Although the intent was to include only articles with an average age in early adulthood, only one article met this criterion (Styron et al., 2006). As such, it was not possible to determine what treatments are being utilized specifically for early adults. However, the lack of focus on early adults magnifies the need for research focused on this population.

The systematic review synthesized the studies that have utilized a trauma-informed treatment program with the criminal justice-involved population. Findings indicate that few trauma-informed practices are being used with the goal of reducing criminal justice outcomes and only ten of the included articles measured a marker of recidivism post-intervention. Findings were mixed regarding the outcomes of the intervention programs. The review also outlined the use of assessment tools across intervention studies used to measure experience of traumatic events as well as presence of trauma symptoms. Seventeen tools were used across the studies to

measure trauma. The use of so many measurement tools highlights the inconsistences in discussions of trauma among justice-involved samples. Without consistent measurement, it is impossible to truly ascertain the amount of trauma that exists within the criminal justice system.

Paper two used administrative data from the North Carolina Department of Public Safety to examine differences of criminogenic risk and need among early adult probationers compared to older adults on probation. Early adults had higher levels of need across four of five criminogenic need areas: antisocial personality traits, antisocial values, dysfunctional family history, and self-control issues. Additionally, early adults experienced higher likelihood of receiving a probation violation, as well as higher numbers of violations than older adult probationers. The results also indicate that criminogenic need areas were elevated differently for males and females. Specifically, early adult females had higher needs related to self-control and dysfunctional family histories, whereas males reported higher needs in the areas of antisocial values and personality traits and substance use. This is consistent with previous research exploring the relationship between risk tools and recidivism by gender (Skeem, Monahan, & Lowenkamp, 2016). Skeem et al. (2016) found that tools worked equally as well for females as males in the sample, but that certain key constructs may be missing from assessment tools that add to the validity of assessment for females. Similarly, other studies have found that certain constructs manifest differently for women (Coid et al., 2009; Holsinger, Lowenkamp, & Latessa, 2003). Moreover, probationers with mental health related symptoms experienced higher levels of need across all measured risk areas, indicating a need for more criminogenic programs responsive to mental health needs.

The final paper focused on the experience of traumatic life stressors of probationers involved in a larger randomized control trial of Specialty Mental Health Probation. This study

focused on the amount and types of trauma probationers with severe and persistent mental illnesses have experienced. The sample included a total of 127 individuals and only five (4%) participants in the study had not experienced any traumatic event during their lifetime. There were no statistically significant differences between early adults and older adults in the amount of trauma experienced, indicating probationers are experiencing trauma early in their lifetimes. Females had experienced more interpersonal traumatic events than male probationers, and individuals who had been on probation previously experienced higher levels of trauma. These findings suggest that trauma is prevalent among individuals on probation and could contribute to continued justice involvement.

Strengths and Limitations

Strengths. This dissertation is one of the first to provide an in-depth exploration of the experiences of early adults involved in the criminal justice system. These three dissertation papers provide a broad range of methodologies to explore this phenomenon. First, through the systematic review, this dissertation synthesizes information in a new way. The focus on early adults and trauma-informed practices contributes to the literature on a substantial portion of criminal justice-involved individuals. This systematic review will allow a clear, concise picture of current justice practices related to trauma. The review pulls articles from many databases, which provides a more thorough effort to obtain all published materials.

The second dissertation paper investigates criminogenic risk and need in a way previously unexplored. No literature to date on measurement of criminogenic risk and need focuses on age groups and the level of risk and need among different age cohorts. Though adults are similar in many ways, nuances of growth and development occur early in adulthood that could contribute to understanding of criminal behavior during this developmental period. As this

paper has demonstrated, early adults do have higher levels of criminogenic risk and need and these differences are nuanced by gender as well as mental health symptomology. Considering the findings in paper 2, criminal justice research would benefit from exploring in more depth the unique criminogenic risk and need, and the association with criminal behaviors, among this high-risk early adult age group.

Paper three focuses on the traumatic experiences of probationers with serious mental illnesses. Little research exists on cumulative trauma among justice-involved populations, especially those with mental illness, and paper three provides a foundational assessment of what level of trauma is experienced among this group. Additionally, virtually no literature exists identifying the role trauma plays in early adults' offending behavior. The sample in paper three has a verified mental health diagnosis based on a standardized diagnostic tool and uses a standardized instrument to measure traumatic experiences. By both diagnosing PTSD, and identifying experiences of specific traumatic events, this research is able to provide a detailed analysis of the extent to which trauma is present, and what types of trauma are present among a vulnerable, high-need subset of justice-involved individuals.

Limitations. Although this dissertation provides enlightening information for the field, limitations exist within the studies. First, the systematic review is limited to published articles. The lack of inclusion of the grey literature could inadvertently exclude trauma-informed practices being used with early adults in the correctional system. By not including unpublished articles, publication bias occurs which could skew the findings and conclusions drawn from the studies included in the review.

A second limitation of the dissertation is the use of administrative data from one state. This limits the generalizability of the results from a representative standpoint as well as from the

measurement tools. First, though the data include all probationers for one year, it is possible that probationers in North Carolina vary significantly from probationers in other states. Additionally, the measures of criminogenic risk and need are specific to North Carolina DPS. Though the measures are adequate and have demonstrated the ability to correlate with violation presence, they are limited in scope. These measures may not be applicable to other samples. Further, not all eight criminogenic risk areas included in the RNR model (Bonta & Andrews, 2007) are measured in the data. The lack of all areas included in analyses creates an incomplete picture of risk factors and needs for these probationers. It is likely that other variables need to be included in the tested models and would strengthen the connection between criminogenic risk and need and receiving a probation violation.

The final paper is also limited in its ability to provide findings that are generalizable to a broad audience. This study uses a small sample of individuals from six counties in one state. The sample is further limited due to solely including individuals with severe or persistent mental illnesses. Though this is a vital population to represent in research, the limitations of such sampling techniques include inability to identify how the findings may apply to other samples. Additionally, the measure of trauma solely focuses on exposure to life stressor events and does not include any marker of symptomology related to the traumatic event. It is clear that a significant number of participants had experienced at least one event, though this does not explain how the event affected the participants.

Implications

Taken together these three papers provide insight into the experiences of early adults involved in the criminal justice system. Early adulthood is a vital developmental period in which many major milestones are achieved (Arnett, 2007), however, justice involvement impedes early

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adults' ability to navigate these major life changes on par with their peers. Early adults provide

an opportunity for programming aimed to reach a large portion of the justice-involved

population, as well as opportunities to address untreated trauma among justice-involved

populations. Considering the elevated level of criminogenic risk and need, as well as high rates

of trauma, it is imperative that criminal justice practice, policy, and research explore the depth of

these factors among early adult justice-involved individuals.

Measurement and treatment of trauma. Clearly, trauma is over-represented in criminal

justice populations compared to the general population (Donley et al., 2012; Goff et al., 2007).

The high rates of trauma necessitate measurement and treatment as part of routine criminal

justice practices. Individuals entering the criminal justice system should be evaluated to identify

their level of exposure to trauma, as well as current symptoms related to trauma. However,

measurement tools vary in the trauma constructs they measure (SAMHSA, 2014), thus creating

complications in the ability to identify consistent patterns of trauma across justice-involved

populations. One way to overcome this challenge, is for the criminal justice system to implement

standardized measurement of trauma-related experiences and symptoms. Instituting a policy to

measure trauma in a consistent way would allow for a clearer picture of what trauma is

experienced and the extent to which is present within criminal justice populations.

By assessing for trauma early, programming can address the trauma in order to minimize

the deleterious effects it may have on behavior and engagement in crime. Programs exist that

have been shown to be effective with addressing trauma among justice populations. As such,

these programs can be implemented when necessary to assist in reducing the effects of trauma.

Though the articles reviewed in this dissertation do not draw direct causal links between trauma-

informed practices and recidivism, participants who received treatment did have lower rates of

subsequent criminal justice outcomes than those who did not receive the trauma-informed treatment. At the very least these programs were able to reduce symptoms of trauma and delay criminal behavior, as such, serious consideration should be made to include trauma-informed practices for individuals who would benefit from such treatment.

Criminogenic risk and need. The study contributes to the evidence for measuring criminogenic risk areas in order to provide targeted programming to reduce criminal justice involvement. Paper two demonstrated that the measures of criminogenic risk and need were in fact related to the presence of a violation. Thus, indicating having an assessment of these areas is an important aspect of successful probation supervision. By assessing the criminogenic risk areas, DPS is better able to identify who may need the most intense services. Identifying these individuals is an important step in being able to determine how to refer clients to appropriate services. Ultimately, this process of measuring risk and referral to services can decrease the number of individuals under correctional supervision.

It is especially important to measure these criminogenic risk factors for early adults. As was evident throughout all the analyses, early adults experienced higher levels of risk and need across almost all domains. Since they are early in their lifespan, it is important to implement effective ways for them to successfully disengage from the criminal justice system. Consideration should be made for the heightened factors of early adults that could contribute to crime, such as impulsivity and poor reasoning (Bloom, 1999; Bonta & Andrews, 2007) when designing supervision plans for this age group.

Overall, this study provides evidence for the need for in-depth assessment of both traumatic experiences and criminogenic risk factors for all justice-involved populations, but especially for early adults. The intersection between age, traumatic experience, criminogenic

risk, and recidivism is a fundamental piece in understanding and alleviate justice involvement for a substantial portion of the criminal justice population. Results demonstrate the link between these areas (i.e., age, trauma, criminogenic risk) and point to a need for policies and practices within the criminal justice system that incorporate trauma as well as criminogenic needs. Future research should use broader samples to study the link between age and criminogenic risk and need as well as identify trauma-informed practices that are especially effective for early adults.

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